

Drayton Watershed Improvement District

Agenda for: September 20, 2016 Meeting, 3 pm – 5 pm

Ag Central 1796 Front Street Lynden, WA 98264

I. Consent Agenda

A. Review and Approval of July 19 Minutes

B. Financial Report and payment of bills

	<u>Amount</u>	<u>This Month</u>	<u>Total</u>	<u>Available</u>
Grant #1	\$0.00			\$0.00
2016 Assessments Received		\$24,062.98		
Fund Balance @ 8/1/2016		\$23,246.16		
Fund Balance @ 9/1/2016		\$23,407.48		
Accounts Payable				
Invoices Submitted for reimbursement				
TOTAL Available				\$23,407.48
Outstanding bills:				\$5,490.20
Ag Water Board	Sept AWB, RTJ Easement		\$2,799.20	
Enduris	Insurance		\$2,691.00	
End of Month Balance				\$17,917.28

	<u>2016 Budget</u>	<u>Expended</u>	<u>Balance</u>
AWB	26,012	12,625.96	13,386.04
Projects	12,000	750.00	11,250.00
Adm/Insurance	6,298	3,531.00	2,767.00
	38,012	16,906.96	27,403.04

II. Old Business

A. Ag Water Board report

- 2017 Workplan and Budget
 - Water quality/drainage
 - Water supply
 - Media Relations
 - Legal
 - Admin and misc fund for partnership requests
- Legal
 - Lummi Settlement Update (possibly in Executive Session)
- AWB Issues Summary – for County Council education

IV. New Business

A. Administrative

- Budget planning for 2017 – assessment rates
- Annexations?
- Nominations – Rod & Greg
- Legal Notice

DRAFT PUBLIC NOTICE – all Watershed Improvement Districts

Residents within the Bertrand, Drayton, Laurel, North Lynden, South Lynden, and Sumas Watershed Improvement Districts have an opportunity to:

1) Nominate candidates for election to the Board of the District – one position in Bertrand, two in Drayton, two in Laurel, two in North Lynden, two in South Lynden, and two in Sumas – candidates must file with the secretary of the district a declaration in writing of their candidacy, or a petition of nomination signed by at least ten qualified electors of the district, not later than five o'clock p.m. on the first Monday in November.

2) *Inspect the 2017 Assessment Role and represent your interests to the District Board which will serve as a Board of Equalization. Equalization issues in the Bertrand will be heard at 2pm, November 1st, for Sumas at 1pm, November 8th, for South Lynden at 3pm, November 8th, for Laurel at 10am, November 14th, for North Lynden at 10am, November 15th, and for Drayton at 3pm, November 15th, all at the District's office. The Assessment Roles for all Districts are available for inspection from October 11th to November 15th.*

Nomination forms and the assessment roles are available at the Districts' offices located at 1796 Front Street, Lynden.

Public Notice must be published in Lynden Tribune October 12, 19, 26

B. Ditch & Dike Maintenance

- Programmatic Drainage Permits
- WCD Grant application

The Whatcom Conservation District (WCD) will create a staff position to recruit and implement priority conservation projects targeting Natural Resources Conservation Service (NRCS) funding. Projects meeting the objectives for NFWF's Pacific Salmon Program Priority Area will be targeted for funding farm bill programs. This effort will better integrate and publicize NRCS and other funding programs into the rural and agricultural community resulting in higher priority and more strategic projects. Targeted projects will benefit endangered salmon by increasing summer instream flows and improving water quality. Projects will also provide benefits to tribal shellfish farmers whose subsistence, ceremonial and commercial beds were recently closed due to poor water quality at the terminus of the Nooksack River in northwest Washington. Six Watershed Improvement Districts (WID) were recently formed to coalesce the farming community into functional groups able to take action concerning water quantity and quality issues on the 120,000 acres of commercial farmland in Whatcom County. Although the Nooksack River watershed is identified as one of the highest priority areas for salmon recovery funding, the WIDs have not yet found a niche in the recovery arena. This project will provide the WID leaders and individual landowners a dedicated and experienced coordinator to provide the technical assistance needed to get more conservation on the ground.

C. Water Quality

- Water quality testing results
- Exact Scientific – source tracking technology
- Report on landowner contacts

D. Water Quantity – explanatory diagram

- Whatcom Water Supply Coalition
 - goals, objectives, and actions
 - shared legal expenses
 - Review of Water Rights and Needs for each WID
 - Water Bank – part of the BOR and the Birch Bay Water District grant
- Birch Bay Water and Sewer Deep Aquifer project
 - Phase 1 contracts
 - Phase 2 contracts and drilling
- Bertrand's Surface to Ground conversions and Augmentation projects
- Ag's Role in the developing Interlocal Agreement (ILA) for WRIA #1 Water Planning

E. Education

- WCD Speaker Series proposal
- AWB/WID Newsletter
- Website www.draytonwid.com

F. Comments on Conservation District 2017 Workplan

G. Other Items from Commissioners

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IV. Adjournment/Next Meeting

October 18

Drayton Watershed Improvement District

Minutes for: July 19, 2016 Meeting, 3pm – 5pm

Ag Central 1796 Front Street Lynden, WA 98264

☒ Rod Tjoelker ☒ Scott James ☒ Marty Maberry
☐ Jeff Bedlington ☒ Greg Ebe

☒ Henry Bierlink ☒ Dale Buys ☒ Chuck Lindsay
☐ Gary Stoyka ☐ Steve Jilk ☐ Kasey Cykler
☒ Heather MacKay ☒ Dan Eisses ☒ Fred Likkel
☒ Fred Brown ☒ Rud Browne ☐ David Haggith

x = present

o = absent with notice

t = teleconference

I. Consent Agenda

A. Review and Approval of May 31 Minutes

B. Financial Report and payment of bills

	<u>Amount</u>	<u>This Month</u>	<u>Total</u>	<u>Available</u>
Grant #1	\$0.00			\$0.00
2016 Assessments Received		\$23,843.41		
Fund Balance @ 6/1/2016		\$30,218.51		
Fund Balance @ 7/1/2016		\$28,639.67		
Accounts Payable				
Invoices Submitted for reimbursement				
TOTAL Available				\$28,639.67
Outstanding bills:				\$5,451.76
Ag Water Board	June/July AWB		\$5,451.76	
N3	Water Quality testing			
End of Month Balance				\$23,187.91

	<u>2016 Budget</u>	<u>Expended to Date</u>	<u>Balance</u>
AWB	26,012	10,576.76	15,435.24
Projects	12,000	0.00	12,000.00
Adm/Insurance	6,298	840.00	5,458.00
	38,012	11,416.76	32,893.24

Greg moved to approve the Consent Agenda, Rod seconded, motion carried unanimously.

II. Old Business

A. Ag Water Board report

- Legal
 - Lummi Settlement Update (in Executive Session)
 - Critical Area update – comments on CAO in cooperation with WFF and Farm Bureau – The Council will be considering the CAO this Fall. The Farm Bureau may be coming to the WIDs for more financial support but have been asked to present a budget indicating what is needed for what activities.
- Insurance
 - Options to stay with Enduris or switch to CIAW (attached quotes)
 - CIAW insures AWB with named WIDs, Enduris each WID with named AWB
 - Bill Clarke was more comfortable with the Enduris approach.
 - The Board was inclined to agree to remain with Enduris.

III. New Business

A. Ditch & Dike Maintenance

- Ditch maintenance – Frank Corey has looked at the drainage issues on Enterprise, north of the Fire Station. Greg will talk with Public Works about the Lynden Birth Bay ditch which was routed to Schneider but more logically flows to Dakota.

B. Water Quality

- Water quality testing results – Fred noted only one high count in recent months which was an aberration.

C. Water Quantity

- Whatcom Water Supply Coalition
 - Working on a clear plan with goals, objectives, and actions
 - A Strategy will be reviewed and adopted at a meeting later this week.
- Bureau of Reclamation Grant
 - Review of Water Rights and Needs for each WID
 - Water Bank – part of the BOR and the Birch Bay Water District grant
- Deep Aquifer –
 - interlocal agreement with Birch Bay Water & Sewer – Dan reported that the City of Blaine will take more time to be included so the agreement will be with just the two parties.
 - Phase 1 contract with landowners are ready. Site #1 is still to be negotiated.
 - Draft Phase 2 contract with landowners has been prepared.
 - Dan reported he hoped to drill sites #1 and #2 at roughly the same time. Site three would be selected after learning from the initial drills. He hopes to have RFP for drilling out August 1st and bid approval on the 24th.
 - Discussion of the need for a regional entity to manage the water generated in this and other projects.
- Ag's Role in the developing Interlocal Agreement (ILA) for WRIA #1 Water Planning will be discussed at a July 28th meeting of the Joint Board. Marty indicated he would be willing to attend.

D. Education

- Review of Mapping Project – final report from County team – Heather highlighted some portions of the Report and a draft Storymap noting the stories all the WIDs generated in this planning and mapping project.
- Greg noted that while this project provided data the WID still needs to put the data to use by developing a Strategic Plan. A worksession this winter was suggested.
- Website www.draytonwid.com

IV. Adjournment/Next Meetings

August 16 September 20 – August meeting likely to be cancelled.

Respectfully submitted by Henry Bierlink, Ag Water Board

Approved by _____

Suggested 2017 AWB Budget

<u>WID</u>	<u>Acres</u>	<u>%</u>	<u>Office/ Misc</u>	<u>Admin</u>	<u>Legal</u>	<u>Water Supply</u>	<u>Quality & Drainage</u>	<u>Public Affairs</u>	<u>TOTAL</u>
Bertrand	14,393	21.3%	\$5,321	\$10,642	\$15,963	\$10,642	\$7,982	\$7,982	58,531
North Lynden	5,915	8.7%	\$2,187	\$4,374	\$6,560	\$4,374	\$3,280	\$3,280	24,054
South Lynden	13,086	19.4%	\$4,838	\$9,676	\$14,514	\$9,676	\$7,257	\$7,257	53,216
Drayton	7,385	10.9%	\$2,730	\$5,460	\$8,191	\$5,460	\$4,095	\$4,095	30,032
Laurel	8,307	12.3%	\$3,071	\$6,142	\$9,213	\$6,142	\$4,607	\$4,607	33,782
Sumas	18,537	27.4%	\$6,853	\$13,706	\$20,559	\$13,706	\$10,280	\$10,280	75,384
			25,000	50,000	75,000	50,000	37,500	37,500	275,000
	67,623.0		9%	18%	27%	18%	14%	14%	100%

<u>WID</u>	<u>Rate</u>	<u>AWB</u>	<u>Insurance/Misc</u>	<u>Projects</u>	<u>TOTAL</u>
Bertrand	\$6	58,531	4,191	23,636	86,358
North Lynden	\$4	24,054	1,618	-2,012	23,660
South Lynden	\$6	53,216	4,191	21,109	78,516
Drayton	\$6	30,032	3,691	10,587	44,310
Laurel	\$6	33,782	3,691	12,369	49,842
Sumas	\$5	75,384	4,191	13,110	92,685
		275,000	21,573	78,798	375,371

increase of \$39,000 to AWB Legal - \$36k to \$75k

increase of \$10,000 to Office -supplies, utilities, rent, etc., add misc for unplanned expenses

2016

<u>WID</u>	<u>AWB</u>	<u>Insurance</u>	<u>Projects</u>	<u>TOTAL</u>
Bertrand	48,140	2,650	35,568	86,358
North Lynden	19,837	1,600	2,287	23,724
South Lynden	43,451	2,650	31,845	77,946
Drayton	24,700	2,650	16,960	44,310
Laurel	27,784	2,650	19,408	49,842
Sumas	62,087	2,650	28,078	92,815
	226,000	14,850	134,146	374,996

2015

<u>WID</u>	<u>AWB</u>	<u>Insurance/Adm</u>	<u>Projects</u>	<u>TOTAL</u>
Bertrand	23,000	16,771	99,468	139,239
North Lynden	0	3,933	1,295	5,228
South Lynden	21,620	9,015	1,788	32,423
Drayton	8,620	6,530	0	15,150
Laurel	12,277	8,038	0	20,315
Sumas	27,346	8,765	4,152	40,263
	92,863	53,052	106,703	252,618

Whatcom Family Farmers
Position Statement

Why Addressing Water Issues is Critical to the Future of Family Farming in Our Community

Section One: Farming in Whatcom County

Farming has long been an important occupation for residents of what is now Whatcom County, dating back to pre-European days. When the Europeans arrived, clearing the land to grow crops was a major effort. Farming changed through the years but maintained its place as one of Whatcom County's largest and most important economic activities.

Farming, Jobs and the Economy

In the early 1900s, nearly 50% of all citizens lived on the farms and participated in growing food. Today, about 1% of the population feeds the other 99% of non-farmers. In Whatcom County, with a population of a little over 200,000, there are just around 300 farmers who are professional or full-time farmers. We have almost no farms owned by corporations. Nearly all are family farms going back two, three, four generations and even more.

The value of farm products as they leave the farm is over \$325 million. That translates to an economic impact in the county of well over \$1 billion, which is about 15% to 20% of the county's economy.

Traditionally dairy farming has been the largest segment of Whatcom County's agriculture and it remains a significant part with a product value leaving the farm of about \$250 million. However, the number of dairy farms has declined significantly to less than 100 today from over 3000 in the early 1960s. The number of cows has declined as well from about 60,000 twenty years ago to about 41,000 in 2016.

Berry farming has grown rapidly in the past decade with now more than 165 berry farmers. Growth in blueberry production has reached the levels of raspberry production. Ideal soil and

weather conditions, plus a multi-generation tradition of berry growing has resulted in Whatcom County producing 75% of the nation's crop of red raspberries.

Seed potatoes are also a major farm product with the unique climate and soil conditions well suited to this product. Whatcom County is known for producing the highest quality seed potatoes coming from a handful of major producers. There are also seventeen nursery and greenhouse growers in the county.

Challenges to Farming

We cannot assume that Whatcom County will continue to be a highly productive farming area and that the environmental, community and quality-of-life benefits offered by farmers will continue. There are significant challenges and risks and farmers are now understanding that the support of the community and elected leaders is essential to ensure a future for family farming in our community.

The "good old days" are not coming back

Farming today is very different from what it was in the 1950's and 60's. During those decades the federal government was funding the Soil Conservation Service to help farmers drain wetlands. There was no environmental movement, no activists lawsuits, no debate over tribal treaty rights, and non-farmers in our major cities were more knowledgeable and less critical of farming. Today's disconnect between consumer and producer of food represents the greatest underlying threat.

More and more decisions about farming and the future of farming are made today by voters in the urban centers who have little knowledge of farm practices and environmental stewardship and whose opinions of farmers are heavily influenced by activists with anti-farm agendas. They may support small farms of the Farmer's Market scale, but farms needed to efficiently produce food for a global population of over seven billion are increasingly criticized. Farmers today are beginning to understand that there is a public license to operate and to maintain that farmers need to adapt and change and, at the same time, work hard to educate the public and policymakers. Issues of concern to non-farmers need to be addressed including farmer

stewardship of the environment including water, animal care, food safety, labor practices and land use.

Farmer Unity Essential to Meeting the Challenges

Farmers are independent by nature and tend to focus on the individual challenges facing their own farming operations. But, the changes in the public policy arena and the related challenges to the future of farming have led farmers in Whatcom County to form organizations and structures aimed at facilitating joint action. While the Drainage Districts formed many years ago to address the specific issues of drainage and flood management, the Watershed Improvement Districts are relatively new. The Bertrand Watershed Improvement District was formed in 2000 2003(?) to address specific watershed issues in the Bertrand Creek drainage. The North Lynden Watershed Improvement District followed this example in 2007 followed by -In 2014, an additional five- four new Watershed Improvement Districts were formed in 2014. -

Watershed Improvement Districts are local government entities formed and controlled by the farmer/landowners within the District. This structure allows them to collaborate on projects, generate funds needed for projects and secure grants. The Watershed Improvement District structure includes a coordinating board made up of members of each of the Districts, called the Ag Water Board. It is this six member board which typically represents the farm community in government to government negotiations.

The Ag Water Board recognized the need for public engagement to address the challenges facing farmers in our community. This includes public education, community outreach, enhanced media relations, a strong social media presence, and communication aimed at correcting false information often used by anti-farm activists to generate public concern about farming practices. In mid-2015 the Ag Water Board invited the Whatcom County Dairy Federation, already engaged in a public outreach effort, to join together in a unified public communication effort which became Whatcom Family Farmers (WFF). This is a separate non-profit organization, with 501(c)3 and 501(c)5 status with a board consisting of eleven active family farmers and two non-voting farm supporter board members. Board members are appointed by the Ag Water Board and the Whatcom County Dairy Federation. Whatcom Farm Friends dissolved its 501c5 division at the end of 2015 and its 501c3 arm was transitioned into WFF – Education, governed by the newly established WFF Board.

Section Two: Whatcom Farmers and Water

While there are many issues that may affect the future of farming in Whatcom county, water issues are currently the most pressing and urgent. These issues include:

- Water Access - who has the rights to use water? Is there sufficient supply to meet the various demands on it, even during the drier summer months?
- Water Quality - how do we meet community expectations, state and federal laws and regulations and tribal treaty rights for clean surface and groundwater while maintaining viable farm operations?
- Drainage & Flood Management - how do we get excess water off our land in critical growing periods?
- Fish Habitat - How do we meet the community's expectations, laws and regulations, and tribal treaty rights to provide fish habitat needed spawning, rearing, and passage requirements?

Water Access

The issue of water access involves legal water rights, sufficient supply and competing demands.

Legal water rights

Farmers need a water right to provide water for their stock, irrigate over one half an acre, or to irrigate any "commercial" crop. The state manages legal water rights through the Department of Ecology.

The water right specifies the amount of water users are allowed to withdraw at any given moment, the total amount that can be withdrawn each year, the purpose of the withdrawal, the location of the withdrawal, the fields that may be irrigated, and the time of the year water may be used. Any violation of these parameters, over the lifetime of the right, puts the water right at risk. Water rights do not come with title to private property which means they have to be applied for separately from the State. If a water right has been approved it stays with the property through a property sale. There is currently a provision for an exemption from needing to apply for a water right for providing water for farm animals and for a single house using 5000 gallons or less per day. That exemption is a controversial political and legal issue without assurance of it being continued indefinitely.

Early Whatcom County irrigators normally pumped water from streams and the Nooksack river, called surface water. Most surface water users had obtained water rights once the code went into effect in 1917. In 1945 the state determined a water right was needed for withdrawal from wells with the exception of stockwatering and domestic use under 5000 gallons per day.

Water claims vs. rights

In the past, farmers who applied for water rights normally received them without much difficulty. Because of the casual nature of early water rights there is an incomplete record of who has rights and who doesn't. Adding to the confusion was a Statewide Claims Registry in the early 1970's. This asked all water users, including those holding water rights, to register a "claim" for water they were using or planned to use. Many landowners produce a claim certificate and incorrectly believe it is a legal water right. To convert a claim to a legal water right, the claim has to be supported with documentation that the source was from surface water prior to 1917 or groundwater prior to 1945 and that since then the water has been used continually.

Comment [HB1]: Not necessarily true. Eliminate.

In-stream flow rules

Water gained increased attention in the 1980s and 1990s with the establishment of an In-Stream Flow water right in the Nooksack River and its tributaries in 1985. This is a water right like any other with a 1985 priority date. The process determined the desired flows in these streams throughout the year and closed streams from further appropriations (withdrawals) when these flows were not met. Consequently, nearly all streams in Whatcom are now closed.

Ecology's Nooksack Rule stated that irrigators could use groundwater where surface water was not available. Because streams are now closed because of the rule, this would shift irrigation use from surface water (streams and river) to groundwater wells. However, the issue of hydraulic continuity interfered with that change.

Hydraulic continuity and impact on groundwater use

Hydraulic continuity is the term used to describe the connection between groundwater and surface water. The issue of water access was made far more complicated by the Department of Ecology's changing interpretation of just what "hydraulic continuity" means and court cases affirming Ecology's authority to deny groundwater applications if the groundwater is in hydraulic continuity with a closed surface water. Now, the so-called "one molecule" test means that groundwater applications must be treated in nearly the same manner as surface water rights pumping directly from a closed stream, even though the existence, timing, and extent of impacts ~~would could~~ be drastically different. It would be nearly impossible for any groundwater withdrawal in our shallow aquifers to meet Ecology's test, even though groundwater could be used in ways that minimize or eliminate impacts to streamflows at key times during the year.

This interpretation is a major issue in securing legal rights as groundwater and surface water use are treated as if both impact streamflows in the same way. Current science does not support this position as it is known the actual impact of groundwater on stream flows is related to location, distance, soil and weather.

Tribal treaty rights and water ~~water~~ access

In 1992 the Lummi Nation and Nooksack Tribe gave notice they were asking the federal government to "quantify" the amount of water that should be protected in the Nooksack system to protect the right to a viable fisheries that was provided to them in the 1974 "Boldt Decision." They argued that to be given control over the management of half the salmon implied that the tribes would have the legal protection for needed flows and habitat to maintain a healthy fishery. This claim has never been fully litigated but several recent court cases suggests their argument is strong.

This action caused considerable concern among Whatcom County farmers, prompting them to apply for legal water rights with the Department of Ecology. Over 400 applications were submitted in a short time. These applications have not been acted upon and the uncertain legal status that may affect well over half of current farmers represents a significant threat to the future of farming. This threat is heightened by some activists in the community who inappropriately accuse these farmers of water theft.

Sufficient water rights exist

Despite the many concerns plus the political challenges, farmers believe that sufficient water rights exist without requiring the assignment of additional rights. For example, major rights holders such as the City of Bellingham, are not using and will not need the very large water rights they have been granted. This is largely due to the closure of the industrial facility, the Georgia Pacific pulp and paper mill, that used more than three times the amount of water required for all the citizens and other commercial and industrial operations in the City. Other major water rights holders, such as the Public Utilities District, may not need all the water they are provided within their rights. Flexibility in assignment of rights is needed to address this important issue.

Water supply

The water rights issue is dependent to a large degree on the available supply of water. Whatcom County is an exceptional place for farming in part because of an abundant supply of water. This comes from rain which can be as high as 80 inches per year or more in some parts of the county, as well as snow which accumulates often in record numbers on nearby Mount Baker. The snowmelt contributes to stream flows throughout the year, less in the drier summer months as it always has been. The abundant water also causes problems with drainage and flooding as will be discussed below.

Following the In-Stream Flow rule, farmers' use of water focused on groundwater. The aquifers, the vast underground reservoirs that hold our groundwater, are massive. The Abbotsford-Sumas aquifer is huge, one of the largest in the entire region. It covers an area of at least 77 square miles with about half in Canada and half in northern Whatcom County. This aquifer typically holds an estimated 257 billion gallons of water. Unlike a number of other aquifers in

other places in the nation where farming is active, this aquifer is fully recharged every year. Every drop withdrawn by Canadian and Whatcom County groundwater is replenished with the 32 to 60 inches of rain that fall each year in this area. However, as large as this aquifer is, it is fairly shallow. Other aquifers in northern Whatcom County are far deeper with much of their water also flowing from Canada.

We also have abundant surface water for most of the year. The water that flows down the river mostly comes from the snow in the Mount Baker area. Information available from the USGS indicates that the flow in the Nooksack River on average is about 2.5 billion gallons per day, or approaching 900 billion gallons per year.

Farmers estimate use at about 15 billion gallons annually. If all farm use came from the Nooksack river alone it would amount to about 1.6 percent of the annual volume of water in the river. Activists making claims about the impact of irrigation point to historic low flows in the Nooksack river but fail to mention that these historic lows include flows in the North Fork which is not and never has been used for irrigation. Still, less and less is taken from the river and farmers are working to end any stream withdrawals in favor of groundwater withdrawals. If all farm water was taken from the existing aquifer, it would withdraw about six percent per year but this would not reduce the recharge meaning that six percent would typically be replaced annually. We need to remind our leaders and citizens that while California water officials are looking to divert water from stream sources to store it in large underground aquifers, our aquifers are already filled to the maximum and recharged to overflowing every year.

Despite this abundance of water, there are concerns about long term supply. Some activists have even claimed we have a water crisis. While climate change, a growing population in the lower mainland of British Columbia and Whatcom County, and farm irrigation needs are factors in this concern, the primary concern is driven by tribal treaty rights and environmental issues.

Currently, a government-funded study is underway in ~~the~~ a large aquifer in northwest Whatcom County which could supply a large amount of additional water. Some note that the Nooksack river is one of the few major rivers in the state that does not have seasonal storage. Farmers are supportive of exploring additional water supplies particularly given the uncertainty of water rights. Securing plentiful supply for fish, farms and growing families may be one part of the solution to meeting everyone's needs for water.

Conservation and the relinquishment law

One of the easiest and least costly ways to assure adequate supply is through conservation. Farmers have made very significant strides in water conservation. Dairy farms use an estimated 60% less water than just a few decades ago and most berry farmers have installed micro-irrigation which greatly increases water efficiency. However, farmers face a unique disincentive to conserve water in the now out-dated relinquishment law.

Otherwise known as the “use it or lose it law,” this requires farmers to use the full amount of their water right for “beneficial” use at least once every five years or risk losing their right. They must document that beneficial use and provide records to the state. Intended to allow unused rights to be given to those who need it, the law uniquely affects farmers as municipal water rights holders are not subject to the same law. Attempts in the past to update this law dating back to 1917 have not been successful. But unless the law is changed, farmers’ willingness and ability to conserve even more water will be limited by this outdated legislation.

Water access solutions

Tribal treaty rights, growing populations on both sides of the border, the high value placed on environmental protection and habitat restoration all place demands on water and may impact the ability of farmers to have the water they need to continue to farm here in Whatcom County.

Whatcom family farmers have demonstrated repeatedly their commitment to resolve water issues involving all users, not just farms. The Watershed Improvement Districts were formed over a number of years to enable farmers to work together on projects specifically to improve water supply, in-stream flows, habitat improvements and water quality improvements. As an example, farmers have been involved in stream augmentation using their unused water rights to pump groundwater to streams at critical times of the year to improve the stream flows needed for fish.

Farmers believe the best way forward is through bringing the various parties together for comprehensive discussions. In this process, no one party can expect to get all they want. Compromise is essential. Failing that, the courts or national or state legislatures will decide the

fate of water for farming, fish and a growing community with community and tribal leaders losing all say in the matter.

Water Quality

Humans have been farming for over 10,000 years. Farming almost always impacts the environment and often it impacts water quality. The challenge of farming today is to meet the food requirements of over seven billion people while minimizing impacts to the environment, and even mitigating the residual impacts of generations of farming where impacts were less understood and of little concern. While there are specific water quality concerns related to farming activities, it should be noted at the outset that the 100,000 plus acres of farmland in Whatcom County play a critical role in protecting water. Rainwater is filtered through the fields and open land providing an important cleansing effect in water that is increasingly impacted by a rapidly growing population, including the million plus residents in Canada that share our aquifer and some of our streams.

Surface and groundwater quality issues

Water quality has taken front and center in the issues involving the present and future of farming in Whatcom County, largely because of the closures of the Lummi Nation shellfish beds and the resulting regulations and threats of legal actions arising from those closings. These issues revolve around bacteria contamination of surface water that flows through ditches, streams and into the Nooksack river where some of it affects the Portage Bay shellfish beds.

But bacteria and surface water concerns are not the whole story. Nitrates in drinking water have long been associated with a serious disease, methemoglobinemia, affecting infants who use well water high in nitrates with infant formula. While updated science reports show the link between nitrates and “blue baby syndrome” is questionable, the EPA’s standard remains at 10 parts per million, a standard that is not met by about 25% of the wells in northwest Whatcom County where many farms are located. Reducing nitrates and preventing leakage into groundwater is behind much of the regulation and criticism aimed at farming practices, particularly involving dairy farms.

There are other issues of concern when you get past bacteria and nitrates, including surface water temperature and the impact on fish and pesticide drift. In the past, streams were cleared of brush and vegetation and woody debris to maximize available farmland. Now we know that those practices were harmful to fish. Consequently, Whatcom family farmers have been leaders in the incentive-based efforts to provide fish habitat, vegetative buffers and other improvements to our streams. Through the Whatcom Conservation District, Whatcom farmers have contributed to over 170 miles of stream buffers and helped in planting well over one million trees and shrubs along our streams.

Pesticides

Issues related to pesticide use affect primarily berry, potato and other crop farmers. Dairy farmers are typically not users of pesticides. Pesticide application is carefully regulated by the Washington State Department of Agriculture which requires all applications to be done according to the labels on the products approved by EPA. Both federal and state laws strictly regulate the pesticides to be used and how they are to be applied. Only trained and licensed applicators can apply pesticides and records of all applications are kept and inspected by the State. In addition, many farms are planting filter areas around their fields to reduce or eliminate possible drifting.

Concerns about pesticide residue in drinking water were raised a number of years ago. A few areas of the county were identified as having groundwater contaminated by an old generation of pesticides that were taken off the market decades ago. This pesticide, known as EDB did not break down as rapidly as current pesticides are designed to do. The areas where EDB showed up are now served by municipal water sources. Because of this, there are no continuing concerns with this and there is no indication of similar issues arising.

Fecal coliform or bacteria contamination in surface water

Bacteria in surface water is normally referred to as fecal coliform. Fecal coliform, as the name suggests, is bacteria from the gut of warm-blooded animals. However, the tests for bacteria referred to as fecal coliform also include bacteria from other sources including *klebsiella*. This bacteria is from decomposing organic material including rotting trees and brush, sawdust and

other organic material. While this bacteria can be a significant issue in some situations, the focus in water quality is bacteria from animals and humans.

The closure of the Lummi Nation shellfish beds in the mid-1990s raised significant concerns about bacteria contamination coming from dairy farms. This led to the passage of the 1998 Dairy Nutrient Management Act with the requirement to provide farm plans that specify how and when manure nutrients are applied to fields. The restrictions were aimed at reducing runoff into streams as well as reducing the over-application of nitrogen from the manure that can contribute to nitrate contamination of groundwater. When the Department of Ecology, originally charged with enforcing the nutrient management regulations, cut the dairy farm inspection program from their budget in the early 2000s, the dairy industry through the Washington State Dairy Federation sought funding to continue the inspections through the Washington State Department of Agriculture.

Comment [HB2]: Is this correct? Check. My impression is that dairy was not happy with the nature of Ecology inspections and choose to get the Legislature to transfer the program to WSDA.

The success of the regulations and enforcement in reducing bacteria from surface water was documented through water quality tests and noted in the 2008 Lummi Atlas, which credited these measures with the reopening of the shellfish beds in 2006 (?). The significant improvement in water quality documented beginning around 2002 began to change in 2013 and by late 2014, some of the shellfish beds were again closed due to increased bacteria. While some concluded that dairy farms must once again be to blame, water quality studies showed that the increase was due to multiple causes. These include changing weather conditions, reduction of salinity in Portage Bay, a rapidly growing suburban population with numerous on-site septic systems, significant increases in wildfowl populations, increase in hobby farms with horses and cattle, improper use of manure by non-dairy farmers and continuing lower level contributions from dairy farms. The consensus of those involved in monitoring and improving water quality is that urban stormwater runoff from the towns and cities along the Nooksack river and significant contamination events from Canada are the likely primary causes of the current higher levels of contamination leading to the shellfish closures.

Comment [HB3]: I don't think this is true. While each of these items are clearly contributing factors the consensus of those with full knowledge of the loading risks will still point to animal ag as the largest potential loading risk. Denying this fact does not advance our arguments.

Dairy farmers continue to work hard to improve water quality through compliance with regulations, proactive investments beyond regulations and active involvement in addressing all sources. The Department of Agriculture reports nearly 97% compliance of dairy farmers in the state with regulations and identifies just 3% of all dairy crop acreage as needing attention due to higher than allowed levels of nitrates. Beyond regulations, many farmers have made significant

investments in environmental measures including installing biogas digesters, manure management infrastructure aimed at reducing accidental releases, farm waste water capture systems and much more. Farmers also are active participants in the county's Pollution Identification and Correction program both through individual farm water testing and through the Watershed Improvement Districts. Through the Ag Water Board and Whatcom Family Farmers, the farm community has been actively involved in addressing all potential contamination sources, working to help compensate shellfish fisherman who experienced financial loss, and engaging with tribal, local and state officials to find coordinated and comprehensive methods to reduce bacteria contamination and secure the permanent re-opening of the Portage Bay shellfish beds.

Comment [HB4]: Good! Our argument needs to be that we understand the risk we pose and are actively engaged in addressing it. Accurate and uplifting!

Nitrates and groundwater contamination

There are several areas of the county where nitrate levels are above the ten parts per million EPA drinking water standard creating challenges for water associations and private well owners. Nitrate levels are affected by septic systems, manure and chemical fertilizer applications in excess of the crops ability to absorb the nitrogen, and numerous other sources including natural decomposition of peat areas. As already discussed farms have been paying much more attention to nutrient applications. Dairy farms are required to report nitrate levels in their soil and manage manure applications around these levels. Crop farmers are eager to reduce commercial fertilizer bills by managing more efficiently and avoiding over-application. Nitrate levels have been consistently dropping in farming areas due to these practices. On dairy cropland, for example, under 3% of land shows levels of nitrates beyond the regulatory application levels.

Manure lagoons are an essential part of the protection of groundwater and surface water as they provide manure storage during those times of the year when application is restricted due to weather conditions. Despite this, lagoons have become a focus of anti-farm activists and lawyers. In Yakima, lawyers affiliated with the Western Environmental Law Center, secured a highly controversial and questionable decision from a federal judge who determined that manure, despite being a valuable organic fertilizer, is to be considered "waste" and management of it determined by federal laws intended for the treatment of municipal waste. Federal legislation introduced by Representative Dan Newhouse of Yakima, would clarify that the Resource Recovery and Conservation Act does not include manure as waste.

Water experts agree that lagoons do not contribute significantly to groundwater contamination and studies by the Natural Resources Conservation Service shows that lagoons lined with proper soil and cured manure are protective of water quality. However, anti-farm activists are pressuring the Department of Ecology to require synthetic membrane liners on all lagoons as part of the Concentrated Animal Feeding Operation (CAFO) permit being issued by the Department. The cost of this completely unnecessary measure would force most dairy farms out of the state and force rapid consolidation of the remaining farms. Pressure from these lawyers and activists has resulted in the Department of Ecology adding more regulatory burdens on farmers, such as 100 foot buffers, that would significantly increase costs while doing little to nothing to protect water. Whatcom Family Farmers is working with the Department of Ecology to encourage them to provide a permit that would be protective of water without adding unnecessary new costs and regulatory burdens.

Drainage and Flood Management

Whatcom County's geology is characterized by the Cascade Mountains to the east and Puget Sound to the west. In between are prairies and ridges where our farm lands are located. Farming on the ridges was the early experience but as populations grew movement into the lowland prairies became necessary. The abundance of rainfall and high water table that contributes to our water supply requires most of the prairie and floodplain land requires some level of drainage to be productive. Nearly all our best farmland is classified "farmed when drained" by the Natural Resources Conservation Service. By 1915 Drainage Districts were in place in several portions of the County. There are currently ~~17~~ **14** functioning Whatcom Drainage Districts. **(need some explanation of their current function)** Other farmers made use of county road ditches as outlets for their private field ditches and tiles.

Maintaining drainage systems is a major concern for many Whatcom farmers. Without continual attention these systems will become blocked and non-functional resulting in flooded fields and saturated soils that reduce our growing season and take away the filtering capacity of the soil which is needed for water quality protection. Few issues frustrate farmers more than being denied the opportunity to keep drainage functioning. Maintaining drainage requires occasional ditch cleaning. Hydraulic Permits issued by WDFW are required to engage in ditch cleaning. In recent years WDFW has imposed a mitigation requirement for most ditch cleaning projects.

Mitigation often takes the form of stream restoration and tree and shrub planting. It has been difficult to gain support for these activities as many of the ditches requiring maintenance are along roads where the potential for restoration work is quite limited. (Where is this pressure coming from--can we be more specific here?)

Drainage, fish habitat or both?

One of the significant challenges facing family farming in our community is the shift in public policy changed from an emphasis on draining productive agricultural grounds to restoring habitat for fish and wildlife. There are abundant examples of where both farm productivity and fish habitat are provided. In some areas these win/win solutions are more difficult to achieve. What is needed is an agreement with farmers, fish biologists and resource managers where priority areas for both fish and farming are established and maintained. The Drainage Districts and the Watershed Improvement Districts are uniquely structured to develop, implement, and maintain these agreements.

Flood Management

Floods are not uncommon in Whatcom County and much has been done to prepare for them and minimize the risks of loss of life and property damage. Protective measures often involve using farmland to hold floodwater. The drainage methods discussed above then allow the farmland to return to productive use. Farmers need assurance that in return for holding floodwaters on farmlands farmers will be able to restore the drainage systems that are compromised by sediments from flood events. This needs to be done in a timely manner so growing seasons are not compromised.

Farms also recognize that the choice to dike rivers and streams requires consistent maintenance. Dikes need to be maintained and stream levels kept consistent in order to allow the county's drainage systems to operate correctly. Farmers are willing to partner with flood management agencies and fish habitat managers to pull back key dikes to alleviate flood pressures and create more habitat. As this often involves loss of productive farmland, these partnerships depend on the willingness of government agencies to compensate for these losses with improvements in productive capacity elsewhere. Again, the Watershed Improvement

Districts provide an appropriate structure for a unified farm community to work cooperatively with the officials charged with flood protection, fish and wildlife habitat, and the environment.

Fish Habitat

Farmers want to see a return of salmon runs to our county streams and rivers. For our friends and neighbors of the Lummi and Nooksack tribes, salmon is an essential part of their history, traditions and culture. They want to pass on to their children the legacy and values of the fishing culture as farmers want to pass to their children the legacy and values of the farming culture.

Habitat restoration is one necessary part of restoring salmon. It is now understood that in a time of seemingly endless abundance of the natural resources, including fish, choices were made in the 19th and early 20th to clear, drain and irrigate the productive soil to grow food, and those choices often resulted in loss of the habitat needed for fish.

There are those who wish to turn the clock back to the 1850s before the start of European settlement in this part of the world. They wish to see our farmland returned to pre-settlement woods and wetlands, eliminate flood protection measures and drainage, allow rivers and streams to flood and meander at will, and end or severely restrict irrigation. Farmers do not believe in this lose/lose approach. Farmers know that is very possible to have the fish necessary for the tribes, farms necessary for growing food and environmental protection and still have room in our community for growing families and a growing population.

Most of what has already been discussed in this position paper relates to fish habitat. Bacteria contamination affects fish, particularly shellfish. Buffers and riparian zones are essential for fish habitat in keeping water clean, providing shade to control temperature and restoring stream features needed for spawning and healthy fish populations. Maintaining adequate flows is part of this requirement. Certainly, lower stream flows in the drier summer months is a fact of nature only partially impacted by use of irrigation water. Farmers, through the Watershed Improvement Districts, have been working to use excess water rights to augment stream flows in critical late summer months when stream flows are lowest. Farmers are also working to convert existing surface water rights which allow for withdrawals from streams and rivers to groundwater rights -- a process hindered by the unresolved issue of hydraulic continuity. Farmers have also been

leaders in the Conservation Reserve Enhancement Program of the Whatcom Conservation District which reports nearly 400 projects, with about 2700 acres planted, almost 200 miles of Whatcom streams restored, and over 1.2 million trees and shrubs planted.

Efforts to cooperatively work with tribal leaders on these issues have been hampered by anti-farm activist lawyers who have repeatedly claimed that agriculture pollution is the primary cause of loss of salmon. The scientific basis of this claim is contradicted by all serious studies of water quality, pollution and the causes of the decline of salmon stocks in the Pacific Northwest. These studies focus on the four H's of decline: Hydropower, Harvest, Habitat, and Hatcheries. While farming has impacted habitat, certainly farming provides habitat protection not afforded by urban and semi-urban development. That's why farmers think it ironic that those seeking to reduce habitat loss work by forcing farmers out of business through laws, regulations, and legal action will achieve the opposite effect if they succeed. Farmers with a strong commitment to be responsible stewards of the land and water offer the best hope for the restoration of habitat needed to support the return of salmon stocks.

Given the fact that habitat is one of the four H's and not the whole story of fish restoration, farmers are also supportive of other measures to address fish population. It is now believed that target-species hatcheries, those planting chinook and coho salmon, have been harmful to the return of wildstocks. However, farmers are encouraged by the example provided in Alaska of salt-water hatcheries that provide food for the target species of wild salmon. Farmers are also looking to increase their knowledge and engagement of other issues related to the return of salmon including harvest regulation and enforcement of those regulations.

Section Three: What Farmers Are Asking of Our Leaders and the Community

Here is a current listing of public policy positions advocated by Whatcom Family Farmers aimed at helping ensure a future for farming in our community. We are asking members of the community to become informed and involved in these issues. The future of farming will remain at risk unless our elected leaders clearly understand our positions and why the policies proposed by those opposing farms and farmers are so harmful. We urge the following activities:

- 1) Communicate directly to your elected representatives by phone, email, letter or webform. Contact information is provided at whatcomfamilyfarmers.org.
- 2) Communicate your views publicly through:
 - a) Social media such as Facebook
 - b) Comments on online news channels
 - c) Letters to the editor and guest editorials
- 3) Vote for leaders who understand the needs of farmers and support a future for family farming

Water Access:

Communicate your support of these positions to our elected leaders at the state and county levels:

- 1) Update the 1917 Water Code to encourage conservation by protecting farmers against losing water rights through the “use it or lose it” relinquishment law.
- 2) Support efforts to review and assign unused water rights to farmers who need them.
- 3) Support flexibility in farmer's use of water rights including transfers, scheduling, banking, etc.

- 4) Support transfer of existing surface water rights to groundwater rights where it can be demonstrated that groundwater withdrawals will not significantly impact stream flows.
- 5) Support and encourage a comprehensive government to government water agreement with the farmers through the Ag Water Board, the tribes, Whatcom County and the State of Washington.
- 6) Support state measures to study future long term supply sources for Whatcom County.

Water Quality:

Communicate your support of these positions to our elected state leaders:

- 1) Support farmer's efforts to modify the draft Ecology CAFO permit to be protective of water using solid science and to eliminate non-science positions harmful to farmers but pushed by anti-farm activists.
- 2) Express to the Governor's Office strong disappointment over the lack of response to request from County Executive Louws to request response from the BC Provincial Government regarding documented significant water contamination flowing from Canada.

Do what you can to protect our water:

- 1) If you have an on-site septic system make sure it is working properly
- 2) Pick up after your pets
- 3) Keep larger farm animals away from streams and ditches and make sure manure storage does not runoff to waterways
- 4) Participate in the voluntary efforts to expand stream riparian zones

Communicate your support to county and city leaders:

- 1) Let your city and county elected officials know that you support the current efforts to identify and address water quality concerns through the PIC program

- 2) Encourage continued support for on-site septic evaluation and repair, including identifying funding sources to help convert the 200 outdated septic systems within the City of Lynden to city sewers.
- 3) Communicate publicly and to elected officials that you consider the efforts of out-of-state lawyers and anti-farm activists within our own community to inappropriately blame dairy farms as the primary cause of bacteria contamination to be wrong and counter-productive to preserving farming, our environment and the essential quality of life of our community.
- 4) Communicate that efforts by some to protect water through massive buffers is not supported by science, will not aid in water protection, but is a tactic of anti-farm activists to take valuable cropland out of production and force farmers out of business.

Drainage & Flood Management

Communicate your support to county council members:

- 1) Efforts by some to weaken flood protection and restoration of drainage to protect fish habitat and the environment are unnecessary and counter-productive as ensuring the survival of farms and farmland provides best assurance of long term fish and environmental protection.
- 2) Protection of farmland by county policy is essential, and farmland cannot be protected if farmers are required to assume higher regulatory burdens and costs.

Fish Habitat

Communicate your support to county, state and federal elected officials:

- 1) Farmers ask local and state elected leaders to encourage a comprehensive approach to long term water solutions that involve tribal government leaders.

- 2) Farmers support the legislative action in the Washington State legislature to establish a pilot saltwater hatchery on Bellingham Bay to provide feedstock for target salmon species.
- 3) Farmers are eager to participate in discussions with tribal leaders and the state on further improvements to fish habitat provided these discussions incorporate all aspects of salmon decline and recovery.

Meeting Outcomes
ZAPS monitoring coordination meeting - August 17, 2016

Attendees:

- Ag-Water Board – Henry Bierlink
- Lummi Natural Resources – Jeremy Freimund, Alan Chapman, Kara Kuhlman, Jamie Mattson
- US Environmental Protection Agency – Steven Potokar, Anne Dalrymple, Lauris Davies, Fran Kremer (by phone)
- Whatcom Conservation District – Nichole Embertson, Scarlett Graham
- Whatcom County – Erika Douglas
- Washington State Department of Agriculture – Kyrre Flege, Ginny Prest
- Washington State Department of Ecology – Steve Hood, Jessica Kirkpatrick, Chris Luerkens
- Washington State Department of Health – Andrea Hood

(not present)

PUD No. 1 of Whatcom County

- Attendees were updated on the ZAPS Project with discussion focused on logistics, staff time and costs related to the current Ferndale ZAPS monitor.
- Attendees discussed how the Cooperative Research and Development Agreement (CRADA) works and clarified issues that should be addressed in the QAPP.
 - Partners agreed to sign the CRADA, with the understanding there are details that need to be worked out in the QAPP.
 - QAPP issues include: what will be the actual lab methods for testing the water samples – particularly E. coli, how often will grab sampling be done (to be identified in the QAPP, once a month was discussed), use of automatic samplers (ISCO) in event of an anomaly to provide quick grab sample response, need for a sampling “response procedure” downstream in the event of a monitor spike/anomaly, etc.
 - Whatcom CD will consider how they can participate in the CRADA from an education and outreach angle.
 - **CRADA finalization and execution timeline and logistics:**
 - Provide comments on draft CRADA to Steven Potokar and Fran Kremer by **August 26th**; feel free to include QAPP questions as well.
 - EPA will incorporate comments and circulate a last draft early in September and then a final version of the CRADA for signature by **September 16th** (Steven Potokar/ Fran Kremer)
 - Goal is to have all parties sign the CRADA by **September 30th** (CRADA Contributors)
 - CRADA questions and issues during can be directed to Fran Kremer (513) 569-7346.
- Attendees discussed requirements for the monitor sites (including power, clean water, security, minimum flow requirements etc.) and determined recommendations for monitor locations (and 3 alternates) which would be further studied by WSDA.
 - **Consensus selections: DD6, FT4, F2a, K1 (pending flooding question), S1.**

- Alternates in order: Berthusen Park (B-berthusen), Ten Mile Creek (T1), Mainstem Nooksack River at Everson (M5).
- Placement priority for the five additional ZAPS monitors may be driven by which site logistics can be worked out first vs. strategic sequential placement.
- After determining the final site recommendations, attendees will identify project partners who will manage each monitor location.
- Partners may investigate hiring a single party to service all of the monitors for consistency and be the first responder for alerts.
- We discussed the need to estimate (potentially significant) initial installation costs and O&M costs, as well as develop a plan to cover the O&M costs for 3 years. The group discussed potential access to Round 1-6 National Estuary Program (NEP) unspent funds to cover installation costs. Ginny Prest agreed to contact DOH's Jerrod Davis to explain need and gauge possibility of acquiring funding for the installations with any surplus funding allocated to laboratory costs for the grab samples. Based on response, Ginny (with staff) will develop a ball park list of site needs and estimate of costs.
- Attendees will discuss the development and implementation of a communication plan in a future call with a subset of the Whatcom Clean Water Project public education and outreach workgroup.
 - Anne will set up a conference call the **week of Sept 12** to review draft materials created to date and finalize a communication plan.
 - Fran will add outreach and education to the CRADA to allow additional partner participation by Whatcom CD.

Water Policy Diagram

- loosely structured

Water Policy Board

County, Bellingham, PUD, Tribes, State

In Stream Interests

Tribes, State (DOE, WDFW)

Out of Stream Users

Water Supply Work Group
(Cities, County, AWB, PUD, Water Districts, Water Assoc.)

Groups where water policy is discussed, in some cases implemented

PIC Program

Quality focused

Whatcom LIO

Puget Sound Partnership

Lummi Settlement Negotiations

AG Water Board

All WIDs

Planning Unit

Uncertain status

Whatcom Water Supply Coalition Strategic 2-Year Work Plan

Introduction/Background

The Whatcom Water Supply Coalition (WWSC) is a staff-level work group of entities responsible for supplying water. The work group originally formed in 2009 and was put on hold given other efforts that were underway related to water supply planning including discussions around an update to the Whatcom County Coordinated Water System Plan.

The work group was reconvened in December 2015 because there was interest expressed in re-establishing staff level discussions around water supply challenges, and to investigate opportunities for solutions.

Representatives on the WWSC include staff from the Ag Water Board, Birch Bay Water and Sewer District, Cities of Bellingham, Blaine, Ferndale, and Lynden, Whatcom County, Water System Services, and PUD No. 1. Water System Services is a Whatcom County Satellite Management Agency.

This initial Strategic Plan outlines the WWSC goals and strategies for a long-term strategic plan but focuses on the highest priority goals that are achievable in a one or two year timeframe. The longer term goals and strategies will guide future iterations of the WWSC Strategic Plan and/or work plan; this is a living document that will change as necessary but is also a guiding document that defines very near-term needs.

Purpose

Staff-level forum to share, identify, investigate, and pursue solutions that support resolution of water supply issues.

Organization/Administration

The WWSC will identify, investigate, and pursue solutions included in the WWSC Work Plan and related Strategic Plan, and support leveraging of resources to implement the plan. Initially, the PUD No. 1 will coordinate and facilitate the WWSC. As a work group, the WWSC does not have any regulatory or other decision-making authorities; participants are staff that work within the authorities and policies of their individual entities.

Whatcom Water Supply Coalition Strategic Goals (SG)

SG.1. Understand and identify out of stream water quantity deficiencies.

SG.2. Provide water supply information for connecting water availability to land use in the Whatcom Comprehensive Land Use Plan and other long-term plans.

SG.3. Develop, evaluate, consider, and support projects or processes that serve two purposes: provide incremental solutions to demonstrate progress, and address long-term water supply security.

SG.4. Provide water use information to the public, advisory groups, elected officials/decision-makers, tribes, and other relevant groups.

SG.5. Understand water quality deficiencies in the context of informing water supply solutions.

SG.6. Identify where legislative action is necessary to implement water supply solutions and develop strategies to achieve those actions.

38 Summary Table: Whatcom Water Supply Coalition Strategies, Objectives, and Priorities

<i>Goal</i>	<i>Strategies</i>	<i>Objectives</i>	<i>2016-2017</i>	<i>2018-2019</i>
SG.1.	1.1 Facilitate further quantification of out of stream water use and water availability.	1.1a. Evaluate existing data and identify data gaps for purposes of meeting current and future out of stream needs.	x	
		1.1b. Evaluate status of water right certificates, applications, and future reallocation of existing water rights by Subbasin to meet out of stream needs	x	
	1.2 Facilitate completion and operation of the WRIA 1 ground water model.	1.2a. Propose funding strategy for completing Phase 4 of the groundwater model	x	
		1.2b. Complete Phase 4 of the groundwater model	x	
		1.2c. Incorporate long-term climate change data into water budget, surface water model, and groundwater model.	x	
	1.3 Facilitate data development and close data gaps	1.3a Evaluate where there are gaining reaches in priority or focus areas (supports groundwater model and augmentation sites)		x
		1.3b Evaluate technical tools to determine if 'robust enough' for decision-making		x
	1.4 Support efforts to identify instream flow requirements in the context of informing water available for out of stream uses.			x
SG.2.	2.1 Evaluate water quantity needs associated with land use section of the Whatcom County Comprehensive Plan and identify and categorize areas within Whatcom County as water quantity deficient (e.g., what areas are most in need of addressing water quantity, where are the areas of sufficient supply that may support solutions).	2.1a Review geographic relationships between Whatcom County Coordinated Water System Plan and latest update to the Whatcom County Comprehensive Plan to identify focus areas for short and long term out of stream water solutions	x	
		2.1b Evaluate water quantity needs associated with projected land use in context with changing climate and glacier melt, identify if there are data or information gaps, and facilitate data collection and/or actions based on the evaluation		x
	2.2 Utilize available models to develop scenarios for modeling water availability under different conditions and demand.			x

ATTACHMENT A

<i>Goal</i>	<i>Strategies</i>	<i>Objectives</i>	<i>2016-2017</i>	<i>2018-2019</i>
	2.3 Support an infrastructure analysis to help inform long term water supply solutions.		x	
	2.4 Evaluate opportunities for integrating water supply solutions into floodplain management planning (e.g., storage during flood events).		x	
SG.3.	3.1 Develop a Whatcom County Water Users Drought Plan that addresses both long term solutions and short-term solutions for seasonal droughts	3.1a. Identify short term solutions for addressing agricultural water supplies during seasonal droughts	x	
		3.1b. Identify a wet water pilot project that may address a short term water supply need.	x	
		3.1c. Identify and implement a pilot augmentation project that will put water back into the stream at critical times.	x	
	3.2 Develop a regional supply plan that provides for short and long term water supply needs (not associated with drought or emergency conditions).	3.2a. Explore developing and piloting a water exchange for reallocating existing water to address agricultural needs.	x	
		3.2b. Explore multiple opportunities for short and long term supply including off-stream reservoirs, deep aquifer storage, pipelines, conservation, reuse, and conversion of use.	x	
		3.2c. Evaluate interties to address inadequate water rights and future water supply needs.	x	
	3.3 Serve as the 'library' for the WRIA 1 Ground Water Model and maintain a completed model.			x
	3.4 Serve as coordinating body for discussion, evaluation, and advancing of water supply solutions			x
	3.5 Evaluate and incorporate cost of water, infrastructure maintenance, and innovation in context of water supply solutions.			x
SG.4.	4.1 Use existing avenues for providing outreach on WWSC information.	4.1a. Establish partnerships with WWIN, WSU, WCD, Committees, and other entities for purposes of sharing WWSC information.	x	
SG.5.	5.1 Support water quality monitoring and analysis.	5.1a. Participate with WRIA 1 entities in updating/supporting a central database including ZAPS units.	x	

ATTACHMENT A

Goal	Strategies	Objectives	2016-2017	2018-2019
SG.6.	6.1 Identify and support a funding strategy that facilitates solutions to short and long term water supply and in doing so also supports improvements to water quality and habitat			x
	6.2 Evaluate the regulatory environment in terms of advancing water supply solutions that balance environmental needs.	6.2a. Investigate previous efforts undertaken to advance out of stream water solutions, and based on lessons learned, develop alternative strategies.		x
		6.2b. Facilitate an adaptive management process that enables progress on water supply solutions using common “best available data” as other resource plans or planning efforts.		x

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Consultant Scope of Services for the Development of a Numerical Groundwater Model for the Lynden/Everson/Nooksack/Sumas (LENS) Area of Whatcom County

Revised August 17, 2016

Phase 1 – Project Definition and Scoping

Task 1.1 – Develop Draft Scope of Services: Develop a short technical memorandum that presents a draft project scope, recommendations regarding the groundwater model domain, an outline of potential model objectives/goals, and an overall project budget.

Task 1.2 – Meet with County Representatives: Meet with representatives of the administrative agent of the Joint Board (Whatcom County) to discuss the information presented in the draft Scope of Services.

Task 1.3 – Final Project Scope and Budget: Refine the draft project scope, including model domain and objectives/goals, and budget based on input from the County.

Phase 1 Deliverables:

- GIS project base map of overall conceptual/numerical model domain.
- Phase 2 and 3 final scope of services and budget.

Phase 1 Budget: \$7,850. It should be noted that the Phase I services were completed on budget under Whatcom County Contract No. 201409009.

Phase 2 – Data Collection and Conceptual Model Development

Task 2.1 – Collect and Review Data: The majority of the available geologic and hydrogeologic information available for WRIA 1 was compiled, analyzed and organized into a searchable GIS database by members of the Consultant Team during the completion of the WRIA 1 Groundwater Data Assessment project in 2013. Task 2.1 will consist of updating and refining the data compilation. The services completed under this task will include:

- Complete a detailed review of the data contained in the existing GIS database to identify information pertinent to the development of the conceptual/numerical model.
- Contact appropriate agencies/entities to uncover any new geologic/hydrogeologic information and water use data that are now available for WRIA 1 and similar information available for that part of the model domain located in Canada.
- Review the newly discovered information for technical content pertinent to the development of a groundwater flow model and incorporate the appropriate documents into the existing geologic/hydrogeologic database.
- Compile spatially variable data into a GIS dataset that can be used as input into the conceptual and numerical models.

Task 2.1 Deliverables:

- Updated geologic/hydrogeologic database.
- Datasets of pertinent geologic/hydrogeologic data.

Task 2.1 Budget: \$28,090.

Task 2.2 – Define Geologic and Hydrostratigraphic Units: The existing information identified and analyzed during the completion of Task 2.1 will be used to determine the spatial extent (horizontal and vertical) of the primary geologic units located in the model domain. Where possible, the geologic units will be grouped under a single new unit designation based on similarities in lithology and stratigraphic position to allow a simplified and consistent representation of the geology throughout the US/Canada model domain. The new geologic units will be further grouped into a number of hydrostratigraphic units, consisting of aquifers and confining units, on the bases of lithologic and hydrologic characteristics. The hydrostratigraphic units will form the bases for the conceptual and numerical models.

Task 2.2 Deliverables:

- USA/Canada stratigraphic correlation column of pertinent geologic units.
- Detailed descriptions of each hydrostratigraphic unit.

Task 2.2 Budget: \$13,610.

Task 2.3 – Develop Conceptual Groundwater Model: The available geologic, hydrogeologic, hydrologic and water use information will be used to develop a conceptual model for the entire model domain that will be used as the framework for the numerical groundwater model. The conceptual model will be used to define the hydrostratigraphy, and analyze available well and other hydrogeology data for the parameterization of the numerical groundwater model. The model will incorporate the available data regarding key aquifer/aquitard characteristics, surface/groundwater hydraulic continuity, groundwater recharge, drainage tiles and drainage ditches, and groundwater consumptive use. The conceptual model will be used to analytically evaluate potential groundwater discharge to specific stream reaches that can be cross-checked against similar output from the existing Topnet-WM surface water model for the area. It is anticipated that the development of the conceptual model will occur concurrently with the completion of the other Phase 2 tasks.

Task 2.3 Deliverables:

- Model domain map showing pertinent physiologic features and existing monitoring well locations.
- Surficial geologic map of model domain.
- Up to eight detailed geologic/hydrogeologic cross sections of the model domain.
- Structural contour maps of the top of each hydrostratigraphic unit.
- Spatial variability maps of the hydrogeologic characteristics of each hydrostratigraphic unit.
- Datasets of water level monitoring data.
- Contour maps of inferred average annual groundwater elevations for each identified aquifer unit within the model domain. In areas of the model domain where groundwater elevation data is adequate, we will also develop contour maps of seasonal (early spring and early fall) groundwater elevations.

Task 2.3 Budget: \$44,610.

Task 2.4 – Identify Data Needs: The detailed conceptual model will allow the Consultant Team to further evaluate the existing information regarding the quality and spatial/temporal distribution of the data with respect to the development of the numerical groundwater model. Critical data gaps will be identified during the completion of this task and, if possible, addressed during the completion of Task 2.6.

Task 2.4 Deliverables:

- List of potential critical data gaps and a summary statement about the relative importance of addressing each of the identified data gaps.
- Technical memorandum outlining plan to address data gaps.

Task 2.4 Budget: \$6,620.

Task 2.5 – Groundwater/Surface Water Monitoring and Data Collection: A great deal of critical information appears to be available for portions of the model domain. However, additional data must be collected from land owner wells and streams to successfully develop a model sufficiently representative of the groundwater system to support future decision-making. We anticipate that our scope of services for this task will include the following:

- Work with interested stakeholder groups located specifically within the Bertrand Creek portion of the model domain to identify well owners who will allow the installation of long-term monitoring equipment, synoptic water level measurements, and/or possible aquifer testing activities.
- Develop, establish and operate surface and groundwater data collection networks in the model domain.
- Add instrumentation consisting of continuous water-level data recorders in up to 20 wells located at various distances from Bertrand Creek. Download the data from each data recorder roughly every three months for approximately one year. The downloaded water level data will be compiled into a database.
- Complete short-term (6 to 10 hours) aquifer pumping tests in up to 15 of the identified wells using the pumps installed in the wells. Measure water level drawdown and recovery in the pumping wells and any appropriate nearby wells prior to, during and following the aquifer tests.
- Analyze the aquifer testing data to estimate pertinent aquifer parameters (transmissivity, hydraulic conductivity, and storage coefficients). Compile the aquifer testing data into a comprehensive database.
- Establish up to two temporary stream gaging stations equipped with continuous stage recorders within the Bertrand Creek drainage. Monitor stream flow at the gaging stations for no less than one continuous year. Develop stage-discharge relationships for each station based on 10 to 12 discharge measurements collected over a range of flow conditions. The data collected from the stream gaging stations will be used as input into the revised surface water model and, consequently, to inform the conceptual and numerical models.
- Complete seepage runs, streambed conductivity and/or synoptic streamflow measurements in selected streams located in the Bertrand Creek portion of the model domain. For budgeting purposes, it is assumed that the activities described in this subtask will require no more than 40 hours of field time.
- Analyze the groundwater level time-series data and develop groundwater level hydrographs for each monitored well.

Task 2.5 Deliverables:

- Detailed datasets of collected/analyzed data.

Task 2.5 Budget: \$50,130.

Task 2.6 – Draft Conceptual Model Technical Report: Prepare a detailed technical report that describes the data collection and analyses completed for Phase 2 and 3 of the project and the conceptual model of the selected domain. The report and associated datasets will be designed in a manner that allows them to be used as the foundation for the numerical groundwater model. The draft technical report will be first issued as a preliminary draft for review by Groundwater Project Team.

Task 2.6 Deliverables:

- Preliminary draft and final draft detailed report describing the conceptual model.

Task 2.6 Budget: \$37,775.

Task 2.7 – Project Meetings and Team Interactions: During the completion of Phase 2 the Consultant Team Lead will communicate weekly with the Groundwater Project Team Lead via phone and/or email regarding project status and progress. In addition, the Consultant Team will participate in the following meetings during the completion of the Phase 2 activities.

Project Initiation and Data Needs Meeting: We will meet with the Groundwater Project Team within roughly one month of project authorization to brief the Team on project status and to discuss preliminary understanding of potential project data needs.

Initial WRIA 1 Planning Unit Meeting: We will prepare briefing sheets and presentation slides for the Groundwater Project Team Lead to present the general scope of work to the Planning Unit approximately one month after project authorization. The Consultant Team will participate in the project briefing meeting to support the Groundwater Project Team Lead in answering questions as needed.

Draft Conceptual Model Meeting: We will meet with the Groundwater Project Team approximately 2-weeks after submitting the Draft Conceptual Model report. The purpose of the meeting will be to present and describe the conceptual modelling results and gather technical and usability input.

Planning Unit Conceptual Model Meeting: We will prepare briefing sheets and presentation slides for the Consultant Team Lead to present the conceptual model domain and technical approach to the Planning Unit within one month after the completion of the draft conceptual model report. The purpose of the meeting will be to brief the Planning Unit on development of the conceptual model and respond to questions/comments.

Task 2.7 Deliverables:

- Project briefing sheets and presentation slides for each meeting.

Task 2.7 Budget: \$6,735.

Task 2.8 – Technical Review and Information Management: Technical, usability, and accessibility reviews will be conducted throughout development of work products described in Phase 2 and coordinated by the Consultant Team Lead. Draft and final work products will be circulated for review and comment by the Groundwater Project Team.

Comments and questions generated during technical review outlined below will be used to develop a frequently asked questions briefing sheet about the project in general. Final technical reports will provide the foundation for development of public presentation materials that communicate the technical information to decision makers and the public.

Review instructions will be distributed via email and during the Groundwater Project Team meetings and other County briefings to support a broad-based review of the inputs, methods, and technical reports prepared. Input will be collected using electronic comment submission, face-to-face conversations, and group presentations, as described briefly below. Key junctures for work product review are highlighted below.

- The Groundwater Project Team Lead will use briefing materials and technical review/comment instructions prepared by the Consultant Team to inform and to gather input from assigned members of the Groundwater Project Team. These input will be used as foundation for development of further technical work products.
- Outreach to the Bertrand WID and its administrative staff (Henry Bierlink) will be conducted to present data needs for the project, identify potential sites for additional data collection, and request landowner participation in technical tasks. The Consultant Team will provide briefing sheets and assistance to the Bertrand WID for use when conducting landowner outreach and project participation plan.
- Draft conceptual model report outreach for technical review and local knowledge input will be conducted by the Groundwater Project Team Lead using briefing materials, website and comment compilation tools provided by the Consultant Team. This outreach task will engage representatives of the Groundwater Project Team and assigned technical and local knowledge reviewers identified by the Team. Review instructions will be distributed by email, presented in face-to-face forums and/or brief open house added to an existing meeting of the Groundwater Project Team. Technical reviewer instructions and materials will be posted on the website by the Groundwater Project Team Lead as needed over the course of this project.

All public access materials will be prepared in print and web-ready formats for posting on the existing Whatcom County WRIA 1 public access website for use by technical and local knowledge reviewers.

Task 2.8 Deliverables:

- PowerPoint presentation on project purpose, scope, approach, conceptual model and report, usability objectives and data considerations.
- Review instructions for technical experts and local knowledge usability reviewers involved in review of the draft and final conceptual model report.

- Presentation of project briefings and compilation of questions and comments provided during face-to-face meetings.
- Outreach materials to support Consultant Team and Bertrand WID.

Task 2.8 Budget: \$4,580.

Phase 2 Total Budget: \$192,150. It should be noted that the Phase 2 services are currently being completed under Whatcom County Contract No. 201412022.

Phase 3 – Conceptual Model Analyses and Documentation

Task 3.1 – Develop and Refine Water Use Data: The Bertrand Creek drainage within the Lower Nooksack Subbasin will be delineated into 25 smaller sub-watersheds based on boundaries defined in previously developed Topnet-WM versions (discussed further in Task 3.2) for better estimating recharge inputs to the groundwater model. It is understood that the Phase 3 services described in this scoping document will be completed jointly with the University of Washington, which has a separate contract with Whatcom County.

Irrigated areas, population on exempt wells, commercial uses, and public water systems service areas will be analyzed and summarized for each sub-drainage, and formatted as input to the Topnet-WM model(s).

The services completed under this task will include:

- Analyze, summarize, and format irrigated areas using the 2014 Crop Survey recently completed by the Washington State Department of Agriculture. The Bertrand Creek drainage will be further delineated from one drainage (USU model/Water Budget 2012) into 25 sub-drainages to develop water management parameters with the 2007/08 Topnet network for the creek.
- Refinement of population data used in the 2012 Lower Nooksack Water Budget to match the delineated sub-drainages will be completed to estimate exempt well use for areas outside of public water system service areas. Municipal and public water system data will be apportioned according to the sub-drainages and the service area boundaries.
- Data will be summarized for each of the sub-drainages and formatted for input into Topnet-WM. Estimates of irrigation water use will be calculated within Topnet.

Task 3.1 Deliverables:

- Summaries of Bertrand Creek datasets developed.
- Input files for Topnet-WM model of Bertrand Creek sub-drainages.

Task 3.1 Budget: \$27,056.

Task 3.2 – Update Surface Water Model: Subsurface recharge is a surface water model output that can be used as an independent constraint on the groundwater recharge that is specified for the groundwater model. This is an important aspect of the analysis, as it will help to ensure that the surface water and groundwater models are internally consistent. The surface water modeling will help to identify a long-term period of representative climatic conditions and resulting groundwater recharge, which can serve as input over a representative time period and for the calibration of a steady-state groundwater model. The surface water modeling will also provide important insights about stream baseflows for calibrating the groundwater model.

The analysis of surface water and groundwater conditions will be conducted within the Bertrand Creek drainage area where it should be capable of addressing specific questions of drainage impacts and groundwater withdrawal impacts from wells on surface water. The groundwater

model overall capability and resolution will, to a certain degree, be dependent on the resolution and reliability of the groundwater recharge estimates generated by the surface water model.

The current model domain of the surface water flow model, Topnet-WM, includes the entire WRIA 1 watershed, but calibration and water use inputs have only been refined for the Lower Nooksack Subbasin portion of the basin at a basin average scale. This work will refine water use inputs specifically to the Bertrand Creek sub-drainages. The following is a summary of the various methods that will be utilized to estimate groundwater recharge in the conceptual/numerical groundwater model:

- As a first step, a relatively coarse distribution of recharge will be developed for the entire conceptual/numerical model domain.
- For the Lower Nooksack Subbasin, watershed-scale average groundwater recharge values developed by the 2012 Topnet-WM surface water model will be specified as initial inputs to the groundwater model.
- The greater resolution groundwater recharge estimates for the previously discussed delineated Bertrand Creek sub-drainages (25) developed from the Topnet-WM model will be used as input to the groundwater model.

The services completed under this task will include:

- Add the Topnet-WM water management component and parameters to the existing Bertrand Creek sub-drainages.
- Surface water model calibration. Model parameters will be adjusted for the best “goodness of fit” (as measured quantitatively with streamflow statistics such as the Nash Sutcliffe coefficient, bias and exceedance probabilities) to observed streamflow, groundwater levels, and climate time series for the Bertrand Creek sub-drainages.
- Analysis of existing data to generate initial recharge estimates for the entire domain groundwater model.
- Analysis of existing data to develop watershed-scale average groundwater recharge estimates for input to the Lower Nooksack Subbasin groundwater model domain.

Task 3.2 Deliverables:

- Detailed high resolution surface water model including water use of the Bertrand Creek sub-drainages.
- High resolution groundwater recharge estimates for Bertrand Creek sub-drainages.
- Lower resolution groundwater recharge estimates for the remaining portions of the groundwater model domain.

Task 3.2 Budget: \$1,779.

Task 3.3 – Water Use and Surface Water Modeling Report: Prepare a short technical memorandum that describes the data collection and analyses completed for Tasks 3.1 and 3.2. The technical memorandum and associated datasets will be included as an appendix to the draft conceptual model report.

Task 3.3 Deliverables:

- Draft technical memorandum describing the water use and surface water modeling activities.

Task 3.3 Budget: \$6,261.

Task 3.4 – Revise Draft Conceptual Model and Report: The draft conceptual model and associated report completed in Phase 2 will be revised to incorporate the additional information regarding groundwater recharge developed during the completion of Phase 3 Tasks 3.1 and 3.2.

Task 3.4 Deliverables:

- Updated draft conceptual model report.

Task 3.4 Budget: \$7,500

Phase 3 Total Budget: \$42,596. It should be noted that the Phase 3 services are currently being completed under Amendment No. 1 to Whatcom County Contract No. 201601005. It should also be noted that the University of Washington is contracted directly to the County to provide technical services in Phase 3. We understand that the University of Washington's budget for their portion of Phase 3 is \$40,904.

Phase 4 – Numerical Model Development

The Consultant Team will undertake a careful review to ensure that the numerical modeling platform adopted for the project will meet the project objectives and support water resources management well beyond the timeline of this project. The preference of the team is to use MODFLOW USG, the unstructured grid version of the widely used MODFLOW that has been developed recently. MODFLOW USG offers all of the advantages of MODFLOW, including having an open source code, being accepted widely and supported by accessible graphical user interfaces. In addition, MODFLOW-USG supports flexible spatial discretization with local resolution. The groundwater model developed for the WRIA 1 modeling domain will be refined in the focus area to support the accurate location of groundwater takings (i.e., drainage tile and ditch locations and groundwater well locations) and surface water features. The model will also be refined to represent hydraulic gradients near wells and streams, to represent variations in material properties and stratigraphic complexity.

The groundwater modeling will follow a phased approach in which complexity will be built up gradually. The modeling will begin with a regional-scale calibration of long-term average conditions. A steady-state groundwater model will be developed for this phase of the analyses. Attention will then be directed towards the focus areas of the study, in particular the Bertrand Creek drainage. The performance of the steady-state model will be examined in detail in this area, and the model will be extended to simulate transient conditions. Selected data sets will be assembled and simulated to demonstrate that the groundwater model is capable of simulating changes in conditions at the local scale. The modeling practices that will be adopted will be consistent with guidelines of the American Society for Testing and Materials (ASTM D6025 and D5718) and the United States Geological Survey.

Task 4.1 – Surface Water/Groundwater Model Coupling: The groundwater model will be calibrated for long-term average (steady-state) conditions. The Consultant Team will adopt a “loosely coupled” approach for model development. In this approach, the groundwater recharge distribution representative of average conditions will be developed from the results of the Topnet-WM model. The recharge rates will then be assigned as starting values for the groundwater flow model. As a starting point, average annual recharge will be compiled from the results of the Topnet model. The results of the flow model will then be reviewed to assess whether the recharge distribution is consistent with interpreted water table elevations. The properties of the surficial sediments specified in the surface water and groundwater models will be adjusted successively and systematically until a consistent recharge distribution is achieved between the two models. After an acceptable match to long-term average conditions is achieved, the groundwater model will be adapted to simulate monthly-average conditions. The completion of this task will include:

- Updated Topnet-WM code to allow for subsurface storage monthly updates of regional groundwater levels derived from the groundwater model.
- Link refined models (see above) and upper fork model time series (based on collaboration with Nooksack Indian Tribe DHSVM glacier modeling) as boundary conditions to the WRIA 1 Topnet-WM model and perform model analysis of the Nooksack River at Ferndale.

- Determine required spatial resolution of drainage-based recharge surface water model estimates for use in the groundwater model for estimating impacts of drainage activities and groundwater pumping (compare regional domain, Lower Nooksack Subbasin domain, and Bertrand domain scales).

Task 4.1 Deliverables:

- Updated Topnet-WM code.

Task 4.1 Budget: \$33,418.

Task 4.2 – Calibration of the Groundwater Model: The groundwater model will be calibrated under both steady-state and transient conditions to match both “hard” and “soft” targets. The steady-state model calibration hard targets will include average groundwater levels estimated from dedicated observation wells and production wells, and estimates of groundwater discharge to surface water features inferred from changes in baseflows between gaging stations. For the initial steady-state analysis, the targets will be developed as representative long-term average water levels and baseflow estimates. The transient groundwater model hard targets will include seasonal groundwater level changes where that data is available and time-series water level drawdown associated with short- and long-term aquifer pumping tests. The soft targets will include regional interpretations of groundwater flow patterns and any one-time (spot) measurements of water levels in private wells and stream flows. During the calibration, the hydraulic conductivities assigned for different hydrostratigraphic units and areas of the model will be adjusted systematically and within realistic bounds to match the calibration targets. The calibration will focus on selected areas of the model.

- During calibration, local water budgets will be developed and checked to ensure that the magnitudes of the components of the water budget are physically realistic.
- The goodness-of-fit of the model to the observations will be assessed through multiple statistical measures of the residuals, which represent the difference between the observed and simulated groundwater levels at target locations. The statistics will include the mean residual, mean absolute residual, standard deviations of the residuals and the normalized standard deviations. The goodness-of-fit measures will be compared with model acceptance criteria. Maps will also be prepared to indicate the magnitudes of the differences between the target and simulated groundwater levels. These maps will serve to demonstrate that there are no areas of the model where the simulation results are systematically biased and to identify areas where data coverage is limited.
- The simulated groundwater discharges to streams will be checked against the differences in interpreted baseflows between gauging stations. The assessment of goodness-of-fit will include an evaluation of the approximations inherent in the estimation of baseflow.
- Final water budget for the focus areas of the model will be developed.
- After the steady-state groundwater model has been calibrated, it will be adapted to simulate transient groundwater flow conditions. Where data are sufficient, the model will

be applied to simulate the observed changes in groundwater levels that have been caused by controlled changes in pumping.

- Maps will be prepared to illustrate the material properties that have been inferred through model calibration. The material properties will be assessed with respect to their consistency with estimates derived from hydraulic testing that are compiled in the conceptual model.
- A formal report will be prepared documenting the calibration process and model “goodness of fit”, the contents of the calibrated groundwater model and the results obtained with it. The report will include maps that will facilitate application of the scientific results by local water resource managers.

Task 4.2 Deliverables:

- Maps displaying the magnitudes of the differences between the target and simulated groundwater levels.
- Maps illustrating the material properties that have been inferred through model calibration.
- Draft and final report describing the numerical groundwater flow model.

Task 4.2 Budget: \$229,212.

Task 4.3 – Revise Conceptual Model and Final Technical Report: Revise the conceptual model as appropriate based on feedback from the numerical groundwater model regarding model parameters. Prepare a final technical report that describes the data collection and analyses completed for the project and the final conceptual model of the selected domain. The report will address/incorporate comments prepared by the Groundwater Project Team during the completion of Phase 3 Task 3.2 and information developed during the construction of the numerical groundwater model. The final technical report will be first issued as a draft for review by Groundwater Project Team.

Task 4.3 Deliverables:

- Final detailed report describing the conceptual model.

Task 4.3 Budget: \$28,237.

Task 4.4 – Project Meetings and Team Interactions: During the completion of Phase 4 the Consultant Team Lead will communicate weekly with Groundwater Project Team Lead via phone and/or email regarding project status and progress. In addition, the Consultant Team will participate in the following meetings during the completion of the Phase 4.

Preliminary Numerical Model Meeting: We will meet with the Groundwater Project Team after steady-state calibration is completed. The purpose of the meeting will be to discuss the numerical modelling design.

Planning Unit Numerical Model Meeting: We will prepare briefing sheets and presentation slides for the Groundwater Project Team Lead to present to the Planning

Unit within one month after the completion of the final conceptual and numerical model reports. The Consultant Team will participate in the project briefings to support the County's project lead in answering questions as needed. The purpose of the meeting will be to brief the Planning Unit on development of the conceptual and numerical models, their functions and constraints, and respond to questions/comments.

Task 4.4 Deliverables:

- PowerPoint presentation on project purpose, scope, approach, numerical model report, usability objectives and data considerations.
- Plain language overview of the Groundwater Model Project, highlighting improvements made to WRIA 1 resources/tools including new data and recalibration quantitative improvements.
- Review instructions for technical experts and local knowledge usability reviewers involved in development of the numerical model report.
- Presentation of project briefings and compilation of questions and comments provided during face-to-face meetings.

Task 4.4 Budget: \$17,147.

Task 4.5 – Technical Review and Information Management: Technical, usability, and accessibility reviews will be conducted throughout development of Phase 4 work products and coordinated by the Consultant Team Lead. Draft and final work products developed within this project scope will be circulated for review and comment by the Groundwater Project Team.

Comments and questions generated during technical review outlined below will be used to develop a frequently asked questions briefing sheet about the project in general. Final technical reports will provide the foundation for development of public presentation materials that communicate the technical information to decision makers and the public.

Review instructions will be distributed via email and during the Groundwater Project Team meetings and other County briefings to support a broad-based review of the inputs, methods, and technical reports prepared. Input will be collected using electronic comment submission, face-to-face conversations, and group presentations, as described briefly below. Key junctures for work product review are highlighted below.

- Draft numerical model report outreach for technical review and local knowledge input will be conducted by the Groundwater Project Team Lead using briefing materials, website and comment compilation tools provided by the Consultant Team. This outreach task will engage representatives of the Groundwater Project Team and assigned technical and local knowledge reviewers identified by the Team. Review instructions will be distributed by email, presented in face-to-face forums and/or brief open house added to an existing meeting of the Groundwater Project Team. Technical reviewer instructions and materials will be posted on the website by the Groundwater Project Team Lead as needed over the course of this project.

Comment compilation and response documents for each technical report and appendix will include review briefings and instruction documents, summary of methods used (e.g., forum agendas, website copy); and a list of technical and local knowledge reviewers. All public access materials will be prepared in print and web-ready formats for posting on the existing Whatcom County WRIA 1 public access website for use by technical and local knowledge reviewers.

Task 4.5 Deliverables:

- PowerPoint presentation on project purpose, scope, approach, numerical model report, usability objectives and data considerations.
- Review instructions for technical experts and local knowledge usability reviewers involved in review of the draft and final numerical model report.
- Presentation of project briefings and compilation of questions and comments provided during face-to-face meetings.
- Outreach materials to support Consultant Team.

Task 4.5 Budget: \$11,662.

Phase 4 Total Budget: \$318,676.

Total Project Budget: \$562,272.

Total Project Budget Including that portion of Phase 3 which is contracted to the University of Washington: \$603,176.

AWB Board

Scott Bedlington, Bertrand WID
Roger Bajema, North Lynden WID
Rod Vande Hoef, South Lynden WID
Mike Boxx, Laurel WID
Marty Maberry, Drayton WID
Andy Enfield, Sumas WID

August 11, 2016

Dear Governor Jay Inslee:

Farmers in north Whatcom County would like you to examine an issue that has become a growing concern for us. We farm land that is drained and irrigated by several streams along the US-Canadian border. One of our great challenges is to ensure these streams remain healthy habitat for our native salmon runs. Towards that end we have been actively engaged in habitat restoration, reducing stream withdrawals, and augmenting stream flows at critical low flow periods.

The agricultural community has been working with the Lummi Nation and the Nooksack Tribe to reach win-win solutions on these streams while preserving the vital agricultural economy of Whatcom County. Our efforts are severely compromised by what goes on just north of the border. In the past weeks we have seen several of our trans-boundary streams dried up due to dams in British Columbia. It is disheartening to see fish dying in heated pools when the water that sustains them is no longer flowing south across the border. It also makes all our efforts to increase stream flows feel inconsequential.

The specific streams being affected are Jackman Ditch (Perry Homestead Brook in Canada) and Pepin Creek. Jackman is a tributary to Bertrand Creek and Pepin a tributary to Fishtrap Creek. Both are salmon streams.

We request you to bring this issue to the attention of the British Columbia government, the BC \WA Environmental Cooperation Council, and the International Joint Commission which addresses trans-boundary concerns. This is not a new problem but it seems to be increasing each year. We have in-stream flow goals on these streams that we are striving to achieve. Shouldn't our neighbors be partners in this endeavor?

A response to our concerns will be greatly appreciated.

Sincerely,



Scott Bedlington
AWB Chairman

cc: Senator Patty Murray
Senator Maria Cantwell
Representative Suzan Del Bene
Representative Rick Larsen
Maia Bellon, Director, Department of Ecology
Derek Sandison, Director, Department of Agriculture
Merle Jefferson, Lummi Nation Natural Resources Director
George Boggs, Whatcom Conservation District



Proposed Education and Outreach Calendar 2016/2017

Date	Event	Coordinators	Location	Speakers/Staff
9/10/2016	Sustainable Connections Farm Tour	SC	Whatcom County	Katie/Corina
9/24/2016	4 th Annual Run with the Chums	WCD	Birch Bay	Corina
10/1/2016	SeaFeast	WWIN	Bellingham	Corina
10/4/2016	Elementary School Field Trip	WFF and WSU Ext	Lynden	Corina
10/20/2016	Speaker Series: Winterize your farm <ul style="list-style-type: none"> ▪ Cover Crop ▪ Gutters ▪ Manure Storage ▪ Fencing ▪ HUA footing/protection ▪ Meet the Bertrand WID 	WCD/Bertrand WID	Bertrand/Berthusen	WCD Staff
11/17/2016	Speaker Series: <ul style="list-style-type: none"> ▪ Animal Health & Herd Management ▪ Herd Health ▪ Hoof Health ▪ Group Housing ▪ Meet the South Lynden WID 	WCD/SLWID	10 Mile Grange	Amber Itle/Susan Kerr?/ Amber Adams-Progar (?)
11/30-12/2	Small Fruit Conference <ul style="list-style-type: none"> ▪ Berry Nutrient Management 	Berry Com/WSU	Lynden	WCD Staff
12/15/2016	Speaker Series: Water Quality and Drainage <ul style="list-style-type: none"> ▪ Current status of Water Quality ▪ Online data resources/Water quality E-newsletters ▪ Hedgerows and CREP (?) <i>*not for water quality</i> ▪ Meet the North Lynden WID/City of Lynden 	WCD/NLWID/COL	Lynden/City Park	Erika Douglas/Aneka/Frank

All highlighted items are
proposed and up for review

Date	Event	Coordinators	Location	Speakers/Staff
1/?/2017	Manure Nutrient Management Training	WCD	Lynden/Fairgrounds	Nichole/WSDA/WSU/?
1/19/2017	Speaker Series: Horses for Clean Water (HCW)	WCD/Laurel WID	Laurel/Bellewood	Alaine Blickle (HCW)
	<ul style="list-style-type: none"> Manure Storage Pasture Health HUA or Confinement Care Winter Exercise areas Meet the Laurel WID/10 Mile Clean Water 			
1/26/2017	Speaker Series: Berry	WCD	Lynden/Fairgrounds	WCD Intern
	<ul style="list-style-type: none"> Berry land management practices Presentation of new berry outreach materials Tools 			
2/16/2017	Speaker Series: Pasture Management	WCD/Drayton WID	Haynie Grange	Steve Fransen (WSU)
	<ul style="list-style-type: none"> Forage quality/Weeds Pasture rotation Fencing options Meet the Drayton WID 			
3/11/2017	Small Farm EXPO	WCD/WCPW	Lynden/Fairgrounds	WCD plus many more
3/18/2017	Wings over Water	Birch Bay Chamber	Birch Bay/Blaine	Aneka /Brandi/ Emily
3/25/2017	24 th Annual Native Plant Sale	WCD	WCC	WCD Staff
3/16/2017	Speaker Series: Cover Crops	WCD/Sumas WID	Hopewell/Everson	WCD and Chris Benedict (WSU)
	<ul style="list-style-type: none"> Cover Crops in dairy, berry, potato, and other crops Agronomy Meet the Sumas WID 			



Organization of the Whatcom Conservation District

The District is a political subdivision of the State of Washington. Its authorities, powers and structure are set forth in Chapter 89.08 RCW et seq. These include developing and implementing programs to protect and conserve soil, water, air, prime and unique Farmland, rangeland, woodland, wildlife, energy, and other renewable resources on nonfederal lands. Districts also help stabilize local economies and mediate conflicts in land use. Its boundaries include all of Whatcom County. It is governed by a volunteer board of five supervisors who are all local residents. Three are elected by the residents of Whatcom County. Two are appointed by the Washington State Conservation Commission. The Board of Supervisors is assisted by a staff of professionals with diverse skills, training and experience necessary to accomplish the District's goals.

The realities within which we function:

Globally: Earth is our only livable planet. It is home. Earth's ability to support life as we know it is dependent on individual and collective efforts to conserve the natural resources of land, water and air. We are temporary occupants and passing stewards and custodians of these natural resources. Failure to take care of our home's natural resources – for ourselves and for those who will follow – is not an option. However, we must have food, fiber and energy to exist.

Internationally: We share the Salish Sea, Fraser River Valley and Georgia Basin/Puget Sound International Airshed with our British Columbia, Canada neighbors. Mutual resource concerns include: nitrates in groundwater, pathogens, nutrients and toxics (e.g., asbestos) in surface waters, stream flows supporting fish and farms and pollutants in the air. Our frustration is that they are not providing the same level of protection to our shared natural resources.

Our State: Much of our funding comes from the State of Washington. So we work within broad, legislatively defined goals including:

- Improve water quality in streams, rivers, lakes and Puget Sound
- Improve air quality
- Reduce the amount of toxics released into the environment
- Maintain healthy fish and wildlife populations
- Support responsible agriculture and timber management as the best stewards of our natural resources

Our District: The District's Board of Supervisors developed this Long Range Plan based upon their knowledge of local resource needs and issues as informed by their individual experiences (farming, ranching, forestry & education), watershed plans and staff, public & stakeholder input. The Whatcom Conservation District interacts with other key decision-makers in our community.

Function of the Whatcom Conservation District

Our function is to make available, focus and coordinate technical, financial and educational resources, from whatever their source, so that they meet the needs of the local land manager in advancing the conservation of soil, water and related natural resources.



We Serve & Why

- We want to achieve:
 - No net loss of Whatcom Co. prime soil farmland
 - Improved Water Quality and Quantity to reopen shellfish harvest areas, improve fish habitat and availability to farmers, ranchers & producers
 - Regulatory fairness in the development and application of state laws and local ordinances to agriculture based upon best available science
 - An improved reputation for the district and local farmers, ranchers and producers
 - A Rate & Charge to provide a dependable base of funding for District core programs and activities
- We want to preserve:
 - Voluntary, incentive-based programs to afford landowners flexible, effective options to remain economically viable while addressing natural resource concerns
 - A multi-disciplinary team of professionals who can effectively assist landowners with their conservation choices.
 - The conduct of research, educational or demonstration projects on local farms to advance the knowledge and adoption of effective conservation practices
- We want to avoid:
 - Conflict and litigation within our community over water quality, quantity and habitat.
 - Loss of Whatcom's status as the seventh leading agricultural county in the state
 - Imposition of "one-size fits all" solutions when less intrusive, tailored solutions are available to achieve both individual and community objectives.
- We want to eliminate:
 - The negative impression created in landowner minds when they are referred to us for assistance by regulatory agencies.
 - Ineffective tenor and forms of communication to foster greater understanding and appreciation for conservation
 - Potential losses to fire due to the lack of defensible spaces and unhealthy forest lot management.

Our Mission

- The Whatcom Conservation District assists land managers with their conservation choices.

Our Vision

- Whatcom County shall have healthy soils, water and air while maintaining sustainable and productive agriculture, fisheries, and other natural resource-based industries.
- The District shall be acknowledged as the independent and trusted agency of choice for leadership in the conservation, protection and stewardship of natural resources.

Our Values

- To serve all the people of Whatcom County (urban, suburban & rural) by providing the highest quality of technical assistance and education on the application of best management practices.



- The development and application of best management practices that protect natural resources and promote sustainable use of those resources ensuring their availability to future generations.
- To promote stewardship of natural services as the best alternative to regulation and coercion.
- We believe that principles of conservation and agriculture should be included in K-12 education.

Natural Resource Data & Information:

- From 2000 to 2015 the population of Whatcom County has grown 27%, to 212,284 residents.
- Water quality over the Portage Bay shellfish harvest areas has and continues to decline closing or conditioning harvest to hundreds of acres.
- There is an increased potential for litigation over water quality, water quantity and lack of fish habitat.
- There is increased insecurity of farmers due to political pressure to lessen the historic priority of protecting farmland from flooding and promoting the conversion of productive farmland to habitat through government buyouts.
- With the increasing age of landowners and operators, and current tax and land use regulations, there will be continued changes in the character of our agriculture.
- There is increasing conversion of farmland to rural residences with increasing frequency of keeping livestock and poultry on small acreages resulting in an increasing concentration of livestock onto a shrinking land base.
- Increasing demands for water and lack of processes to resolve current water rights issues.
- There is a continuing need to improve management practices using our evolving understanding of the functioning of the Whatcom county environment.
- There is increased regulatory oversight/intervention to achieve Endangered Species Act (ESA) and Clean Water Act (CWA) goals. We expect recognition for agriculture achievements in this area.
- There are increasing impacts from climate change including: Less water stored as snow, increased winter rain intensity and flooding, decreased growing season precipitation, and increased sea levels impacting river delta farmland.

Comment [HB1]: Is that an accurate statement?

Criteria for Selecting Conservation Priorities: The action(s) will

- Support and sustain agriculture into the future with practical, effective conservation choices and protecting working lands from flooding and urbanization
- Meet the needs of the landowner as well as the needs of our community as identified in local salmon recovery, shellfish harvest area protection and watershed plans.

Priority Natural Resource Conservation Needs & Geographic Areas, Measures of Success and Goals:

- District natural resource conservation concerns in priority order are:
 1. Poor water quality (too much bacteria in surface water & nitrate in groundwater)
 - ~~2-1. Too little water in the lower tributaries of the Nooksack River, Dakota, California and Terrell Creeks~~
 - ~~3-2. Inadequate fish & wildlife habitat (fish blockages, lack of vegetation & channel complexity)~~
 - ~~3-2. Potential negative impacts to agriculture from climate change~~
 - ~~4-3. Loss of working lands~~
 - ~~4. Inadequate fish & wildlife habitat (fish blockages, lack of vegetation & channel complexity)~~
 - ~~5. Poorly functioning drainage systems.~~
 - ~~6. Potential negative impacts to agriculture from climate change~~
 - ~~5-7. Too little water in the lower tributaries of the Nooksack River, Dakota, California and Terrell Creeks~~

Comment [HB2]: Suggested reprioritizing of concerns.



- Critical geographic areas for natural resource conservation in the district are:
 - For water quality concerns, drainages that lead to recreational or commercial shellfish harvest areas.
 - For habitat concerns, the South Fork of the Nooksack and Lowlands of Whatcom County
 - For water quantity concerns, areas within Watershed Improvement, Diking and Drainage District boundaries.
 - For climate change concerns, Western Whatcom County
- Measures of Success
 - Bacterial pollution from livestock operations no longer contributes to the closure of shellfish harvest areas.
 - There will be appropriate vegetative buffers along 20 miles of agricultural watercourses without negatively affecting other resource concerns.
 - There will be no net loss of farmland to development.
 - There will water management plans in each of the Watershed Improvement Districts that address drainage & fish.
 - Staff will be informed as to how climate change could be considered in the plans they develop.
- Goals
 1. Protect and enhance water quality for beneficial uses by addressing nitrate in groundwater and fecal coliform of the Nooksack River and its lowland tributaries; California, Dakota and Terrell Creeks; and Sumas River.
 - a. Strategy – Assist livestock operators to capture, store and apply the manure generated by their animals.
 - b. Strategy – Assist berry and crop farmers with their use of manure.
 2. Improve fish and wildlife habitat by establishing appropriate riparian cover along watercourses and wetlands on agricultural lands
 - a. Strategy -- Deliver an effective program of voluntary restoration of riparian and wetland areas to advance locally developed plans that recover fish without eroding Whatcom's base of prime farmland.
 - b. Strategy -- Work with others (Whatcom County, Cities, Special Districts, Tribes and other stakeholders) to restore natural processes.
 3. Conserve and enhance Whatcom County's Green Infrastructure Network.
 - a. Strategy – Support the County's creation and implementation of effective programs for the purchase or transfer of development rights
 - b. Strategy – Ensure that there is a farm plan alternative to standard buffers in the County's Critical Areas Ordinance
 - c. Strategy -- Build confidence in the agricultural community that there will be land and water for them now and into the future
 - d. Strategy – Advocate for the County to Integrate a Green Infrastructure plan into its land use plans with the object of protecting working lands and creating opportunities for farmers and landowners to sell environmental services.
 4. Protect and enhance water quantity for beneficial uses



- a. Strategy -- Assist Drainage and Watershed Improvement Districts in developing and implementing maintenance plans that provide drainage for growing crops yet protect instream values.
 - b. Strategy -- encourage the widespread adoption of water conservation practices;
 - c. Strategy -- re-establish important watershed processes through the construction of enhancement of wetlands;
 - d. Strategy -- work with homeowners and businesses to adopt low impact development practices.
5. Protect agriculture and rural residents from the anticipated potential negative impacts of climate change
- a. Strategy -- Develop climate adaptation strategies
 - b. Strategy -- Work with stakeholders to explore river corridor management options that anticipate increased winter flooding due to more intense rain and rain into higher elevations.
 - c. Strategy -- Work with stakeholders to encourage irrigation efficiencies that will be needed when summer precipitation decreases and air temperatures increase.
 - d. Strategy -- Work with rural residents and communities to establish defensible space to reduce potential loss from forest fire.

Information – Education & District Operations Priorities, Measures of Success, and Goals:

Information & Education

- **Goals**
 1. Farmers, ranchers, producers, and landowners will exhibit good conservation stewardship by protecting and enhancing soil health, water quality/quantity and wildlife habitat.
 2. All Whatcom County residents and elected officials will value natural resource-based industries (farming, forestry and fishing) such that they support the protection of working lands and support their local land managers.
 3. The Whatcom Conservation District will be a vital part of community interaction being seen as a trusted advisor, with a depth of understanding of both the regulatory framework and effective beneficial land management practices.
- **Strategies**
 1. Identify and cultivate potential leaders from farmers, ranchers, producers and landowners to be good examples of conservation stewardship to the community.
 2. Promote our local farming and ranching industries through diverse interactive opportunities (elementary school presentations, tours, internships)
 3. Maintain a professional, motivated, multi-disciplinary staff

District Operations

- **Goals**
 1. Provide effective, practical and economical management practice recommendations to farmers, ranchers, producers and landowners to facilitate their voluntary adoption of conservation practices that prevent/reduce resource pollution.
 2. Convince regulatory agencies, the public and legislators as to the value of the empowering farmers, ranchers, producers and landowners to voluntarily select and implement conservation practices that



achieve environmental values while maintaining the productivity and economic viability of their operations.

3. Build climate resilience in farming. identifying and adapting management practices and infrastructure to avoid potential negative impacts due to projected changes in climate.

- Strategies

1. Enable landowners to adopt the conservation practices needed to achieve the District's natural resource goals through a program of technical and financial assistance.
2. Implement the Washington Discovery Farms Program in Whatcom County and beyond to demonstrate the impact of various land management and conservation practices on water quality.
3. Assist farmers, producers, and landowners in understanding their symbiotic interactions with resources (i.e., surface water, groundwater, soil) through research and demonstration projects.
4. Provide technical expertise and science based input on local and state programs, policy, regulation, and/or practices that affect farmers, ranchers, producers and landowners.

Land Manager Needs

- Rural livestock owners need technical and financial assistance to implement conservation practices that are protective of surface and groundwater resources from nutrients or bacteria.
- Rural landowners need technical and financial assistance to improve fish and wildlife habitat by replacing fish barriers, establishing riparian forest or hedgerow buffers or installing large woody debris.
- Urban landowners need assistance retrofitting their parcels with rain gardens and other practices to reduce contaminated stormwater runoff.
- Farmers and ranchers need to see how conservation practices can improve water quality, quantity and contribute to their economic bottom line.
- Rural residents and communities need assistance in creating defensible space to lessen the potential impacts of forest fire.

FY 2017 Milestones, Timeline & Actions

Priority: Reduce Nutrient & Bacterial contamination of surface and groundwater.

Measurable Goal: Bacteria trends show significant decline in Dakota, California, Bertrand, Fishtrap, Kamm, Scott Ditch and Tenmile watershed.

Milestones	Timeline	12 Month Actions
10 Operations	FY 2017	Assist NRCS in the designing/installation of NWQI & EQIP funded conservation practices.
4 Operations	FY 2017	Design/install Conservation Commission funded conservation practices
4 Operations	FY 2017	Design/install Whatcom County funded conservation practices for non-dairy operations
100 Landowners	FY 2017	Assist in developing conservation plans
20 Berry Growers	Dec 2016	Assist in proper use of manure as a fertilizer or soil amendment

Priority: Inadequate fish & wildlife habitat (fish blockages, lack of vegetation & channel complexity)

Measurable Goal: 35 Habitat Enhancement Projects

Milestones	Timeline	12 Month Actions
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25 New CREP Projects installed	June 2017	Enroll landowners, complete plans, obtain approval oversee installation and contractor payment.
120 CREP Projects maintained	June 2017	Complete inventories, prescriptions, oversee maintenance and contractor payment.
25 CREP Projects re-enrolled	June 2017	Complete inventories, draft plans and obtain approval to re-enroll projects into the program.
Remove 10 fish barriers	June 2017	Assist landowners to replace culverts to provide fish passage
Install 2 riparian mitigation projects	June 2017	Assist Whatcom County River & Flood to install riparian plantings required as part of flood protection projects.

Priority: Potential negative impacts to agriculture & rural residences from climate change

Measurable Goal: Reduce fire loading around rural residences and provide training to staffs on Climate Change.

Milestones	Timeline	12 Month Actions
Obtain funding for Firewise Activities	July 2016	Develop a scope of work and obtain funding for FY 2017.
Develop a Community Firewise Plan	December 2016	Work with one or more communities to develop a plan to become Firewise
Reduce fire loads around rural residences	June 2017	Help rural landowners to develop Firewise plans and remove fire loading.
Climate Change Training	June 2017	Identify and create opportunities for staff to receive training on climate change germane to their programs

Priority: Loss of working lands

Measurable Goal: No net loss of Whatcom County farmland to development.

Milestones	Timeline	12 Month Actions
Identify District's representative on Whatcom County Ag Advisory Committee	Sept 2016	To advance the District's Long Range Plan of work
CAFO Permit	August 2016	Provide comments to Dept. of Ecology to help protect water resources without unduly burdening livestock operations.
Discovery Farm	Sept 2016	Install edge of field monitoring stations to assess conservation practice effectiveness
Workshops/field days	June 2017	Provide training to livestock operators on practices that can add to bottom line while protecting water quality
Green Infrastructure	June 2017	Participate in efforts to create markets for farmers to sell environmental services.

Priority: Too little water in the lower tributaries of the Nooksack River, Dakota, California and Terrell Creeks

Measurable Goal: Water conservation practices are included as a priority in the EQIP program

Milestones	Timeline	12 Month Actions
Participate in Local Work Group	Oct 2016	Work to elevate water conservation measures as priority for EQIP funding



Assist Watershed Improvement Districts	Jun 2016	Help in development of watershed plans to garner funding for water conserving practices.
Lagoon Pasteurization Project	Dec 2016	Pilot technology that makes potable water from liquid manure

Staffing Needs

- *Water Quality:* Dairy Resource Specialist, Non-dairy Resource Specialist, Engineer, Engineering Technician, Stormwater Specialist.
- *Education/Outreach & Research:* Educator, Educator Assistant, Research Scientist, Research Assistant, Intern.
- *Habitat/Firewise:* Restoration Specialists (3), Program Assistant, Firewise Specialist.
- *Administration:* Executive Director, Administrative Specialist, IT/Cartography Specialist, Office Assistant.

Annual Budget Needs

Programs	Full-time Equivalents	Estimated Funding
Water Quality (Livestock & Urban)	5	\$ 396,000
Habitat Enhancement	5	\$ 406,000
Education/Outreach & Research	4	\$ 319,500
District Operations	3	\$ 238,750
	17	\$ 1,360,250
Overhead (25%)		\$ 340,063
TOTAL:		\$ 1,611,562

Washington Conservation Districts assisting land managers with their conservation choices