

Attachment B

GWAC Work Plan

I. Introduction

The following work plan will help guide the Lower Yakima Valley Groundwater Advisory Committee's (GWAC) development of the Lower Yakima Valley GWMA Program over the next several years. It outlines the general steps the GWAC will take to develop the GWMA Program, establishes anticipated time frames for conducting the work, and identifies a range of costs for creating the GWMA Program.

Yakima County, as the GWMA lead agency, is responsible for preparing the work plan, schedule and budget for the development of the program that shows the responsibilities and roles of each of the advisory committee members as agreed upon by the committee (WAC 173-100-080 Lead Agency Responsibilities). The GWAC is responsible for overseeing the development of a program; it is also responsible for reviewing the work plan, schedule and budget. (WAC 173-100-080-Groundwater Advisory Committee)

In accordance with its statutory responsibilities and with the oversight of the GWAC, Yakima County created this work plan for the GWAC's approval. It is based on the best available information as of this writing; as such, it is anticipated that the plan will undergo revisions by the GWAC as it moves forward in its work.

In addition, while the work plan reflects the goals established in Yakima County's *Request for Identification Lower Yakima Valley Groundwater Management Area* (June 2011), the committee will be developing specific goals and objectives for the GWMA to be included in the Groundwater Management Program. The goals and objectives from the "Request" are as follows:

GOALS AND OBJECTIVES

The GWMA will be a multi-agency, citizen-based, coordinated effort to reduce groundwater nitrate contamination in the lower Yakima Valley. It will receive input from people affected or interested in the problems and solutions and will coordinate their energies toward action. It will work to achieve credibility with the general public and the farming community.

GWMA GOAL

The primary long-term goal of the GWMA is to reduce concentrations of nitrate in groundwater to below Washington State drinking water standards.

PROPOSED OBJECTIVES

Objectives have been divided into six categories: Data and Monitoring, Problem Identification, Measures to Reduce Groundwater Contamination, Education, Drinking Water Systems, and General objectives.

Input from the GWAC and citizen input will be used to refine and prioritize objectives. In general, refinement of objectives in each category will begin with an updated assessment of the current status of work.

DATA AND MONITORING

- Collect and incorporate existing nitrate and nitrogen data into a shared data management system or data sharing site to improve understanding of the sources and extent of contamination.
- Establish a monitoring program to identify sources of nitrate contamination and their relative importance.
- Establish and conduct long-term groundwater quality monitoring program and evaluate progress.

PROBLEM IDENTIFICATION

- Characterize the nature and extent of nitrate concentrations in Lower Yakima Valley groundwater.
- Identify and rank the sources of elevated nitrate in groundwater, with site-specific characteristics developed for "hot spots" as appropriate.
- Identify and describe activities contributing to groundwater contamination based on scientific data and evaluation. Scientific and other data will be shared among the partners to facilitate development of effective programs and strategies.

MEASURES TO REDUCE GROUNDWATER CONTAMINATION

- Develop effective and coordinated best management practices (BMPs) to address specific nitrate sources.
- Develop strategies for implementing best management practices such as technical assistance, education, ordinances and coordination with other regulatory and nonregulatory programs.
- Support enforcement of new and existing laws and ordinances.

EDUCATION

- Establish educational programs to promote the protection of groundwater quality and provide a forum for stakeholders to discuss nitrate reduction methods and improvement of groundwater quality. This will include culturally-appropriate education and outreach.
- Establish a clearinghouse for pertinent public health, environmental, and business information.

- Educate private well owners on water quality testing methods, frequencies, interpretation of results, and funding sources.

DRINKING WATER SYSTEMS

- Provide water quality and hydrogeologic data to assess needs and methods of expanding public water supplies, and provide a forum for initiation of these plans.
- Consider options to encourage appropriate expansion of public water supplies to areas that are currently dealing with contaminated private supplies.
- Assist residents whose supplies have been contaminated to access safe and reliable water supplies, using culturally-appropriate communications.

GENERAL

- Pollution prevention will be a guiding principle for all work done by the GWMA.
- Participation by the Yakama Nation will be requested and encouraged in a way that is consistent with their sovereignty.
- Participating agencies will maintain their regulatory authority using their own discretion as appropriate. They will also seek opportunities to coordinate actions and address regulatory gaps.
- The GWMA will seek sustainable funding sources to carry out its mission.

II. GWMA Work Plan Contents and Timelines

The GWAC has organized itself into seven Work Groups: Data Collection, Characterization, and Monitoring; Livestock and CAFO; Irrigated Agriculture; Residential, Commercial, Industrial, Municipal and Domestic; Regulatory Framework; Education and Outreach; and Funding. The work plan has been developed and organized with regards to the work each Work Group will be undertaking.

The GWMA Program will accumulate existing available data and information and generate additional data specific to Lower Yakima Valley groundwater quality and the future management of contributing sources. Information and data provided include identification of probable contaminant sources, studies on contributing local factors including soil profiles, nutrient and water application rates, surficial aquifer hydrology, local and locally applicable management practices established elsewhere, priorities for data collection to fill information gaps, and funding requirements and potentials. The GWMA will identify additional data networks and provide for implementation of short term and long term Best Management Practices (BMPs) to improve groundwater quality that can be prioritized dependent on continuing data collection. Also, the GWMA Program will recommend general activities and specific tasks to be conducted by involved agencies and GWAC Working Groups.

One of the first steps to be undertaken by the GWAC is to identify or determine the extent of the problem. This step will require collecting the available data to identify the information gaps on a priority basis. The GWMA will identify potential sources of nitrate pollution from potential legacy sources where possible and from irrigated agriculture, livestock including large-scale commercial livestock operation, e.g., confined animal feeding operations (CAFO) and point and non-point sources of nitrate groundwater contamination from other sources including residential, commercial, industrial, municipal and domestic runoff.

The GWMA work plan content and the various activities are as follows:

Work Plan Content

1.0 Data Collection, Characterization, Monitoring

1.1 Compile and Manage Data

- a. Research and compile existing data
- b. Analyze existing data
- c. Create a shared data management system
- d. Create a GIS application
- e. Identify data needs (Gaps) working with other GWAC Work Groups
- f. Report to GWAC for input/feedback
- g. Incorporate GWAC comments and finalize report

1.2 Update Existing Hydrogeologic Characterization Report (February 2010)

- a. Delineation of groundwater area (A delineation of the groundwater area, subarea or depth zone boundaries and the rationale for those boundaries)
- b. Jurisdictional boundaries (A map showing the jurisdictional boundaries of all state, local, tribal, and federal governments within the groundwater management area)
- c. Land and water use authorities and responsibilities (Land and water use management authorities, policies, goals and responsibilities of state, local, tribal, and federal governments that may affect the area's groundwater quality and quantity)
- d. Description of the area (A general description of the locale, including a brief description of the topography, geology, climate, population, land use, water use and water resources)
- e. Hydrogeology (A description of the area's hydrogeology, including the delineation of aquifers, aquitards, hydrogeologic cross-sections, porosity and horizontal and vertical permeability estimates, direction and quantity of groundwater flow, water-table contour and potentiometric maps by aquifer, locations of wells, perennial streams and springs, the

locations of aquifer recharge and discharge areas, and the distribution and quantity of natural and man-induced aquifer recharge and discharge)

f. Historical and existing groundwater quality

g. Historical and current groundwater use and purpose (Estimates of the historical and current rates of groundwater use and purposes of such use within the area)

h. References and Documentation (References including sources of data, methods and accuracy of measurements, quality control used in data collection and measurement programs, and documentation for and construction details of any computer models used)

i. Develop an estimate of the existing and future aquifer uses (Projections of groundwater supply needs and rates of withdrawal based upon alternative population and land use projections)

j. Develop a summary of water quality standards set by DOE (Ecology) and EPA

k. Develop a report of annual variations in hydrogeologic factors (variations in aquifer recharge and other significant hydrogeologic factors)

l. Submit to GWAC for comments

m. Incorporate GWAC comments and submit to GWAC

1.3 Develop Implementation Work Plan - Develop a detailed work plan for implementing each aspect of the groundwater data collection and analysis programs

a. Identify monitoring locations

b. Select monitoring parameters and laboratory analytical methods

c. Determine sampling frequency and number

d. Document field procedures

e. Identify QA/QC procedures

f. Develop statistical monitoring procedure

g. Develop and submit funding request for additional research to GWAC

h. Apply for research funding before the application deadline (normally October)

i. Develop the final quarterly status report for GWAC

j. Present the final quarterly status report to GWAC for discussion and feedback

k. Incorporate GWAC comments. Re-evaluate recommendations

l. Finalize list of recommendations and submit the final quarterly status report to Ecology

1.4 Implementation - Begin collection of water quality data

- a. Identify the parties responsible for initiating the strategy
- b. Develop a schedule for implementing the strategy
- c. Develop a cost estimate for implementing the strategy
- d. Secure access to sampling locations
- e. Collect Samples

1.5 Monitoring - Develop a long-term monitoring system for evaluating the effectiveness of each strategy

1.6 Review - Develop a process for the periodic review and revision of the groundwater management program

1.7 Develop the GWMA Program Report (combine with other workgroups)

1.8 Submit Final Report (combine with other workgroups)

2.1 Livestock & CAFO - Yards, corrals, lagoons, and manure field application

2.1.1 Problem definition - Define the extent of the groundwater problems caused or potentially caused by each activity supported by as much documentation as possible including:

- a. Identify and categorize specific sources
- b. Define and quantify source contribution to groundwater problem
- c. Examine groundwater quality trends by cause
- d. Evaluate and predict likelihood of future problems and conflicts if no action is taken
- e. Identify areas where insufficient data exists to define the nature and extent of existing or potential groundwater nitrate contamination
- f. Develop a plan to obtain the data necessary to define the nature and extent of existing or potential groundwater nitrate contamination sources
- g. Identify areas where the sources of other forms of groundwater contamination, primarily bacteria, overlap with or are related to nitrate sources.
- h. Submit to GWAC for comments and feedback
- i. Incorporate GWAC comments and finalize draft

2.1.2 Water Quality Goals - To reduce the level of nitrates in groundwater to safe drinking water standards. This work group will contribute to the overall GWMA goal by greatly reducing or eliminating nitrate contamination that may be occurring as a result of current practices. This should result in a downward trend over time, especially at shallow depths, even though nitrate contamination persists from past practices.

- a. Develop quantifiable groundwater quality goals for each activity
- b. Develop a schedule for achieving the groundwater quality goals for each activity
- c. Provide WQ Goals to GWAC for discussion, feedback and consensus
- d. Incorporate GWAC comments and finalize WQ Goals

2.1.3 Identify and evaluate existing management strategies and programs (DNM Act, NPDES CAFO Permit, BMPs, etc.) for each specific source in terms of:

- a. Feasibility
- b. Effectiveness
- c. Cost
- d. Time
- e. Implementation Challenges
- f. Current level of implementation
- g. Monitoring
- h. Enforcement
- i. Consistency with Water Management Programs and Local Comprehensive Plans
- j. Effectiveness at also preventing related forms of contamination such as bacteria.
- k. Recommend changes for each strategy / program including, where possible, model ordinances, recommended governmental policy statements, interagency agreements, proposed legislative changes, and proposed amendments to local comprehensive plans, coordinated water system plans, basin management programs, and others as appropriate.
- l. Submit to GWAC for discussion, feedback and consensus
- m. Incorporate GWAC comments and finalize WQ Goals

2.1.4 Once sources of groundwater nitrate contamination are clearly defined identify and evaluate alternative management strategies / programs for each specific source in terms of:

- a. Feasibility

- b. Effectiveness
- c. Cost
- d. Time
- e. Implementation Challenges
- f. Monitoring
- g. Enforcement
- h. Consistency with Water Management Programs and Local Comprehensive Plans
- i. Effectiveness at also preventing related forms of contamination such as bacteria.
- j. A description of each strategy / program including, where possible, model ordinances, recommended governmental policy statements, interagency agreements, proposed legislative changes, and proposed amendments to local comprehensive plans, coordinated water system plans, basin management programs, and others as appropriate.
- k. Provide and discuss strategies and rationale of recommendations to GWAC
- l. Incorporate GWAC comments and submit to GWAC (combine with other workgroups)

2.1.5 Recommendations - Choose recommended management strategies from existing and alternative management strategies for implementation

- a. Provide the rationale for choosing recommended management strategies for implementation
- b. Provide the rationale for not choosing those management strategies not chosen for implementation
- c. Develop and submit funding request for additional research to GWAC
- d. Apply for research funding before the application deadline (normally October)
- e. Develop the final quarterly status report for GWAC
- f. Present the final quarterly status report to GWAC for discussion and feedback
- g. Incorporate GWAC comments. Re-evaluate recommendations
- h. Finalize list of recommendations and submit the final quarterly status report to Ecology

2.1.6 Implementation - Develop a detailed work plan for implementing each aspect of the groundwater management strategies / programs based on the Recommendations section.

- a. Identify the parties responsible for initiating the strategy.

- b. Develop a schedule for implementing the strategy
- c. Develop a cost estimate for implementing each strategy.
- d. Identify priority rankings
- e. Complete Implementation Plan and submit to GWAC and public for input/feedback
- f. Incorporate GWAC and finalize Implementation Plan

2.1.7 Monitoring - Develop a long-term monitoring system for evaluating the effectiveness of each strategy.

2.1.8 Review - Develop a process for the periodic review and revision of the groundwater management program

2.1.9 Develop the GWMA Program Report (combine with other workgroups)

2.1.10 Prepare Final Report (combine with other workgroups)

2.2 Irrigated Agriculture

2.2.1 Problem definition - Identify and categorize specific practices irrigated agricultural can implement to reduce nitrate loading to groundwater.

- a. Define and quantify source contributions (all sources) to groundwater problem (Note: This would entail developing a study area scale nitrogen budget estimate for all nitrogen sources)
- b. Identify and obtain existing water quality data sources.
- c. Identify areas where insufficient data exists to define the nature and extent of existing or potential groundwater problems
- d. Examine groundwater quality trends
- e. Submit to GWAC for comments
- f. Incorporate GWAC comments and finalize report

2.2.2 Water Quality Goals - Establish groundwater quality goals for each activity

- a. Develop quantifiable groundwater quality goals for each activity
- b. Develop a schedule for achieving the groundwater quality goals for each activity
- c. Submit to GWAC for comments
- d. Incorporate GWAC comments and finalize report

2.2.3 Identify and evaluate existing management strategies and programs (BMPs, , etc.) for each specific source in terms of:

- a. Feasibility
- b. Effectiveness
- c. Cost
- d. Time
- e. Implementation Challenges
- f. Current level of implementation
- g. Monitoring
- h. Education (Change Enforcement?)
- i. Consistency with Water Management Programs and Local Comprehensive Plans
- j. Recommend changes for each strategy / program
- k. Submit to GWAC for comments
- l. Incorporate GWAC comments and finalize report

2.2.4 Identify and evaluate alternative management strategies / programs for each specific source in terms of:

- a. Feasibility
- b. Effectiveness
- c. Cost
- d. Time
- e. Implementation Challenges
- f. Current level of implementation
- g. Monitoring
- h. Education (change Enforcement?)
- i. Consistency with Water Management Programs and Local Comprehensive Plans
- j. Recommend changes for each strategy / program
- k. Submit to GWAC for comments

I. Incorporate GWAC comments and finalize report

2.2.5 Recommendations - Choose recommended management strategies from existing and alternative management strategies for implementation

- a. Provide the rationale for choosing recommended management strategies for implementation
- b. Provide the rationale for not choosing those management strategies not chosen for implementation
- c. Develop and submit funding request for additional research to GWAC
- d. Apply for research funding before the application deadline (normally October)
- e. Develop the final quarterly status report for GWAC
- f. Present the final quarterly status report to GWAC for discussion and feedback
- g. Incorporate GWAC comments. Re-evaluate recommendations
- h. Finalize list of recommendations and submit the final quarterly status report to Ecology

2.2.6 Implementation - Develop a detailed work plan for implementing each aspect of the groundwater management strategies / programs based on the Recommendations section.

- a. Identify the parties responsible for initiating the strategy.
- b. Develop a schedule for implementing the strategy
- c. Develop a cost estimate for implementing each strategy.
- d. Identify priority rankings
- e. Complete Implementation Plan and submit to GWAC and public for input/feedback
- f. Incorporate GWAC and finalize Implementation Plan

2.2.7 Monitoring - Develop a long-term monitoring system for evaluating the effectiveness of each strategy.

2.2.8 Review - Develop a process for the periodic review and revision of the groundwater management program

2.2.9 Develop the GWMA Program Report (combine with other workgroups)

2.2.10 Prepare Final Report (combine with other workgroups)

2.3 Residential, Commercial, Industrial, Municipal and Domestic

2.3.1 Problem definition - Define the extent of the groundwater problems caused or potentially caused by residential, commercial, industrial, municipal and domestic developments supported by as much documentation as possible including:

- a. Identify and categorize specific and potential sources of pollutants. Define residential, commercial, industrial, municipal and domestic pollutant sources
- b. Determine and quantify source contribution to groundwater problem (include surface water sources). Examples include TMDL, UIC, industrial discharges, stormwater pollutants, biosolids, lagoons, pipe franchises, waste allocation, septic system, stormwater and wastewater outfalls, residential fertilizer, etc.
- c. Determine and quantify source contribution to groundwater from surface water
- d. Examine groundwater quality trends (include surface water pollutants) by cause
- e. Evaluate and predict likelihood of future problems and conflicts if no action is taken
- f. Identify areas where insufficient data (Data Gap) exists to define the nature and extent of existing or potential groundwater problems, e.g., improperly abandoned wells, poor well construction, failing septic system
- g. Prepare report and submit to GWAC for input/comments
- h. Incorporate GWAC comments and finalize report

2.3.2 Water Quality Goals - List or establish groundwater quality goals for each activity

- a. Develop quantifiable groundwater quality goals for each activity.
- b. Develop a schedule for achieving the groundwater quality goals for each activity
- c. Prepare report and submit to GWAC for input/comments
- d. Incorporate GWAC comments and finalize report

2.3.3 Identify and evaluate existing management strategies and programs for each specific source in terms of:

- a. Feasibility
- b. Effectiveness
- c. Cost
- d. Time
- e. Implementation Challenges
- f. Current level of implementation

- g. Monitoring
- h. Enforcement
- i. Consistency with Water Management Programs and Local Comprehensive Plans
- j. Recommend changes for each strategy / program
- k. Submit to GWAC for comments/input
- l. Incorporate GWAC comments and finalize report

2.3.4 Identify and evaluate alternative management strategies / programs for each specific source in terms of:

- a. Feasibility
- b. Effectiveness
- c. Cost
- d. Time
- e. Implementation Challenges
- f. Monitoring
- g. Enforcement
- h. Consistency with Water Management Programs and Local Comprehensive Plans
- i. A description of each strategy / program including, where possible, model ordinances, recommended governmental policy statements, interagency agreements, proposed legislative changes, and proposed amendments to local comprehensive plans, coordinated water system plans, basin management programs, and others as appropriate;
- j. Recommend changes for each strategy / program
- k. Submit to GWAC for comments/input
- l. Incorporate GWAC comments and finalize report

2.3.5 Recommendations - Choose recommended management strategies from existing and alternative management strategies for implementation

- a. Provide the rationale for choosing recommended management strategies for implementation
- b. Provide the rationale for not choosing those management strategies not chosen for implementation

- c. Develop and submit funding request for additional research to GWAC
- d. Apply for research funding before the application deadline (normally October)
- e. Develop the final quarterly status report for GWAC
- f. Present the final quarterly status report to GWAC for discussion and feedback
- g. Incorporate GWAC comments. Re-evaluate recommendations
- h. Finalize list of recommendations and submit the final quarterly status report to Ecology

2.3.6 Implementation - Develop a detailed work plan for implementing each aspect of the groundwater management strategies / programs based on the Recommendations section.

- a. Identify the parties responsible for initiating the strategy.
- b. Develop a schedule for implementing the strategy
- c. Communicate with responsible parties on strategy
- d. Develop a cost estimate for implementing each strategy.
- e. Identify priority rankings
- f. Complete Implementation Plan and submit to GWAC and public for input/feedback
- g. Incorporate GWAC and finalize Implementation Plan

2.3.7 Monitoring - Develop a long-term monitoring system for evaluating the effectiveness of each strategy.

2.3.8 Review - Develop a process for the periodic review and revision of the groundwater management program

2.3.9 Develop the GWMA Program Report (combine with other workgroups)

2.3.10 Prepare Final Report (combine with other workgroups)

3.0 Regulatory Framework

3.1 Problem Definition - Define Existing Regulatory Framework Within the GWMA Boundary - Identify existing laws, policies, goals, and responsibilities of state, local, tribal, and federal governments for each source or activity that may affect the area's groundwater quality.

3.2 Evaluate Existing Regulatory Framework - Research and understand all regulatory authority (who, what, when, why, how, etc.), who has the authority to monitor WQ, who is responsible for WQ enforcement (local, state, federal, tribe, districts)

- a. Feasibility

- b. Effectiveness
- c. Cost
- d. Time
- e. Implementation Challenges
- f. Current level of implementation
- g. Monitoring
- h. Enforcement
- i. Gap Determination and Analysis
- j. Overlaps
- k. Prepare preliminary report and submit to GWAC for input/comment
- l. Incorporate GWAC comments and finalize report

3.3 Work Group Support -Respond to Work Group needs and questions related to regulatory framework (Need to be able to answer questions brought up by any interest, e.g., who is responsible for nutrient management plan, inspection and enforcement water quality violations

- a. Provide information
- b. Answer questions
- c. Assist in identifying and evaluating alternative regulatory and/or non-regulatory strategies / programs
- d. Assist in evaluating and choosing for recommendation alternative regulatory and/or non-regulatory strategies / programs
- e. Assist in developing a description of each alternative strategy / program including, where possible, model ordinances, recommended governmental policy statements, interagency agreements, proposed legislative changes, and proposed amendments to local comprehensive plans, coordinated water system plans, basin management programs, and others as appropriate
- f. Prepare bilingual EPO materials, e.g., fact sheets, frequently asked questions, etc.
- g. Develop and implement Education and Public Outreach Plan

3.4 Submit the final quarterly status report to Ecology

3.5 Implementation - Develop a detailed work plan for implementing recommended alternative regulatory and/or non-regulatory strategies

- a. Identify the parties responsible for initiating the strategy.
- b. Develop a schedule for implementing the strategy
- c. Develop a cost estimate for implementing each strategy
- d. Develop a monitoring system for evaluating the effectiveness of each strategy

3.6 Monitoring - Develop a long-term monitoring system for evaluating the effectiveness of each strategy.

3.7 Review - Develop a process for the periodic review and revision of the groundwater management program

3.8 Develop the GWMA Program Report (combine with other workgroups)

3.9 Submit Final Report (combine with other workgroups)

4.0 Education and Outreach

4.1 Develop Goal Statement

- a. Communicate on-going GWAC/GWMA activities
- b. Communicate health effects of groundwater pollution
- c. Invite participation in the GWAC and GWMA activities
- d. Promote open process

4.2 Identify target audiences (Completed in 2012)

- a. Internal
- b. Policymakers and Legislative Staff
- c. Tribal
- d. General Public
- e. Underserved Population
- f. Special Interests

4.3 Identify information needs for each target audience considering: (Completed in 2012)

- a. Information needs and the reasons for that need
- b. Audience Demographics
- c. Communication Strengths and Constraints

d. Appropriate information delivery methodology

4.4 Compile and evaluate previous and existing education and outreach strategies (Completed in 2012)

- a. Review and evaluate effectiveness of previous education and outreach efforts
- b. Identify areas where previous strategies failed to reach targeted audiences, or did not produce desired outcomes
- c. Identify areas where existing audience-appropriate education and outreach materials and delivery are insufficient (materials and delivery gaps).

4.5 Create information delivery strategy(ies) tailored to targeted audiences

- a. Create audience-appropriate education and outreach materials and delivery methods to fill data gaps
- b. Select audience-appropriate education and outreach materials

4.6 Implementation - Develop a detailed work plan for implementing each aspect of the EPO strategy

- a. Identify the parties responsible for initiating the strategy.
- b. Develop a schedule for implementing the strategy (Completed in 2012)
- c. Develop a cost estimate for implementing each strategy.
- d. Determine how success (effectiveness) will be measured (Completed in 2012)
- e. Develop a monitoring system for evaluating the effectiveness of each strategy
- f. Develop a system for obtaining and incorporating GWAC updates, messages and materials into the strategy.
- g. Evaluate, update or change strategy(ies) based on their effectiveness

4.7 Develop & Implement a Web-based information system

- a. Identify communication needs best met using the web
- b. Identify target audiences who have web access
- c. Develop a web strategy that complements and reinforces the Public Outreach and Education Strategy; target audiences with web access
- d. Develop a time and cost estimate for implementation
- e. Update the current website to reflect the proposed strategy

- f. Monitor effectiveness of web strategy
- g. Evaluate, update and/or change strategy based on its effectiveness

4.8 Submit the final quarterly status report to Ecology

4.9 Develop the GWMA Program Report (combine with other workgroups)

4.10 Submit Final Report (combine with other workgroups)

5.0 Funding

5.1 Problem Definition - Determine funding short-term and long-term needs

- a. Data Collection, Characterization, Monitoring (DCCM)
- b. Livestock & CAFO - Yards, corrals, lagoons, manure field application
- c. Irrigated Agriculture
- d. Pollutants from Residential, Commercial, Industrial, Municipal and Domestic
- e. Regulatory Framework
- f. Education and Outreach
- g. Prepare and submit funding needs to GWAC
- h. Incorporate GWAC comments and prepare final report

5.2 Funding Strategy - Determine and develop short-term and long-term funding Strategy

- a. Data Collection, Characterization, Monitoring (DCCM)
- b. Livestock & CAFO - Yards, corrals, lagoons, manure field application
- c. Irrigated Agriculture
- d. Pollutants from Residential, Commercial, Industrial, Municipal and Domestic
- e. Regulatory Framework
- f. Education and Outreach
- g. Prepare and submit funding needs to GWAC
- h. Incorporate GWAC comments and prepare final report

5.3 Implementation - Seek and apply for all funding opportunities local, state, federal including private-public venture

- a. Seek and obtain private, local, state, federal and tribal financial assistance

b. Prepare and submit preliminary funding strategy status report to GWAC

c. Incorporate GWAC comments, finalize final grant report and submit to Ecology

5.4 Monitoring - Develop a long-term monitoring system for evaluating the effectiveness of each strategy and where to spend effort, time and funding

5.5 Review - Develop a plan and process for the periodic review of funding needs and where to obtain funding

5.6 Develop GWMA Program Report (combine with other workgroups)

5.7 Submit Final GWMA Program Report (combine with other workgroups)

An estimated schedule is presented in Appendix A1 and is expected to change as more information is gathered by the GWAC.

Strategies used by the GWAC may include, but not be limited to, the following:

- Compile recently established nitrate mitigation studies and BMPs from other similar studies including GWMAs
- Compile existing soil profile samples developed for nitrate uptake purposes and augment along with current research to determine nitrate level loading
- Perform deep soil samples to determine nitrate levels and extent of deep nitrate migration
- Provide in season sampling of plant tissue of soils to evaluate timing and application efficiency (the amount applied to the amount used by the crop)
- Identify geographic areas vulnerable to nitrate leaching (Leaching Vulnerability Index)
- Identify geographic areas of higher concern
- Identify sources of elevated nitrate levels
- Identify impacted aquifer or aquifer zones
- Provide GWMA baseline conditions and long term monitoring of same
- Estimate nutrient loading budget across the GWMA boundaries
- Identify information gaps and data acquisition needs

The GWMA Program will also recommend projects such as:

- A short term goal to provide clean drinking water to those with nitrate contamination and identify additional early adoption strategies

- Develop nutrient management guidelines (i.e., reduce the amount of nitrogen fertilizer through optimal timing, placement, and rate of fertilizer application) applicable to Lower Valley hydrology and soil conditions
- Develop irrigation water management guidelines specific to the land use (e.g., livestock, irrigated agriculture, domestic use)
- Develop bulk manure and fertilizer handling and storage guidelines
- Develop wellhead protection plans
- Facilitate implementation of nitrate management strategies specific to the farm local conditions
- Provide best management strategies for voluntary implementation

The GWMA Program will identify methods for evaluating the effectiveness of each strategy and methods for evaluating progress in implementing the projects. Quantitative measures are required to evaluate the baseline and progress and success of the action plan (downward nitrate trend for different sectors). Some of the potential specific goals used to guide implementation of nitrate management strategies are as follows:

1. Trends in nitrate levels and extent of deep nitrate migration
2. Trends in the adoption/implementation of BMPs
3. Trends in the level of public awareness of the causes and health implications of high nitrate levels in groundwater

III. Budget

In addition to the technical support from GWAC and external experts, funding is required to assist in the continued research, documentation, and identification of appropriate BMPs in the GWMA as well as data collection for projects such as deep soil sampling to evaluate changes in the amount and movement of nitrate during the GWMA Program development.

Description	Low	Medium	High
Task 1. Plan Development and Administration	\$300,000	\$400,000	\$500,000
Task 2. Monitoring and Characterization	\$150,000	\$575,000	\$1,000,000
Task 3. Education and Public Outreach	\$100,000	\$250,000	\$400,000
Task 4. BMP Redevelopment and Field Research	\$200,000	\$350,000	\$500,000
TOTAL	\$750,000	\$1,575,000	\$2,400,000

Budget Assumptions:

1. Low estimate is based on minimum effort and collection of existing data. This estimate was used to prepare the GWMA designation application. The GWAC may determine that additional data collection, field studies, monitoring and research are needed to define the extent of nitrate

contamination. The committee recognizes that additional funding will be needed (and sought) to accomplish the tasks identified in the budget, above the LOW level.

2. Medium estimate is the average of Low and High estimates
3. High estimate assumes significant data collection including drilling monitor wells, additional research and consultant costs.

IV. Immediate Public Health Needs

Approximately 75,000 persons reside within the Lower Yakima Basin area. Of that amount, it is estimated that about 25,000 residents (34% of the population) obtain their drinking water from private wells. Water quality testing conducted by various entities during the last twenty years shows that up to twenty percent of the private drinking water wells may exceed drinking water standards for nitrate. Accordingly, a conservative calculation indicates that upwards of 1,800 private wells within the area may exceed nitrate drinking water standards.

The GWAC recognizes and supports the primary long-term goal of the GWMA to reduce concentrations of nitrate in groundwater to below Washington State drinking water standards in order to protect the health and safety of the residents of the Lower Yakima Basin. The GWAC believes, based on similar efforts within the State of Washington and the Nation, that fulfillment of this goal will undoubtedly take many years to achieve. The GWAC is very concerned about the public health effects nitrates may have on the existing residents during this period of time. Accordingly, the GWAC will work with Federal, State, and Local governments to immediately seek funding and implement programs to provide clean drinking water to the residents of the Lower Yakima Basin.

Appendix A1

(Work Plan and Timeline)

1.0 Data Collection, Characterization, Monitoring (DCCM)			2013 - Q1			2013 - Q2			2013 - Q3			2013 - Q4			2014 - Q1			2014 - Q2			2014 - Q3			2014 - Q4			
Work Plan Content & Milestone			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
1.1 Compile and Manage Data																											
a. Research and compile existing data																											
b. Analyze existing data																											
c. Create a shared data management system																											
d. Create a GIS application																											
e. Identify data needs (Gaps) working with other GWAC Work Groups																											
f. Report to GWAC for input/feedback																											
g. Incorporate GWAC comments and finalize report																											
1.2 Update Existing Hydrogeological Characterization Report (February 2010)																											
a. Delineation of groundwater area (A delineation of the groundwater area, subarea or depth zone boundaries and the rationale for those boundaries)																											
b. Jurisdictional boundaries (A map showing the jurisdictional boundaries of all state, local, tribal, and federal governments within the groundwater management area)																											
c. Land and water use authorities and responsibilities (Land and water use management authorities, policies, goals and responsibilities of state, local, tribal, and federal governments that may affect the area's groundwater quality and quantity)																											
d. Description of the area (A general description of the locale, including a brief description of the topography, geology, climate, population, land use, water use and water resources)																											
e. Hydrogeology (A description of the area's hydrogeology, including the delineation of aquifers, aquitards, hydrogeologic cross-sections, porosity and horizontal and vertical permeability estimates, direction and quantity of groundwater flow, water-table contour and potentiometric maps by aquifer, locations of wells, perennial streams and springs, the locations of aquifer recharge and discharge areas, and the distribution and quantity of natural and man-induced aquifer recharge and discharge)																											
f. Historical and existing groundwater quality																											
g. Historical and current groundwater use and purpose (Estimates of the historical and current rates of groundwater use and purposes of such use within the area)																											
h. References and documentation (References including sources of data, methods and accuracy of measurements, quality control used in data collection and measurement programs, and documentation for and construction details of any computer models used)																											
i. Develop an estimate of the existing and future aquifer uses (Projections of groundwater supply needs and rates of withdrawal based upon alternative population and land use projections)																											
j. Develop a summary of water quality standards set by DOE (Ecology) and EPA																											
k. Develop a report of annual variations in hydrogeologic factors (variations in aquifer recharge and other significant hydrogeologic factors)																											
l. Submit to GWAC for comments																											
m. Incorporate GWAC comments and submit to GWAC																											
1.3 Develop Implementation Work Plan - Develop a detailed work plan for implementing each aspect of the groundwater data collection and analysis programs																											
a. Identify monitoring locations																											
b. Select monitoring parameters and laboratory analytical methods																											
c. Determine sampling frequency and number																											
d. Document field procedures																											
e. Identify QA/QC procedures																											
f. Develop statistical monitoring procedure																											
g. Develop and submit funding request for additional research to GWAC																											

1.0 Data Collection, Characterization, Monitoring (DCCM)		2013 - Q1			2013 - Q2			2013 - Q3			2013 - Q4			2014 - Q1			2014 - Q2			2014 - Q3			2014 - Q4					
		Work Plan Content & Milestone			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
h. Apply for research funding before the application deadline (normally October)																												
i. Develop the final quarterly status report for GWAC																												
j. Present the final quarterly status report to GWAC for discussion and feedback																												
k. Incorporate GWAC comments. Re-evaluate recommendations																												
l. Finalize list of recommendations and submit the final quarterly status report to Ecology																												
1.4 Implementation - Begin collection of water quality data																												
a. Identify the parties responsible for initiating the strategy																												
b. Develop a schedule for implementing the strategy																												
c. Develop a cost estimate for implementing the strategy																												
d. Secure access to sampling locations																												
e. Collect Samples																												
1.5 Monitoring - Develop a long-term monitoring system for evaluating the effectiveness of each strategy.																												
1.6 Review - Develop a process for the periodic review and revision of the groundwater management program																												
1.7 Develop the GWMA Program Report (combine with other workgroups)																												
1.8 Submit Final Report (combine with other workgroups)																												

2.1 Livestock & CAFO - Yards, corrals, lagoons, and manure field application		2013 - Q1	2013 - Q2			2013 - Q3			2013 - Q4			2014 - Q1			2014 - Q2			2014 - Q3			2014 - Q4				
Work Plan Content & Milestone		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2.1.1 Problem definition - Define the extent of the groundwater problems caused or potentially caused by each activity supported by as much documentation as possible including:																									
a. Identify and categorize specific sources																									
b. Define and quantify source contribution to groundwater problem																									
c. Examine groundwater quality trends by cause																									
d. Evaluate and predict likelihood of future problems and conflicts if no action is taken																									
e. Identify areas where insufficient data exists to define the nature and extent of existing or potential groundwater nitrate contamination																									
f. Develop a plan to obtain the data necessary to define the nature and extent of existing or potential groundwater nitrate contamination sources																									
g. Identify areas where the sources of other forms of groundwater contamination, primarily bacteria, overlap with or are related to nitrate sources.																									
h. Submit to GWAC for comments and feedback																									
i. Incorporate GWAC comments and finalize draft																									
2.1.2 Water Quality Goals - To reduce the level of nitrates in groundwater to safe drinking water standards. This work group will contribute to the overall GWMAs goal by greatly reducing or eliminating nitrate contamination that may be occurring as a result of current practices. This should result in a downward trend over time, especially at shallow depths, even though nitrate contamination persists from past practices.																									
a. Develop quantifiable groundwater quality goals for each activity																									
b. Develop a schedule for achieving the groundwater quality goals for each activity																									
c. Provide WQ Goals to GWAC for discussion, feedback and consensus																									
d. Incorporate GWAC comments and finalize WQ Goals																									
2.1.3 Identify and evaluate existing management strategies and programs (DNR Act, NPDES CAFO Permit, BMPs, etc.) for each specific source in terms of:																									
a. Feasibility																									
b. Effectiveness																									
c. Cost																									
d. Time																									
e. Implementation Challenges																									
f. Current level of implementation																									
g. Monitoring																									
h. Enforcement																									
i. Consistency with Water Management Programs and Local Comprehensive Plans																									
j. Effectiveness at also preventing related forms of contamination such as bacteria.																									
k. Recommend changes for each strategy / program including, where possible, model ordinances, recommended governmental policy statements, interagency agreements, proposed legislative changes, and proposed amendments to local comprehensive plans, coordinated water system plans, basin management programs, and others as appropriate.																									
l. Submit to GWAC for discussion, feedback and consensus																									
m. Incorporate GWAC comments and finalize WQ Goals																									
2.1.4 Once sources of groundwater nitrate contamination are clearly defined identify and evaluate alternative management strategies / programs for each specific source in terms of:																									
a. Feasibility																									
b. Effectiveness																									
c. Cost																									
d. Time																									
e. Implementation Challenges																									
f. Monitoring																									

2.1 Livestock & CAFO - Yards, corrals, lagoons, and manure field application		2013 - Q1	2013 - Q2		2013 - Q3		2013 - Q4		2014 - Q1		2014 - Q2		2014 - Q3		2014 - Q4										
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
g. Enforcement																									
h. Consistency with Water Management Programs and Local Comprehensive plans																									
i. Effectiveness at also preventing related forms of contamination such as bacteria.																									
j. A description of each strategy / program including, where possible, model ordinances, recommended governmental policy statements, interagency agreements, proposed legislative changes, and proposed amendments to local comprehensive plans, coordinated water system plans, basin management programs, and others as appropriate.																									
k. Provide and discuss strategies and rationale of recommendations to GWAC																									
l. Incorporate GWAC comments and submit to GWAC (combine with other workgroups)																									
2.1.5 Recommendations - Choose recommended management strategies from existing and alternative management strategies for implementation																									
a. Provide the rationale for choosing recommended management strategies for implementation																									
b. Provide the rationale for not choosing those management strategies not chosen for implementation																									
c. Develop and submit funding request for additional research to GWAC																									
d. Apply for research funding before the application deadline (normally October)																									
e. Develop the final quarterly status report for GWAC																									
f. Present the final quarterly status report to GWAC for discussion and feedback																									
g. Incorporate GWAC comments. Re-evaluate recommendations																									
h. Finalize list of recommendations and submit the final quarterly status report to Ecology																									
2.1.6 Implementation - Develop a detailed work plan for implementing each aspect of the groundwater management strategies / programs based on the Recommendations section.																									
a. Identify the parties responsible for initiating the strategy.																									
b. Develop a schedule for implementing the strategy																									
c. Develop a cost estimate for implementing each strategy																									
d. Identify priority rankings																									
e. Complete implementation plan and submit to GWAC and public for input/feedback																									
f. Incorporate GWAC and finalize implementation plan																									
2.1.7 Monitoring - Develop a long-term monitoring system for evaluating the effectiveness of each strategy.																									
2.1.8 Review - Develop a process for the periodic review and revision of the groundwater management program																									
2.1.9 Develop the GWMA Program Report (combine with other workgroups)																									
2.1.10 Prepare Final Report (combine with other workgroups)																									

2.2 Irrigated Agriculture		2013 - Q1	2013 - Q2	2013 - Q3	2013 - Q4	2014 - Q1	2014 - Q2	2014 - Q3	2014 - Q4																
Work Plan Content & Milestone		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2.2.1 Problem definition - Identify and categorize specific practices irrigated agriculture can implement to reduce nitrate loading to groundwater.																									
a. Define and quantify source contributions (all sources) to groundwater problem (Note: This would entail developing a study area scale nitrogen budget estimate for all nitrogen sources)																									
b. Identify and obtain existing water quality data sources.																									
c. Identify areas where insufficient data exists to define the nature and extent of existing or potential groundwater problems																									
d. Examine groundwater quality trends																									
e. Submit to GWAC for comments																									
f. Incorporate GWAC comments and finalize report																									
2.2.2 Water Quality Goals - Establish groundwater quality goals for each activity																									
a. Develop quantifiable groundwater quality goals for each activity																									
b. Develop a schedule for achieving the groundwater quality goals for each activity																									
c. Submit to GWAC for comments																									
d. Incorporate GWAC comments and finalize report																									
2.2.3 Identify and evaluate existing management strategies and programs (BMPs, , etc.) for each specific source in terms of:																									
a. Feasibility																									
b. Effectiveness																									
c. Cost																									
d. Time																									
e. Implementation Challenges																									
f. Current level of implementation																									
g. Monitoring																									
h. Education (Change Enforcement?)																									
i. Consistency with Water Management Programs and Local Comprehensive Plans																									
j. Recommend changes for each strategy / program																									
k. Submit to GWAC for comments																									
l. Incorporate GWAC comments and finalize report																									
2.2.4 Identify and evaluate <u>alternative</u> management strategies / programs for each specific source in terms of:																									
a. Feasibility																									
b. Effectiveness																									
c. Cost																									
d. Time																									
e. Implementation Challenges																									
f. Current level of implementation																									
g. Monitoring																									
h. Education (Change Enforcement?)																									
i. Consistency with Water Management Programs and Local Comprehensive Plans																									
j. Recommend changes for each strategy / program																									
k. Submit to GWAC for comments																									
l. Incorporate GWAC comments and finalize report																									
2.2.5 Recommendations - Choose recommended management strategies from existing and alternative management strategies for implementation																									

2.2 Irrigated Agriculture		2013 - Q1			2013 - Q2			2013 - Q3			2013 - Q4			2014 - Q1			2014 - Q2			2014 - Q3			2014 - Q4			
Work Plan Content & Milestone		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
a. Provide the rationale for choosing recommended management strategies for implementation																										
b. Provide the rationale for not choosing those management strategies not chosen for implementation																										
c. Develop and submit funding request for additional research to GWAC																										
d. Apply for research funding before the application deadline (normally October)																										
e. Develop the final quarterly status report for GWAC																										
f. Present the final quarterly status report to GWAC for discussion and feedback																										
g. Incorporate GWAC comments. Re-evaluate recommendations																										
h. Finalize list of recommendations and submit the final quarterly status report to Ecology																										
2.2.6 Implementation - Develop a detailed work plan for implementing each aspect of the groundwater management strategies / programs based on the Recommendations section.																										
a. Identify the parties responsible for initiating the strategy.																										
b. Develop a schedule for implementing the strategy																										
c. Develop a cost estimate for implementing each strategy.																										
d. Identify priority rankings																										
e. Complete Implementation Plan and submit to GWAC and public for input/feedback																										
2.2.7 Monitoring - Develop a long-term monitoring system for evaluating the effectiveness of each strategy.																										
2.2.8 Review - Develop a process for the periodic review and revision of the groundwater management program																										
2.2.9 Develop the GWMA Program Report (combine with other workgroups)																										
2.2.10 Prepare Final Report (combine with other workgroups)																										

2.3 Pollutants from Residential, Commercial, Industrial, Municipal and Domestic		2013 - Q1			2013 - Q2			2013 - Q3			2013 - Q4			2014 - Q1			2014 - Q2			2014 - Q3			2014 - Q4			
Work Plan Content & Milestone		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
2.3.1 Problem definition - Define the extent of the groundwater problems caused or potentially caused by residential, commercial, industrial, municipal and domestic developments supported by as much documentation as possible including:																										
a. Identify and categorize specific and potential sources of pollutants. Define residential, commercial, industrial, municipal and domestic pollutant sources																										
b. Determine and quantify source contribution to groundwater problem (include surface water sources). Examples include TMDL, UIC, industrial discharges, stormwater pollutants, biosolids, lagoons, pipe franchises, waste allocation, septic system, stormwater and wastewater outfalls, residential fertilizer, etc.																										
c. Determine and quantify source contribution to groundwater from surface water																										
d. Examine groundwater quality trends (include surface water pollutants) by cause																										
e. Evaluate and predict likelihood of future problems and conflicts if no action is taken																										
f. Identify areas where insufficient data (Data Gap) exists to define the nature and extent of existing or potential groundwater problems, e.g., improperly abandoned wells, poor well construction, failing septic system																										
g. Prepare report and submit to GWAC for input/comments																										
h. Incorporate GWAC comments and finalize report																										
2.3.2 Water Quality Goals - List or establish groundwater quality goals for each activity																										
a. Develop quantifiable groundwater quality goals for each activity																										
b. Develop a schedule for achieving the groundwater quality goals for each activity																										
c. Prepare report and submit to GWAC for input/comments																										
d. Incorporate GWAC comments and finalize report																										
2.3.3 Identify and evaluate existing management strategies and programs for each specific source in terms of:																										
a. Feasibility																										
b. Effectiveness																										
c. Cost																										
d. Time																										
e. Implementation Challenges																										
f. Current level of implementation																										
g. Monitoring																										
h. Enforcement																										
i. Consistency with Water Management Programs and Local Comprehensive Plans																										
j. Recommend changes for each strategy / program																										
k. Submit to GWAC for comments/input																										
l. Incorporate GWAC comments and finalize report																										
2.3.4 Identify and evaluate alternative management strategies / programs for each specific source in terms of:																										
a. Feasibility																										
b. Effectiveness																										
c. Cost																										
d. Time																										
e. Implementation Challenges																										
f. Monitoring																										
g. Enforcement																										

2.3 Pollutants from Residential, Commercial, Industrial, Municipal and Domestic		2013 - Q1	2013 - Q2		2013 - Q3		2013 - Q4		2014 - Q1		2014 - Q2		2014 - Q3		2014 - Q4										
Work Plan Content & Milestone		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
h. Consistency with Water Management Programs and Local Comprehensive plans																									
i. A description of each strategy / program including, where possible, model ordinances, recommended governmental policy statements, interagency agreements, proposed legislative changes, and proposed amendments to local comprehensive plans, coordinated water system plans, basin management programs, and others as appropriate;																									
j. Recommend changes for each strategy / program																									
k. Submit to GWAC for comments/input																									
l. Incorporate GWAC comments and finalize report																									
2.3.5 Recommendations - Choose recommended management strategies from existing and alternative management strategies for implementation																									
a. Provide the rationale for choosing recommended management strategies for implementation																									
b. Provide the rationale for not choosing those management strategies not chosen for implementation																									
c. Develop and submit funding request for additional research to GWAC																									
d. Apply for research funding before the application deadline (normally October)																									
e. Develop the final quarterly status report for GWAC																									
f. Present the final quarterly status report to GWAC for discussion and feedback																									
g. Incorporate GWAC comments. Re-evaluate recommendations																									
h. Finalize list of recommendations and submit the final quarterly status report to Ecology																									
2.3.6 Implementation - Develop a detailed work plan for implementing each aspect of the groundwater management strategies / programs based on the Recommendations section.																									
a. Identify the parties responsible for initiating the strategy																									
b. Develop a schedule for implementing the strategy																									
c. Communicate with responsible parties on strategy																									
d. Develop a cost estimate for implementing each strategy.																									
e. Identify priority rankings																									
f. Complete Implementation Plan and submit to GWAC and public for input/feedback																									
g. Incorporate GWAC and finalize Implementation Plan																									
2.3.7 Monitoring - Develop a long-term monitoring system for evaluating the effectiveness of each strategy.																									
2.3.8 Review - Develop a process for the periodic review and revision of the groundwater management program																									
2.3.9 Develop the GWMA Program Report (combine with other workgroups)																									
2.3.10 Prepare Final Report (combine with other workgroups)																									

3.0 Regulatory Framework			2013 - Q1			2013 - Q2			2013 - Q3			2013 - Q4			2014 - Q1			2014 - Q2			2014 - Q3					
Work Plan Content & Milestone			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.1 Problem Definition - Define Existing Regulatory Framework Within the GWMIA Boundary - Identify existing laws, policies, goals, and responsibilities of state, local, tribal, and federal governments for each source or activity that may affect the area's groundwater quality.																										
3.2 Evaluate Existing Regulatory Framework - Research and understand all regulatory authority (who, what, when, why, how, etc.), who has the authority to monitor WQ, who is responsible for WQ enforcement (local, state, federal, tribe, districts)																										
a. Feasibility																										
b. Effectiveness																										
c. Cost																										
d. Time																										
e. Implementation Challenges																										
f. Current level of implementation																										
g. Monitoring																										
h. Enforcement																										
i. Gap Determination and Analysis																										
j. Overlaps																										
k. Prepare preliminary report and submit to GWAC for input/comment																										
l. Incorporate GWAC comments and finalize report																										
3.3 Work Group Support - Respond to Work Group needs and questions related to regulatory framework (Need to be able to answer questions brought up by any interest, e.g., who is responsible for nutrient management plan, inspection and enforcement water quality violations																										
a. Provide Information																										
b. Answer Questions																										
c. Assist in identifying and evaluating alternative regulatory and/or non-regulatory strategies / programs																										
d. Assist in evaluating and choosing for recommendation alternative regulatory and/or non-regulatory strategies / programs																										
e. Assist in developing a description of each alternative strategy / program including, where possible, model ordinances, recommended governmental policy statements, interagency agreements, proposed legislative changes, and proposed amendments to local comprehensive plans, coordinated water system plans, basin management programs, and others as appropriate																										
f. Prepare bilingual EPO materials, e.g., Fact Sheets, Frequently Asked Questions, etc.																										
g. Develop and implement Education and Public Outreach Plan																										
3.4 Submit the final quarterly status report to Ecology																										
3.5 Implementation - Develop a detailed work plan for implementing recommended alternative regulatory and/or non-regulatory strategies																										
a. Identify the parties responsible for initiating the strategy.																										
b. Develop a schedule for implementing the strategy																										
c. Develop a cost estimate for implementing each strategy.																										
d. Develop a monitoring system for evaluating the effectiveness of each strategy.																										
3.6 Monitoring - Develop a long-term monitoring system for evaluating the effectiveness of each strategy.																										

3.0 Regulatory Framework		2013 - Q1			2013 - Q2			2013 - Q3			2013 - Q4			2014 - Q1			2014 - Q2			2014 - Q3			2014 - Q4		
Work Plan Content & Milestone		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.7 Review - Develop a process for the periodic review and revision of the groundwater management program																									
3.8 Develop the GWMA Program Report (combine with other workgroups)																									
3.9 Submit Final Report (combine with other workgroups)																									

4.0 Education and Outreach		2013 - Q1	2013 - Q2	2013 - Q3	2013 - Q4	2014 - Q1	2014 - Q2	2014 - Q3	2014 - Q4																
Work Plan Content & Milestone		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
4.1 Develop Goal Statement																									
a. Communicate on-going GWAC/GWMA activities																									
b. Communicate health effects of groundwater pollution																									
c. Invite participation in the GWAC and GWMA activities																									
d. Promote open process																									
4.2 Identify target audiences (Completed 2012)																									
a. Internal																									
b. Policymakers and Legislative Staff																									
c. Tribal																									
d. General Public																									
e. Underserved Population																									
f. Special Interests																									
4.3 Identify information needs for each target audience considering: (Completed in 2012)																									
a. Information needs and the reasons for that need																									
b. Audience Demographics																									
c. Communication Strengths and Constraints																									
d. Appropriate information delivery methodology																									
4.4 Compile and evaluate previous and existing education and outreach strategies (Completed in 2012)																									
a. Review and evaluate effectiveness of previous education and outreach efforts																									
b. Identify areas where previous strategies failed to reach targeted audiences, or did not produce desired outcomes																									
c. Identify areas where existing audience-appropriate education and outreach materials and delivery are insufficient (materials and delivery gaps).																									
4.5 Create information delivery strategy(ies) tailored to targeted audiences																									
a. Create audience-appropriate education and outreach materials and delivery methods to fill data gaps																									
b. Select audience-appropriate education and outreach materials																									
4.6 Implementation - Develop a detailed work plan for implementing each aspect of the EPO strategy																									
a. Identify the parties responsible for initiating the strategy.																									
b. Develop a schedule for implementing the strategy (Completed in 2012)																									
c. Develop a cost estimate for implementing each strategy.																									
d. Determine how success (effectiveness) will be measured (Completed in 2012)																									
e. Develop a monitoring system for evaluating the effectiveness of each strategy																									
f. Develop a system for obtaining and incorporating GWAC updates, messages and materials into the strategy.																									
g. Evaluate, update or change strategy(ies) based on their effectiveness																									
4.7 Develop & Implement a Web-based information system																									
a. Identify communication needs best met using the web																									
b. Identify target audiences who have web access																									

4.0 Education and Outreach		2013 - Q1			2013 - Q2			2013 - Q3			2013 - Q4			2014 - Q1			2014 - Q2			2014 - Q3			2014 - Q4		
Work Plan Content & Milestone		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
c. Develop a web strategy that complements and reinforces the Public Outreach and Education Strategy; target audiences with web access																									
d. Develop a time and cost estimate for implementation																									
e. Update the current website to reflect the proposed strategy																									
f. Monitor effectiveness of web strategy																									
g. Evaluate, update and/or change strategy based on its effectiveness																									
4.8 Submit the final quarterly status report to Ecology																									
4.9 Develop the GWMA Program Report (combine with other workgroups)																									
4.10 Submit Final Report (combine with other workgroups)																									

5.0 Funding		2013 - Q1			2013 - Q2			2013 - Q3			2013 - Q4			2014 - Q1			2014 - Q2			2014 - Q3			2014 - Q4				
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
5.1 Problem Definition - Determine funding short-term and long-term needs																											
a. Data Collection, Characterization, Monitoring (DCCM)																											
b. Livestock & CAFO - Yards, corrals, lagoons, manure field application																											
c. Irrigated Agriculture																											
d. Pollutants from Residential, Commercial, Industrial, Municipal and Domestic																											
e. Regulatory Framework																											
f. Education and Outreach																											
g. Prepare and submit funding needs to GWAC																											
h. Incorporate GWAC comments and prepare final report																											
5.2 Funding Strategy - Determine and develop short-term and long-term funding Strategy																											
a. Data Collection, Characterization, Monitoring (DCCM)																											
b. Livestock & CAFO - Yards, corrals, lagoons, manure field application																											
c. Irrigated Agriculture																											
d. Pollutants from Residential, Commercial, Industrial, Municipal and Domestic																											
e. Regulatory Framework																											
f. Education and Outreach																											
g. Prepare and submit funding needs to GWAC																											
h. Incorporate GWAC comments and prepare final report																											
5.3 Implementation - Seek and apply for all funding opportunities local, state, federal including private-public venture																											
a. Seek and obtain private, local, state, federal and tribal financial assistance																											
b. Prepare and submit preliminary funding strategy status report to GWAC																											
c. Incorporate GWAC comments, finalize final grant report and submit to Ecology																											
5.4 Monitoring - Develop a long-term monitoring system for evaluating the effectiveness of each strategy and where to spend effort, time and funding																											
5.5 Review - Develop a plan and process for the periodic review of funding needs and where to obtain funding																											
5.6 Develop GWMA Program Report (combine with other workgroups)																											
5.7 Submit Final GWMA Program Report (combine with other workgroups)																											

Appendix A2

Public Information & Outreach Two-Year Budget Options (Jan 2013 - Dec 2014)

LOW Budget Plan - \$100,000

- Conduct 4 public meetings with Spanish-language interpretation
- Develop and distribute English/Spanish informational materials to GWAC members and community groups
- Participate in periodic news shows on Public Spanish-language radio (KDWA)
- Distribute PSAs to commercial media (radio & TV)
- Maintain stakeholder & community contact list
- Maintain the GWMA website
- Conduct media relations including 4 news releases
- Conduct outreach at a minimum of 4 community events
- Solicit program feedback through the web, public meetings, and at community events

MID-Budget Plan - \$250,000

- Includes all features of the **LOW** plan and includes:
- Comprehensive distribution of English/Spanish materials to employers, businesses and others in the GWMA
- Send one direct-mail GWMA informational mailing to all households on private wells in the GWMA who are on a USPS mail route.
- Provide one door-to-door delivery of GWMA informational materials to households on private wells in the GWMA who are not on a USPS mail route.
- Provide periodic targeted Spanish-language outreach on commercial radio and television
- Solicit additional program feedback through comparison focus groups: two English & two Spanish-language focus group. (4 total)

HIGH-Budget Plan - \$400,000

- Includes all features of the **LOW & MID** plans and also:
- Hiring one bilingual FTE to manage the education & outreach effort
- Providing ongoing targeted Spanish-language outreach on commercial radio and television
- Soliciting additional program feedback through two or more English & Spanish-language focus groups (4 minimum); surveys, etc

Attachment C

Education and Outreach Plan

Introduction

The following outreach plan will help guide the Lower Yakima Valley Groundwater Advisory Committee (GWAC) carry out its public involvement efforts during the development of the GWMA program. The two-year outreach plan will educate audiences about the risk of nitrates in groundwater, invite participation in the GWAC's work, and solicit feedback in the GWMA development. It will also set the stage for future outreach efforts following implementation of the GWMA program.

The plan was developed by the GWAC's Education and Outreach (EPO) subcommittee, which was comprised of GWAC members, GWAC agency affiliates and citizen volunteers. The list is included as Appendix (A).

The subcommittee worked over several months to develop the strategy; key to this effort was ensuring that the plan will allow flexibility over the two years that the GWMA program itself is developed. That separate and concurrent effort will likely offer new data, program feedback and other variables that will require a dynamic and flexible outreach plan.

Following the subcommittee's creation of the draft plan, it was reviewed and approved by the GWAC committee on December 12, 2012.

GWAC and EPO Goals and Objectives

The Outreach Plan will support the GWAC's goal, *The purpose of the GWMA is to reduce nitrate contamination concentrations in groundwater below state drinking water standards.*

In addition, the EPO developed its own goal statement: *The GWMA Education and Public Outreach Plan will inform and educate the public about nitrate groundwater contamination and its health and environmental impacts, promote GWMA activities, and encourage engagement in the process by the community and key stakeholders.*

Overarching Objectives

The overarching objectives developed to carry out the plan goals include:

1. Educating at-risk audiences about the risks of elevated nitrate to human health and how to protect themselves from that risk;
2. Informing audiences about the GWAC planning process; and
3. Inviting participation in the development of the GWMA program

Target Audiences

The EPO plan will target four larger audiences, each with its own diverse audience subsets:

1. Internal audiences
 - a. Agency Leadership
 - b. Policymakers & Legislative Staff
 - c. Yakama Nation Leadership
2. General Public
 - a. Private well users and at risk-populations in the GWMA
 - b. Other residents within the GWMA
 - c. Media
3. Underserved/English as a Second Language Residents
 - a. Private well users and at-risk populations in the GWMA
 - b. Other residents within the GWMA
 - c. Spanish-Language Media
4. Special Interests
 - a. Large employers in the GWMA
 - b. Environmental & Ag Industry Associations
 - c. Social Justice Organizations

The detailed list of the target audiences is included as Appendix (B).

Strategy

The plan will address the specific needs of the diverse target audiences by responding to 1) the information and/or educational needs of each audience; 2) providing bilingual (English and Spanish) information and 3) using audience-specific outreach tools to convey key messages. This will be accomplished through a coordinated outreach campaign using a variety of English/Spanish outreach tools: a project website, interagency networking and coordination, print materials and mailings, local media, public events and festivals.

Underserved/English As a Second Language (ESL) Audiences

The EPO will directly reach out to the underserved and ESL audiences, especially those at high risk from nitrate contamination using targeted media and outreach work. Key "messengers" include Spanish language media, large employers, women's groups, the faith community, University of Washington Pacific Northwest Agricultural Safety and Health Center (PNASH), El Proyecto Bienestar, and others in the GWMA program area. They will be provided English/Spanish outreach materials and will be invited to spread the word about the program.

The EPO will seek outreach opportunities such as Cinco de Mayo festivals, Hispanic Awareness Month activities, Tribal Housing Summits, and local health care community events.

Yakama Nation and Spanish-language radio and TV will be invited to participate in outreach through public radio talk shows, PSA's and commercial ad spots.

Role of the GWAC Members in the EPO

GWAC members will also play a central role in education and outreach efforts. Members are expected to provide regular GWAC updates to their constituencies, identify and help coordinate outreach opportunities within their own organizations, and convey feedback to the EPO. They will also be invited to participate in, and to help solicit volunteers for, outreach efforts.

As the oversight body of the EPO, the GWAC will also provide ongoing guidance to the EPO through recommendations, feedback and course corrections during the development of the GWMA program.

Outreach Tools

The following is a highlight of recommended outreach tools; a comprehensive list is included as Appendix (B).

GWMA Website

The GWMA website will serve as the central clearinghouse for the GWAC and the GWMA development. It will invite audience participation in the process, offer access to educational and self-help materials, provide information exchange between the GWAC and the public, and solicit feedback on the outreach strategy and the GWMA development.

Outreach materials (correspondence, fact sheets, flyers) will direct audiences to the website, and provide an additional means for audiences to access resources and to receive updates. The website may be viewed at www.yakimacounty.us/gwma.

Bilingual educational and outreach materials

Outreach materials (flyers, posters, mailings, survey instruments) will be made available in both English and Spanish. Based on feedback from previous outreach efforts, materials will convey the plan's key messages in a simple, easy to read format.

Evaluation Measures

A consistent survey instrument will be developed and used with each audience contact (through the website, at events, etc.). The purpose will be to solicit feedback on outreach efforts and their effectiveness, and to evaluate participants' current understanding of the issues, their awareness of the GWAC and their degree of involvement with the GWMA development.

A detailed list of evaluation measures is included as Appendix (B).

Key Milestones: 2013-2014

The key milestones for the outreach plan reflect an ongoing cycle of preparation and outreach, followed by review and evaluation and a subsequent report back to the GWAC. This dynamic approach allows the strategy to remain relevant over time and under changing conditions. It also ensures that the GWAC has sufficient information to provide meaningful input, or to make course corrections or suggestions as it develops the GWMA program.

The EPO Milestones are included as Appendix (C).

Appendix A

Appendix A

GWAC **Public Involvement & Outreach Plan Contributors**

Andres Cervantes, GWAC Member

Tom Tebb, GWAC Member

Jean Mendoza, GWAC Member

Wendell Hannigan, GWAC alternate

Rachel Little, Benton Conservation District

Gretchen Stewart, U.S. Environmental Protection Agency

Nieves Negrete, Citizen Volunteer

Patricia Newhouse, Citizen Volunteer

Elizabeth Torres, Radio KDNA

Appendix B

(B1) Internal Audiences-	Agency Leadership	OBJECTIVES	OUTREACH TOOLS	EVALUATION MEASURES
<p>Yakima County & Benton County Health Districts</p> <p>Benton County Planning, Permitting, Surface Water Conservation Districts</p> <p>Department of Agriculture</p> <p>Department of Health</p> <p>Department of Ecology</p> <p>EPA</p> <p>Public Water Systems</p> <p>Cities & Towns</p> <p>Yakima Valley Conference of Governments</p>	<p>Communicate with agencies about the GWAC planning process; inform and educate stakeholders regarding nitrate contamination and its effects.</p> <p>Coordinate outreach efforts with other agencies to maximize effectiveness and distribution.</p> <p>Frequency: semi-annually or as dictated by agency opportunities.</p> <p>Use agencies' existing outreach (newsletters, website, Facebook, tweets, etc.) to announce GWAC's work and to provide updates.</p> <p>Use e-mail distribution list for general updates.</p> <p>Offer presentations and/or displays at professional conferences, annual meetings, etc.</p>	<p>GWAC Agency representatives are expected to report regularly back to their respective leadership, using face-to-face meetings, fact sheets, talking points, or informal presentations on a "need to know" basis.</p> <p>Use internal agency venues (brown bag lunches, Ed meetings, etc.) to announce program and provide periodic updates.</p> <p>Frequency: semi-annually or as dictated by agency opportunities.</p> <p>Use agencies' existing outreach (newsletters, website, Facebook, tweets, etc.) to announce GWAC's work and to provide updates.</p> <p>Use e-mail distribution list for general updates.</p> <p>Offer presentations and/or displays at professional conferences, annual meetings, etc.</p>	<p>Number of new participating agencies</p> <p>Number of face-to-face meetings</p> <p>Number of fact sheets developed</p> <p>Number of talking points/presentations developed</p> <p>Number of outreach recommendations received & implemented</p> <p>Amount/character of audience feedback</p>	<p>Number of e-mail contacts received</p> <p>Number of updates sent via e-mail list</p> <p>Number and character of comments, questions, suggestions and praise.</p> <p>Number of agency/organization requests to be involved in GWMA</p> <p>Structured interviews with key stakeholders to measure understanding of issues, degree of involvement with GWMA</p>

(B2) Internal Audiences- Policymakers & Legislative Staff		OBJECTIVES	OUTREACH TOOLS	EVALUATION MEASURES
County Commissions (Benton & Yakima) Governor's Office 13, 14, 15 & 16 Legislative District Leadership State Agency Heads (AG, Ecology, Health) Fourth Congressional District (Doc Hastings)	<p>Keep policymakers apprised of GWAC efforts and its relevance to public health</p> <p>Obtain political support for GWMA at multiple leadership levels and across affiliations</p> <p>Cultivate policymaker support as a vehicle to obtain additional funding</p> <p>Develop and maintain a reputation as an effective, science-based collaborative effort to protect human health</p>			
<p>Send introduction letters to policymakers announcing the GWAC, the GWMA program and to invite participation in the effort.</p> <p>Frequency: once; followed by periodic "red letter" updates, e-mails, etc.</p> <p>Brief leadership and/or legislative staff using face-to-face meetings supplemented with support materials (fact sheets, links to website, etc.)</p> <p>Frequency: once; followed by periodic updates</p>				<p>Number of mailings</p> <p>Number of e-mails</p> <p>Number of inquiries, or follow-up contacts initiated by policymaker or legislative staff</p> <p>Structured interviews with key stakeholders to measure understanding of issues, degree of involvement with GWMA</p> <p>Amount/quality of direct support (funding, legislative action) received</p>
(B3) Internal Audiences- Tribal Leadership		OBJECTIVES	OUTREACH TOOLS	EVALUATION MEASURES
Yakama Nation General Council Yakima Nation Tribal Council	<p>Keep tribal leadership apprised of the GWAC's efforts</p> <p>Seek to develop a collaborative outreach program between the Lower Valley GWMA and the Yakama Nation's efforts.</p>			
<p>Provide similar policymaker outreach tools (introduction letter/fact sheet, offer to make presentations to leaderships, etc.) to Nation's GWAC representative.</p> <p>Frequency: as guided by Nation's GWAC representative.</p> <p>Provide materials and presence of the Tribal Housing Summit, Treaties, and other community events.</p> <p>Frequency: semiannually, or as invited to participate.</p> <p>Offer to provide presentations and/or materials to schools. Frequency: as invited to participate.</p>				<p>Similar to policymaker outreach - focus on counting and documenting outreach efforts.</p> <p>Number/type of invitations from tribal leadership to engage in collaborative outreach.</p>

(B4) Target Audience	OBJECTIVES	OUTREACH TOOLS	EVALUATION MEASURES
<p>Residents served by private wells in the GWMA.</p> <p>Benton and Yakima County Residents (general public)</p> <p>Media</p> <p>Healthcare Providers</p> <p>School Districts</p> <p>Higher Education</p>	<p>Provide information to private well users on nitrate self-help and groundwater quality protection measures.</p> <p>Educate public audiences about groundwater, risks of elevated nitrate to human health and the GWAC and GWMA program.</p> <p>Invite participation in the development of the GWMA program.</p> <p>Develop and maintain a reputation as an effective, science-based, non-regulatory effort to protect human health</p>	<p>Involvement area media in events and GWAC updates using news releases, fact sheets and invitations to events.</p> <p>Host community water testing and education events in various target neighborhoods most likely to have high nitrate in drinking water.</p> <p>Frequency: 2-4 times annually.</p> <p>Direct mailings.</p> <p>Bilingual door-to-door campaign in the GWMA.</p> <p>Create and maintain a "groundwater message hotline" for resource and referral purposes.</p> <p>Create posters, fliers and table tents for distribution throughout the community and at key community events.</p>	<p>Amount and character of media coverage</p> <p>Number of community events</p> <p>Number of participants at events</p> <p>Number of drinking water samples processed</p> <p>Number of resident requests for assistance or follow-up</p> <p>Number of households contacted</p> <p>Number of residents requesting additional information</p> <p>Structured interviews with key stakeholders to measure understanding of issues, protection measures taken, degree of awareness of GWAC and/or GWMA.</p>

(B5) Target Audience- Underserved/English As Second Language	OBJECTIVES	OUTREACH TOOLS	EVALUATION MEASURES
<p>Residents served by private wells in the GWMA.</p> <p>Benton and Yakima County Residents (general public)</p> <p>Spanish-language Media</p> <p>Healthcare & Social Service Providers</p> <p>School Districts</p> <p>Higher Education</p>	<p>Reach out to non-English speakers to educate and involve them in the GWAC planning efforts.</p> <p>Provide education on the health risks of nitrates and self-help measure's to non-English speakers through targeted media, large employers and healthcare and social service providers.</p> <p>Invite participation in the development of the GWMA program.</p> <p>Develop and maintain a reputation as an effective, science-based, non-regulatory effort to protect human health</p>	<p>Involve Spanish-area media in events and outreach using paid ads, PSAs, and radio talk shows.</p> <p>Coordinate with healthcare and social service providers, churches, U of W and Projeto Bienestar to provide education and to evaluate communication measures.</p> <p>Offer targeted educational outreach and community water testing at Cinco de Mayo, Hispanic awareness month festivals etc. in neighborhoods most likely to have high nitrate in drinking water. Frequency: 2-4 times annually.</p> <p>Direct mailings.</p> <p>Bilingual door-to-door campaign in the GWMA.</p> <p>Create and maintain a "groundwater message hotline" for resource and referral purposes.</p> <p>Create posters, fliers and table tents for distribution at large employers in the GWMA and throughout the community.</p>	<p>Amount and character of media coverage</p> <p>Number of community events</p> <p>Number of participants at events</p> <p>Number of drinking water samples processed</p> <p>Number of resident requests for assistance or follow-up</p> <p>Number of households contacted</p> <p>Number of residents requesting additional information</p> <p>Structured interviews with key stakeholders to measure understanding of issues, protection measures taken, degree of awareness of GWAC and/or GWMA.</p>

(B6) Target Audience-Special Interests	OBJECTIVES	OUTREACH TOOLS	EVALUATION MEASURES
Agricultural Groups (Dairy Federation, Farm Bureau, Fertilizer Groups, Hop Growers, Mint Growers, Irrigated Ag Producers)	Inform targeted special interest groups of the GWAC planning process and programs.	Distribute outreach materials (posters, fliers) to special interest groups.	Number of materials requested and/or distributed
Centers for Disease Control (CDC)	Offer speaker presentations at regularly scheduled meetings.	Offer speaker presentations at regularly scheduled meetings.	Number of presentations requested
Center for Environmental Law & Policy	Educate targeted special interest groups about relevant measures to protect groundwater from nitrate levels that exceed drinking water standards.	Develop and maintain social media sites, e- newsletters etc. targeting special interest audiences.	Number of participants at events
Faith-based Groups	Network with regional dairy women and other industry representatives.		Amount/character of audience feedback
Farm Workers Clinic	Provide education to targeted special interest groups on the health risks of nitrates and self-help measures.		Number of e- social media contacts received
Large Employers			Number of updates sent via e-mail list
Environmental & Social Justice Organizations			Number and character of comments, questions, and praise.
Women's Groups			Structured interviews with key stakeholders to measure
Yakama Nation			understanding of issues, degree of awareness of the GWMA and its purpose

Appendix C

