Johnson Creek Watershed Bacteria Total Maximum Daily Load

Detailed Implementation Plan

October 2003
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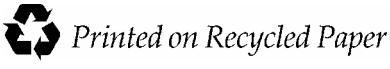

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Detailed Implementation Plan

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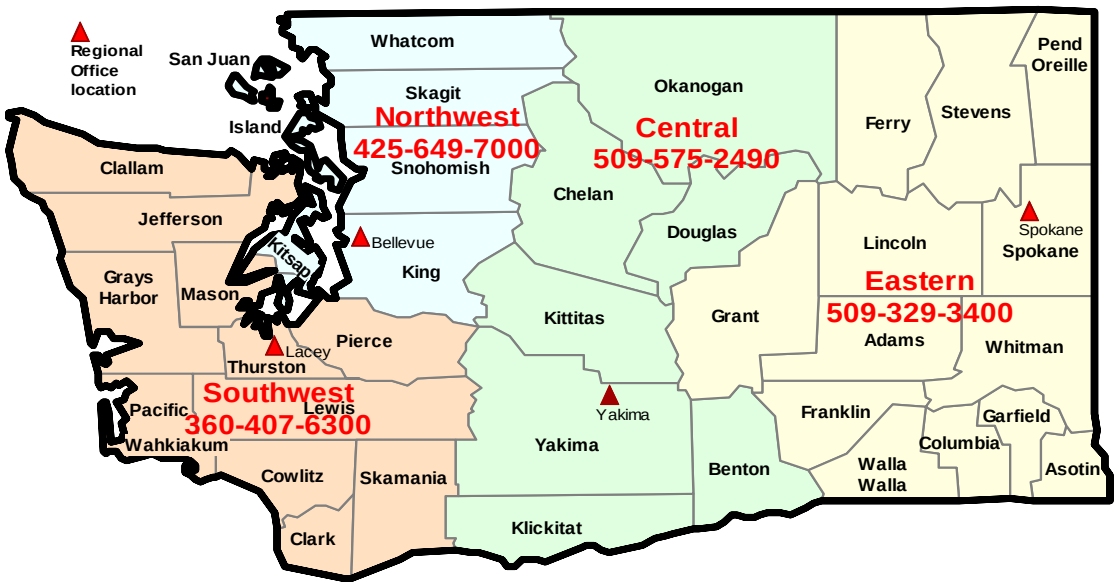

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Executive Summary

The following plan details how and when pollution reductions will be achieved to meet water quality standards in the Johnson Creek watershed.

Violations of standards for fecal coliform and dissolved oxygen were documented in 1998 through extensive sampling of Johnson Creek and key tributaries. In June 2000, the Washington Department of Ecology (Ecology) established fecal coliform pollution limits for the Johnson Creek watershed through adoption of its "total maximum daily load" (TMDL) analysis.

As required under an agreement between Ecology and the U.S. Environmental Protection Agency, the following plan details how implementation will occur to achieve pollution reductions specified in the Johnson Creek TMDL.1

This document provides a framework for implementing wasteload allocations and load allocations established in the Johnson Creek TMDL. The responsibilities of each of the parties, and the means of tracking results, are also established.

The pollution reduction targets of the Johnson Creek TMDL are based on bacterial criteria of the Washington State Water Quality Standards. There are two criteria for bacteria. The first criterion sets a maximum for the geometric mean criteria. The second criterion sets a maximum density of bacteria for the 90th percentile. Experience has shown that when correcting nonpoint pollution sources, both the geometric mean and the 90th percentile will drop at similar rates. For this study, the 90th percentile criterion was the most stringent criterion. As a result, geometric means targets are below the criterion of 100 cfu/100 ml established in the Water Quality Standards. It is against the target geometric mean that tracking will primarily take place.

The implementation of the load allocation is based on the assumption that existing rules, regulations, and programs, if fully implemented, will achieve our goals for the Johnson Creek watershed. Adaptive management methods will be used to quickly identify whether additional effort or focus from existing programs is needed. If adaptive management demonstrates that existing programs are not adequate, new programs will be developed.

The primary means of ensuring compliance is a quarterly comparison of water quality monitoring data with established targets. Also tracked will be implementation milestones to be achieved by a variety of organizations. Several agencies have begun working to meet the objectives of the Johnson Creek TMDL. Already water quality criteria are being met in Johnson Creek and its tributaries.

1 The "detailed implementation plan" as required and described in the Memorandum of Agreement Between The United States Environmental Protection Agency and Washington Department of Ecology Regarding the Implementation of Section 303(d) of the Federal Clean Water Act

Introduction

Section 303(d) of the federal Clean Water Act requires states to develop water cleanup plans for water bodies that fail to meet water quality standards. A plan to reduce fecal coliform bacteria and biological oxygen demand in the Johnson Creek watershed was submitted by Ecology to EPA and approved in 2000. This plan to clean up those waters within the Johnson Creek watershed is called a "total maximum daily load" (TMDL) and lays down goals and objectives for achieving clean water in this area.

As part of an agreement on the implementation of section 303 (d) of the federal Clean Water Act, Ecology must prepare a "detailed implementation plan (DIP)" which includes a monitoring plan and measures of success.

This document is the detailed implementation plan for the Johnson Creek watershed.
Other documents related to the Johnson Creek TMDL are available through the Ecology web site at http://www.ecy.wa.gov/programs/wq/tmdl/index.html or by request at Ecology's Bellingham Field Office. This plan is based on the technical assessment, and decisions contained in those documents.

The idea behind implementation for achieving reductions in pollution in the Johnson Creek watershed is that existing programs and requirements, if fully enforced, should result in meeting the Johnson Creek TMDL targets. This document provides the detail of how monitoring of water quality and implementation activities will be used to track progress as well as indicate when adaptive management procedures need to be employed.

The available loading capacity has been assigned to nonpoint sources and one point source. Point sources must meet Johnson Creek TMDL targets at the point of discharge. The only point source at this time is a dairy that is receiving coverage under the National Pollution Discharge Elimination System (NPDES) Dairy General Permit. Additional dairies may be required to be permitted in the future.

The nonpoint sources (i.e. Non-point dairy farms, beef cattle, and heifer operations) are assigned a load allocation which is assumed to be uniformly distributed over the land within the water shed. When a NPDES Dairy General permit is issued, the dairy itself is not given an allocation. Instead of reducing the non-point load allocation based on the acres subject to non point loading in the catchment area and then making a waste load allocation (WLA) to the dairy, the dairy itself is not given an allocation. The catchment area is that area being farmed. The dairy is allowed to continue to use the load allocation based on the acreage under control of the dairy and a WLA of zero is assigned. The interpretation is that there is a zero increase from the load allocation. This is done because the acreage of dairies changes frequently, since farmers either lease or rent more or less land due to changing herd size, so a WLA made at the time of coverage under the permit would not necessarily be appropriate later in the permit cycle. Point sources are dairies permitted by the Dept. of Ecology under the Dairy General Permit, and approved dairy management plan. Point sources must meet Johnson Creek TMDL targets at the point of discharge.

This document is organized as follows:

- Section I is this introduction.
- Section II outlines the general approach to implementing the Johnson Creek TMDL.
- Section III identifies and describes pollution sources and organizations responsible for implementing source control measures.
- Section IV describes organizations responsible for achieving pollution reductions, and performance measures.

The Approach

Evaluation of water quality monitoring data and status reports from each organization responsible for achieving reductions in fecal coliform will be required quarterly, to meet the goal of meeting water quality standards within five years. The evaluation criteria and possible outcomes are summarized below in Table 1.

Table 1 - Water Quality Conditions and TMDL Implementation

	Water Quality Targets Met	**Water Quality Targets Not Met**
Implementation Schedule Met	State I – No change needed	State II – Accelerate implementation schedule and/or add additional control measures
Implementation Schedule Not Met	State III – Meet implementation schedule	State IV – Meet implementation schedule and/or add additional control measures

- State I: Both water quality and implementation goals are met, no change in scheduled activities is needed.
- State II: Ambient water quality goals are not being met, but implementation goals are being met: the immediate response will be to accelerate implementation activities. If after three subsequent quarters, accelerated implementation proves insufficient to meet water quality goals, additional control measures will be developed and implemented.
- State III: Ambient water quality goals are being met, but implementation goals are not being met; implementation will be accelerated to meet implementation goals by the next quarter. This is consistent with the goal of meeting water quality standards as soon as possible.
- State IV: Neither ambient waster quality nor implementation goals are being met; an accelerated implementation schedule or additional control measures will be required. Decisions will be made based on results of source identification monitoring as outlined in Section.

The quarterly water quality goals are based on a decrease in the geometric mean of fecal coliform density over the maximum five-year timeline. We have assumed that BOD and bacteria have similar sources. Compliance with bacteria provides an adequate and understandable measure of improvements in water quality, and effectiveness of implementation in controlling pollutant sources. Therefore BOD will not be monitored. Instead when bacteria targets are met, dissolved oxygen (DO) will be evaluated for compliance with the TMDL targets.

There are significant variations in fecal coliform densities due to the diurnal cycle of dissolved oxygen, and environmental conditions at a given point in time. Since variations exist we believe implementation activities should continue even when quarterly targets are met. For instance, streams in the Johnson Creek watershed may currently be meeting the water quality targets, but they may be experiencing unusually dry conditions. A reduction in rain may account for reduced bacteria in areas that drain agricultural lands.

By continuing full implementation, a level "playing field" is assured for the regulated community.

Pollution Sources and Corresponding Organizations

Pollution Sources

Table 2 summarizes potential sources of bacteria pollution.

Table 2 – Potential Bacteria Sources

Source	**Explanation**
Agriculture Permitted and Non-permitted	Animal waste pollution from improper grazing, manure application, or storage practices
On-Site Septic Systems (OSS)	Sewage treated by separation of solids and liquids in a septic tank and further filtration of liquids in a drain field and underlying soils
Sediment	Bacteria my be "stored" in sediments and re-suspended under certain conditions
Stormwater	Hobby farm and residential pet waste, illegal connections of sewage systems to storm drainage systems
Wildlife	Considered as part of the "background" bacteria level, but has not been quantified

Any non-agricultural activity that is not required to operate under an NPDES permit is considered "non-permitted" as described below. In Whatcom County, the most common are dairy farms.

Dairy farms typically include the home site, cattle housing and confinement areas, milking facilities, fee storage areas, equipment sheds, and waste handling collections and storage facilities**.** There are 13 active dairies in the Johnson Creek watershed. The average number of total herd size in the Johnson Creek watershed is 430 animals. This number includes milking cows, heifers, non-producing dairy cows, and calves. Many dairy farms in the county are located in flood plains or are adjacent to rivers, lakes, or streams (surface waters). From November through March, soils are saturated with rain resulting in high water tables. Feed waste, silage leachate, milk-house drainage and manure from animal confinement areas or manure storage areas are common sources of polluted runoff from these dairy operations. Major concerns include nutrient and bacterial pollution of surface and ground water.

Farm management systems will be designed and constructed to collect, handle, transfer, and store manure, feed waste, silage leachate, and milking center wastewater. Runoff from animal confinement areas, including outside lots and slabs, will be collected and diverted from waste storage facilities. Livestock will be excluded from direct access to surface water. Vegetated buffers will provide habitat and help reduce nutrient, bacteria, and organic matter inputs to watercourses. These controls will apply to all livestock operations.

Class A dairies are regulated by Washington's Dairy Nutrient Management Act, RCW 90.64, and must have and implement a dairy nutrient management plan. A nutrient management plan describes how to manage nutrient-rich by-products of dairy operations. In most cases, these by-products will be applied to pasture and hay lands. When manure is applied to land, the nutrient management plan must identify when growing plants are able to capture and use nutrients for plant growth. The plan must also identify times of the year and weather conditions when land application of these by-products could pollute surface of groundwater. Plans are approved by the Whatcom Conservation District and all plans have been approved.

The final step is to certify the dairy nutrient management plan (DNMP). The two-part process is described below.

1. The Whatcom Conservation District certifies that the practices necessary to manage the by-product nutrients from the dairy operation have been properly installed; and

2. The dairy producer certifies that he or she is managing the nutrients as described in the plan.

All plans are to be implemented by December 31, 2003.

Non-Dairy Commercial Livestock

Commercial livestock operations are similar to dairies except that they don't include milking facilities. Also, with commercial livestock operations, the animals tend to spend more time on pasture. These farms typically include fenced livestock pastures or feedlots.

Conservation practices recommended for livestock are selected to improve forage production, nutrient utilization, and wildlife habitat. Water quality concerns will be reduced or eliminated by practices that include collection and proper storage of manure during winter, improving plant cover through pasture management or reseeding, diverting clean water, and "armoring" heavy-use areas with wood chips or similar mulching materials. Livestock management is crucial. Animals will be excluded from watercourses. They will be managed to improve forage production and water quality.

Agriculture – Permitted

A farm or ranch that confines animals for 45 days or more in a 12 month period, and does not include forage or crops in the containment area (other than incidental vegetation) is defined as an animal feeding operation (AFO). Any dairy that meets the definition of a combined animal feeding operation (CAFO) in the federal Clean Water Act is required to operate under the NPDES General Permit for Dairies. In general, any farm with over 700 animals confined will be a CAFO. In addition, any dairy, which is a documented source of pollution, though doesn't meet the definition of a CAFO, may still be required to apply for an NPDES permit. The statutory timeline provided for in RCW 90.64 applies to permitted dairies unless an administrative order specifies an earlier date. The Whatcom Conservation District elected to operate at compliance Level IV under the Compliance Memorandum of Agreement between the Department of Ecology, the Conservation Commission, and the Whatcom Conservation District. This is the most stringent level of compliance.

On-site Septic Systems

Residential septic systems are designed to use unsaturated soil beneath the drain field to remove bacteria from sewage and household wastewater. Soil compaction, clogging with solids and system overload from too much water can cause failures of a septic system. The Whatcom County Health and Human Services (health department) provides information on operation and maintenances to one fifth of the residents of Whatcom County each year. Working on referrals from Department of Ecology, the health department will also follow up with residential septic inspections when agricultural operations are ruled out as bacteria sources in specific areas. The health department sends a reminder every five years to homeowners in Whatcom County to pump their septic system.

Sediment

Bacteria and other organic matter can collect in sediments until they are released and re-suspended in water. It is unknown to what degree contamination measured in water may be attributed to bacteria present in the substrate (e.g. sediments). Sediment has been isolated as a source of bacteria in at least one case locally where a specific and documented discharge of manure into a waterway resulted in high bacteria levels well after the time at which the direct

input of manure had ceased. This phenomenon has been documented elsewhere in Puget Sound and is often referred to as “sediment archiving”.

Stormwater

Stormwater can carry bacteria from pet wastes or overflows of manure containment ponds. The area is largely agricultural and so stormwater sources are predominantly addressed under agricultural sources.

Wildlife

Similar to other nonpoint sources, wildlife waste contributions are part of the load allocation. It may be necessary in some locations to adjust load allocations if it is evident that the wildlife contribution is significant or causing load allocations to be exceeded. Where the wildlife component and the human component can be separated, the wildlife component will be subtracted from the load allocation and the remainder will become the new allocation. If the wildlife component exceeds the load allocation, no human caused increase will be allowed and other load allocations may need to be revised to ensure that downstream water bodies can meet water quality standards.

Pollution Sources and Organizational Responsibilities

The following agencies are cooperating on the on the implementation of the Johnson Creek TMDL;

Washington Department of Ecology

Washington State Department of Ecology (Ecology) has been delegated authority by the EPA for implementing many aspects of the federal Clean Water Act. This includes the NPDES permitting and the TMDL program. Ecology also helps local governments meet water quality goals through technical assistance and grants or loans, providing millions of dollars for area projects in the past decade.

Washington Department of Agriculture

On July 1, 2003, Washington Department of Agriculture will assume responsibility for regulating RCW 90.64, the Dairy Nutrient Management Act.

U.S. Environmental Protection Agency

The Environmental Protection Agency (EPA) is responsible for validating the Department of Ecology’s implementation of the Johnson Creek TMDL and enforcement of the Clean Water Act. EPA provides funding to states and tribes to implement the Clean Water Act.

U.S. Natural Resource Conservation Service

The Natural Resource Conservation Service (NRCS) provides technical guidance in developing farm plans; these plans are critical components of good environmental practices by agricultural

operations. The NRCS also administers financial assistance programs, in partnership with the Whatcom Conservation Service.

Whatcom County Health and Human Services

Whatcom County Health and Human Services (WCHHS) administers a residential septic system program that includes regulatory oversight of all septic systems in Whatcom County. This oversight includes:

- Site application review for new, repaired, or expanded septic systems.
- Permit issuance.
- Survey, construction, and operational inspections.
- Subdivision, boundary-line adjustment and conditional use review.
- Complaint investigations.
- Enforcement of OSS ordinances WCC 24.05 implementing state regulation WAC 246-272.
- Homeowner education.
- Certification of septic system pumpers, installers, and operation specialists .

Whatcom County Planning and Development Services

Whatcom County Planning and Development Services (WCPDS) enforce ordinances related to environmentally critical or sensitive areas under the state's growth management requirements. One element of the critical areas ordinance (CAO) mandates buffers with native vegetation on all streams unless land is managed under an approved and implemented farm plan. Another element is a locally initiated ordinance limiting times of the year in which manure can be spread or applied on fields. The manure management ordinance prohibits the application of manure on bare ground or corn stubble in the winter. Both have proved to be valuable tools in eliminating contaminated run-off.

Whatcom County Public Works

Whatcom County Public Works (WCPW) acts as the agent for special drainage and diking districts of Whatcom County. Public Works has secured funding from Ecology's competitive grant program to fund the establishment of riparian vegetation buffers. They have written a drainage plan for Johnson Creek that may help address DO. The plan has been taken to the public, in part through public meetings and stakeholder groups. The plan has been finalized and will begin implementation during the summer of 2003. Elements of the drainage plan have been added to this plan.

Whatcom Conservation District

Whatcom Conservation District (WCD) provides substantial technical and financial assistance to dairy operators throughout the county. However, there are scant resources available to all other livestock operations at this time.

Management Roles, Activities, and Schedules

Appendix A contains detailed implementation schedules for organizations responsible for pollution reductions, as well as a description of performance measures for each agency. Table 3

shows the management responsibilities of each of the organizations above. The source or sources for which the organization is most directly associated is also provided; the final column on performance measures summarizes much of the information included in Appendix A. There is not a one-to-one correspondence between the items in the columns headed Authority/Responsibility, Sources, and Performance Measures. Some areas of responsibility apply to more than one source and some areas of responsibility or sources are not amenable to setting performance measures.

Each implementing agency has established the appropriate performance measures and quarterly goals for its respective implementation activities and responsibilities. Schedules were developed based on historic capacity and the projected needs of respective agencies or organizations. At this time there are no additional resources identified. Over time, additional funding needs may develop and will be reported.

Water Quality

Studies in 1990 and 1992 demonstrated low dissolved oxygen in Johnson Creek, Squaw Creek, Pangborn Creek, and Clearbrook Creek. Over the years, the riparian vegetation has been removed from most of the streams to increase the area actively farmed, either for pasture or for forage crops. The result has been a significant amount of runoff from field application of dairy nutrients into the streams. Dairy nutrients have been a major contributor to higher biological oxygen demands (BOD) which lower oxygen levels in the effected surface waters. Elevated levels of fecal coliform bacteria are also present, in part due to land applied dairy nutrients.

Implementation

Ecology has been delegated authority by EPA to establish water quality standards, administer the NPDES program, and enforce water quality regulations. Water quality standards for fecal coliform bacteria and water temperature have historically been violated in the water bodies within the Johnson Creek watershed. One of the ways in which the Johnson Creek TMDL for fecal coliform bacteria will be put into practice is through the implementation of farm plans and farm inspections. The Washington State Dairy Nutrient Management Act was passed in 1998, and requires all Class A dairies to have a farm plan by July 1, 2002. After receiving a farm plan, dairies must implement the plan by December 31, 2003. The Act was originally delegated to Ecology to regulate those farms affected by the regulations, though presently the Dept. of Agriculture has been given charge to regulate and inspect under the Act. All of the dairies in the Johnson Creek watershed have been inspected at least twice in the past four years by Ecology. This has proved very successful in the Lower Nooksack TMDL. An example of mitigating water temperature in the watershed will be Whatcom County Public Works riparian plantings after removing in-stream canary reed grass. Riparian plantings will grow providing shade to the stream thereby lowering water temperature and shading out canary reed grass. Lower temperature water is able to carry higher oxygen content.

Effectiveness Monitoring

The purpose of effectiveness monitoring is to provide assurance that control measures put in place during TMDL implementation achieve the expected load reductions. Ecology is responsible for determining, through effectiveness monitoring, the status of water bodies

subsequent to the development and implementation of each TMDL. The timing of this monitoring will be dependent upon the pollution parameters addressed in the TMDL, the period after which positive results should be identifiable, and the availability of resources. Effectiveness monitoring priorities will be selected by each regional office and verified through the annual scoping process.

In order to be thorough in accomplishing this task, monitoring personnel will follow a review sequence. The sequence will include consultations with the original TMDL modeler to determine critical parts of the implementation plan and to verify critical locations. They will also contact the regional office TMDL coordinator to learn the results of implementation monitoring and the status of the TMDL implementation plan. Both monitoring and regional staff will make an effort to identify a local partnership to assist with the actual data collection. On completion of these steps, an examination of the resulting data will be made and a water quality status determination will be announced for the water body in an advisory memorandum followed by a technical report.

Adaptive Management Review

Ambient water quality monitoring, along with implementation tracking, are expected to yield one of four possible outcomes as outlined in Table 1. It is when ambient water quality targets are not being met and implementation targets are being met (State IV) that adaptive management is required.

The first response will be source identification monitoring. If tracking the source and applying existing implementation activities does not or is not expected to result in achieving targets, then further source identification will be conducted and appropriate control measures developed and implemented.

Ecology, through delegation from EPA, ultimately has enforcement responsibility for elements for this plan. Education, outreach, technical and financial assistance, and enforcement will be used to ensure compliance with the Johnson Creek TMDL. Generally, the first step in implementing control actions will be a referral to agencies with technical and/or financial assistance missions. When those tools are not effective in achieving implementation of control measures enforcement will be used.

Funding

CREP and EQUIP – Federal funding for these programs has been increasingly short of demands. The qualifications to receive funding have also been changing and have been part of the reason why fewer applicants will be receiving funding. Whatcom County was provided with $600,000.00 for EQUIP funding for FY 2003. Ecology is able to offer funding in the form of grants and loans through two programs. The Centennial Clean Water Fund (Centennial), which provides low-interest loans and grants for wastewater treatment facilities and fund-related activities to reduce nonpoint sources of water pollution. The Section 319 Nonpoint Source Grants Program (Section 319), which provides grants to reduce nonpoint sources of water pollution. These funding mechanisms are available to local governments, Indian tribes, non-profit organizations, and special purpose districts (e.g. Health and water districts).

Synthesis

The value of the monitoring data in guiding implementation activities has been well demonstrated by the Lower Nooksack TMDL. The results since the summer of 2000 make it clear that focusing efforts on areas that are not responding has proven very effective. The credit must go to having reliable data and cooperative partners willing to focus their efforts to solve particular problems. Those partners working towards full implementation of the Johnson Creek TMDL may achieve the goal of meeting the ultimate targets in less than the projected five years if the example set by the Lower Nooksack TMDL can be followed.

Enforcement

The Water Pollution Control Act (chapter 90.48 RCW) provides broad authority to issue permits and regulations, and prohibits all discharges to water. The act openly declares that it is the policy of the state to maintain the highest possible standards to ensure the purity of all waters of the state and to require the use of all known, available, and reasonable means to prevent and control water pollution. The act defines waters of the state and pollution, and authorizes the Department of Ecology to control and prevent pollution, to make and enforce rules including water quality standards. The act also designates Ecology as the state water pollution control agency for all the purposes of the federal Clean Water Act. Under this statute, Ecology is authorized to administer wastewater disposal permits and to require prior approval of plans and methods of operation of sewage or other disposal systems. Ecology, through delegation from EPA, ultimately has enforcement responsibility for elements of this plan. Education, outreach, technical and financial assistance, and enforcement will used to ensure compliance with the Johnson Creek TMDL. Generally, the first step in implementing control actions will be a referral to agencies with technical and/or financial assistance missions. When those tools are not effective in achieving implementation of control measures, enforcement will be used.

Table 3 - Implementing Agencies, Organizations

Agency	Abbreviation	Authority/Responsibility	Sources	Performance Measures
Department of Ecology	**Ecology**	**Education** Provide technical assistance to Livestock farmers. Report on Johnson Creek TMDL implementation **Financial Assistance** Provide funding through Centennial Grants, 319 Funds, and State Revolving Loan Funds. **Enforcement** Delegated authority by the EPA to issue NPDES permits under the Clean Water Act, establish water quality standards, establish TMDLs, and enforce state Water Pollution Control Act (90.48) **Effectiveness Monitoring** Quarterly review data and status reports from organizations responsible for achieving fecal bacteria reductions and riparian work.	**Agriculture –** non-permitted **Agriculture –** permitted **Stormwater**	Quarterly reports on Johnson Creek TMDL implementation**.**
U.S. Environmental Protection Agency	**EPA**	**Financial Assistance** Grants to states and tribes to fund water quality facilities and activities **Enforcement** Enforce the Clean Water Act including oversight of state responsibility to implement NPDES and TMDL program.	**N/A**	Review annual reports from Ecology on Johnson Creek TMDL implementation.
Washington State Department of Agriculture	**DOA**	**Educate** Provide technical assistance relating to Dairy Nutrient Management Plans	**Agriculture -** permitted	Dairy inspections (see appendix A)
U.S. Natural Resource Conservation Service	**NRCS**	**Educate** Provide technical assistance and guidance for WCD. Provide technical and financial assistance to farmers. Formerly known as the Soil Conservation Service (SCS). **Financial Assistance** Provide funding through Environmental Quality Incentive Program (EQIP)	**Agriculture –** non-permitted **Agriculture –** permitted	Provide $600,000.00 in funding to dairies via cost share funds. Funding may vary per year.

Agency	Abbreviation	Authority/Responsibility	Sources	Performance Measures
Whatcom County Public Works, Consolidate Drainage Improvement District #31, Sumas/Nooksack/Everson subzone	**WCPW, CDID #31, S/N/E**	Reduce flooding of farmland by improving stream conveyance capacity. Maintain capacity by planting riparian buffers.	**Agriculture –** non-permitted **Agriculture –** permitted	Remove reed canarygrass and plant riparian buffers.
Whatcom County Health Services	**WCHS**	**Education and Enforcement** Manage OSS program. Inspect OSS in areas with suspected failing systems	**OSS**	Inspect 1 residential on-site septic system per quarter
Whatcom County Planning and Developmental Services	**WCPDS**	**Enforcement** Enforce the Critical Areas ordinance. Enforce the Manure Management ordinance.	**Agriculture -** Non - permitted	Respond to 1 referral per quarter.
Whatcom Conservation District	**WCD**	**Education** Provide technical assistance to farmers in the form of farm plans. **Financial Assistance** Allocates financial assistance to farmers. Manages funds for OSS loan program.	**Agriculture –** Permitted **Agriculture –** Non - permitted	1 small farm plan per quarter.

Performance Measures and Targets

Table 4 below summarizes the target geometric means and the load allocations expressed as the percent reduction needed to be made in the Johnson Creek TMDL. The target geometric means should be met as soon as possible, but no later than June, 2008.

It is assumed that if an identified tributary is meeting its targets, it is not necessary to track that specific sub-area. If targets are not being met, it may be necessary to begin tracking a sub-area to help focus efforts. If tracking becomes necessary, sub-areas will comply with the same target geometric means as the overall area.

The quarterly targets are based upon a decrease in the geometric mean over five years, with each quarter's target being a percentage of the previous quarter's target. This rate of decline was selected as it was expected that the most rapid gains would be available early in the process.

Table 4 - Water Quality Targets – Fecal Coliform

Stream Name	Flow (cfs)	Target Geometric Mean	Percent Reduction Needed
Johnson Creek River Mile 8.2	0.2	100	53%
	10.5		0%
	38		0%
Johnson Creek River Mile 5.9	7	100	77%
	28		9%
	53		0%
Johnson Creek River Mile 1.0	22	100	89%
	56		72%
	115		41%
Pangborn Creek River Mile 0.1	0.8	37	95%
	5.5		63%
	9		40%
Squaw Creek River Mile 0.2	0.8	83	52%
	4		0%
	16		0%
Sumas Creek River Mile 0.1	3	42	98%
	7		94%
	10		91%

Measuring Progress Toward Goals

Ecology will collect data and progress reports from the various partners working within the Johnson Creek watershed. There will be a quarterly review by Ecology to determine success. The table entitled, "Water Quality Conditions and TMDL Implementation" will be used to determine effectiveness of the past quarters actions. If management needs to be adapted or changed, justification will be made using Table 1. For instance the implementation schedule may

be met but the targets may not be achieved. Farm plans have been implemented and inspection goals have been met but fecal coliform bacteria numbers have not decreased.

It might be that the number of inspections would need to be increased or more referrals responded to by Whatcom County Planning and Development, the local agency responsible for implementing the county's critical areas ordinance**.**

Appendix A

Quarterly Implementation Schedules

Appendix A: **Quarterly Implementation Schedules**

The inspection targets are for an annual average, some quarters may have more than the average quarterly target of inspections.

Table A.1 – Implementation Schedule for Department of Agriculture Farm Inspections as part of Dairy Nutrient Management Act

	Number of Inspections Goal	Number of Inspections Result	Referrals made
1Q03			
2Q03			
3Q03			
4Q03	1		
1Q04			
2Q04			
3Q04			
4Q04	1		
1Q05			
2Q05			
3Q05			
4Q05	1		
1Q06			
2Q06			
3Q06			
4Q06	1		
1Q07			
2Q07			
3Q07			
4Q07	1		
1Q08			
2Q08			
3Q08			
4Q08	1		

The inspections are based on the number of septic systems in the Johnson Creek watershed, anticipated referrals by Ecology, and other agencies.

Table A.2 – Implementation Schedule for Whatcom County Health and Human Services

Quarter	OSS inspections	
	Goal	**Result**
1Q03	1	
2Q03	1	
3Q03	1	
4Q03	1	
1Q04	1	
2Q04	1	
3Q04	1	
4Q04	1	
1Q05	1	
2Q05	1	
3Q05	1	
4Q05	1	
1Q06	1	
2Q06	1	
3Q06	1	
4Q06	1	
1Q07	1	
2Q07	1	
3Q07	1	
4Q07	1	
1Q08	1	
2Q08	1	
3Q08	1	
4Q08	1	

Table A.3 – Implementation Schedule for Whatcom County Planning and Development Services

Quarter	Referrals Resolved	
	Goal	**Result**
1Q03	1	
2Q03	1	
3Q03	1	
4Q03	1	
1Q04	1	
2Q04	1	
3Q04	1	
4Q04	1	
1Q05	1	
2Q05	1	
3Q05	1	
4Q05	1	
1Q06	1	
2Q06	1	
3Q06	1	
4Q06	1	
1Q07	1	
2Q07	1	
3Q07	1	
4Q07	1	
1Q08	1	
2Q08	1	
3Q08	1	
4Q08	1	

Table A.4 – Implementation Schedule for Whatcom County Public Works

	Goal – Channel Excavation	Goal – Riparian Preparation	Goal – Riparian Planting/Maintenance	Result
1Q03				
2Q03				
3Q03	In-channel excavation work = 3 miles	Reed canarygrass removal = 4 miles Erosion control mats and cover seeding = 3 miles		
4Q03				
1Q04				
2Q04				
3Q04	In-channel excavation work = 3 miles	Reed canarygrass removal = 3.5 miles Erosion control mats and cover seeding = 3 miles	2 miles	
4Q04				
1Q05				
2Q05				
3Q05	Monitor prior riparian miles – re-excavate as required	Reed canarygrass removal = 3 miles Erosion control mats and cover seeding = 3 miles	3 miles	
4Q05				
1Q06				
2Q06				
3Q06		Reed canarygrass removal = 3 miles Erosion control mats and cover seeding = 3 miles	3 miles	
4Q06				
1Q07				
2Q07				
3Q07			3 miles	
4Q07				
1Q08				
2Q08				
3Q08			3 miles	
4Q08				

The Whatcom Conservation District provides technical assistance in the form of farm plans. The district also provides funding as it is available.

Table A.5 – Whatcom Conservation District Implementation Schedule

Quarter	Farm Plans Approved	
	Goal	**Result**
1Q03	1	
2Q03	1	
3Q03	1	
4Q03	1	
1Q04	1	
2Q04	1	
3Q04	1	
4Q04	1	
1Q05	1	
2Q05	1	
3Q05	1	
4Q05	1	
1Q06	1	
2Q06	1	
3Q06	1	
4Q06	1	
1Q07	1	
2Q07	1	
3Q07	1	
4Q07	1	
1Q08	1	
2Q08	1	
3Q08	1	
4Q08	1	

Appendix B

Quarterly Water Quality Targets

Appendix B: **Quarterly Water Quality Targets**

Table B-1: Quarterly Water Quality Targets

	Johnson Creek			**Pangborn Creek**		
Quarter	**GM**	**Target**	**10%Exc**	**GM**	**Target**	**10%Exc**
TMDL Study	173	173	318	244	244	1310
4Q02	**8**	**141**	**200**	149	121	900
1Q03		136			107	
2Q03		132			95	
3Q03		127			85	
4Q03		123			75	
1Q04		119			67	
2Q04		115			60	
3Q04		111			53	
4Q04		107			47	
1Q05		103			42	
2Q05		100			37	
	GM control			10% control		

	Squaw Creek			Sumas Creek		
Quarter	GM	Target	10%Exc	GM	Target	10%Exc
TMDL Study	182	182	436	294	294	1400
4Q02	61	136	340	72	142	340
1Q03		129			125	
2Q03		123			111	
3Q03		117			98	
4Q03		112			87	
1Q04		106			77	
2Q04		101			68	
3Q04		97			60	
4Q04		92			54	
1Q05		88			47	
2Q05		83			42	
	10% Control			10% Control		

Table B-1: Quarterly Water Quality Targets (Continued)

Ratio of Current to TMDL						
	Johnson Creek			**Pangborn Creek**		
Quarter	**GM**	**Target**	**10%Exc**	**GM**	**Target**	**10%Exc**
TMDL Study	100%	100%	100%	100%	100%	100%
4Q02	5%	81%	63%	61%	49%	69%
1Q03		79%			44%	
2Q03		76%			39%	
3Q03		73%			35%	
4Q03		71%			31%	
1Q04		69%			27%	
2Q04		66%			24%	
3Q04		64%			22%	
4Q04		62%			19%	
1Q05		60%			17%	
2Q05		58%			15%	

Ratio of Current to TMDL						
	Squaw Creek			Sumas Creek		
Quarter	GM	Target	10%Exc	GM	Target	10%Exc
TMDL Study	100%	100%	100%	100%	100%	100%
4Q02	34%	75%	78%	24%	48%	24%
1Q03		71%			43%	
2Q03		68%			38%	
3Q03		65%			33%	
4Q03		61%			30%	
1Q04		59%			26%	
2Q04		56%			23%	
3Q04		53%			21%	
4Q04		51%			18%	
1Q05		48%			16%	
2Q05		46%			14%	

Appendix C

Response to Comments

Appendix C: Response to Comments

An electronic version of the plan was made available on Ecology's internet site. Notification of the availability was sent to interested parties including implementing agencies, tribes, and others with an interest in water quality in the Johnson Creek watershed. Two groups responded with comments during the comment period from October 22, 2003 to November 22, 2003.

Whatcom County Public Works

Clarification was made by Whatcom County Public Works regarding the schedule of work to be performed on Johnson Creek and it's tributaries as outlined in table A-4. The corrections were regarding the number of miles of in-channel excavation work to be performed, the number of riparian miles to be prepared for planting, and the number of miles of planting maintenance to be performed on a quarterly basis.

Response - These corrections and clarifications have been made to Table A-4.

Washington State Department of Agriculture

1. – page 6, second sentence of first full paragraph; "The average number of total herd size in the Johnson Creek watershed is 430 animals."

Response – This has been changed to, "the average herd size in the Johnson Creek watershed is 430 animals."

2. – page 7, under the title, "Agriculture – Permitted" the following italicized additions and changes were suggested: The word "concentrated" has been substituted for the word "combined" in the sentence; "Any dairy that meets the definition of a *concentrated* animal feeding operation (CAFO) in the federal Clean Water Act is required to operate under the NPDES General Permit for Dairies."

In the second sentence, "In general, any *dairy* farm with over 700 animals confined will be a CAFO."

In the third sentence, "In addition, any *small* dairy which is a documented source of pollution *may be designated* a CAFO *and* be required to apply for an NPDES permit."

A sentence was added at the end of this paragraph by request. It reads, "This Memorandum of Agreement will be updated in the near future to include the Washington Department of Agriculture."

Response – These changes and additions have been made to the document.

3. – page 8, under the title, "Washington Department of Agriculture", the following italicized additions and changes were suggested: "On July 1, 2003, Washington Department of Agriculture *assumed* responsibility for regulating RCW 90.64, the Dairy Nutrient Management Act. *This includes inspection and enforcement of RCW 90.64 for dairies and other AFOs and CAFOs."*

Response - These changes and additions have been made to the document.

4. – page 9, under the title, "Whatcom Conservation District" the following italicized changes and additions were suggested: "Whatcom Conservation District (WCD) *has* provid*ed* substantial technical and financial assistance to dairy operators throughout the county. However, there are *reduced* resources available *now for dairy or other livestock* operations at this time."

Response - These changes and additions have been made to the document.

5. – page 10, under the title, "Water Quality", in the sentence, "Over the years the riparian vegetation has been removed from most of the streams to increase the area actively farmed, either for pasture or for *forage* crops." The word *row* was suggested instead of *forage.*

Response - This change has been made to the document.

6. – page 12, under the tile, "Enforcement", the following italicized changes and additions were suggested: The Water Pollution Control Act (chapter 90.48 RCW) provides broad authority to issue permit and regulations, and prohibits all *unpermitted* discharges to water.

A sentence was added after the third sentence of this paragraph by request. It reads, "Through a Memorandum of Understanding between WSDA and Ecology authority for enforcement of discharges to waters of the state under 90.48 RCW is now shared with WSDA for livestock related activities."

Response - These changes and additions have been made to the document.

7. - page 13, "Table 3 – Implementing Agencies, Organizations", the following italicized changes and additions were suggested:

In the column Abbreviation, change DOA to *WSDA.*

In the column Authority/Responsibility, relating to WSDA, add a title *Enforcement* with the following description; *Enforce state Water Pollution Control Act (RCW 90.48).*

In the column Sources, relating to WSDA add, *and unpermitted livestock.*

In the column Performance Measures, relating to WSDA add, *and complaints for other livestock operations (see Appendix A)*

In the column Authority/Responsibility, relating to WCD add, *implementation.*

In the column Performance Measures, relating to WCD add, *updated dairy plans as needed by operational changes.*

Response - These changes and additions have been made to the document.

8. - page A-3, under the title, "Appendix A: Quarterly Implementation Schedule", the sentence now reads, "The *dairy* inspection targets are for an annual average, some quarters may have more than the average quarterly target inspections."

In the column entitled "Goal", as well as the column entitled "Result" it was suggested that sub-categories for Number of Inspections be *Dairy* and *Other.*

Response - These changes have been made to the document.

9. - A sentence at the bottom of Table A.1 read, “The septic inspections are based on the number of septic systems in the Johnson Creek watershed, anticipated referral by Ecology, and other agencies.”

Response – This sentence has been deleted.