

2019 COMPREHENSIVE WATER SYSTEM PLAN
City of Blaine, Washington
AGENCY COMMENTS AND RESPONSES

Comprehensive Water System Plan (WSP) submitted to:

- Whatcom County (Planning, Engineering, Health)
- State Department of Health
 - DOH submitted a copy to Department of Ecology
- Birch Bay Water and Sewer District
- Dakota Creek Golf Club Water System
- Bell Bay Jackson Water Association

Comments received from:

- Whatcom County (Health, Public Works¹) - Conditions as noted (attached to Local Government Consistency Determination Form, signed by Mark Personius, January 14, 2020)
- Department of Health (letter from Richard Rodriguez and Laura McLaughlin to City of Blaine, April 3, 2020)
- Department of Ecology (letter from Thomas Perkow to City of Blaine, March 4, 2020)
- City of Blaine and CHS/DEA – in the course of further review by the City of Blaine additional revisions were made and are documented herein

FORMAT:

Agency Comment numbered

WC#:	Whatcom County Comments
DOH#:	Department of Health Comments
DOE#:	Department of Ecology Comments
DOEG#	Department of Ecology General Comments and Notes
DOEF#	Department of Ecology Comments on Future Growth
CITY#	City of Blaine or CHS/DEA initiated revisions

Italicized text: City of Blaine response to agency comment, immediately following the comment, with revisions of the WSP, if any, noted therein.

WHATCOM COUNTY

Local Government Consistency Determination Form – Conditions

The City of Blaine Comprehensive Water System Plan is deemed consistent with County plans, subject to the following:

WC1: The service area in the City of Blaine Comprehensive Water System Plan does not match the service area in the Whatcom County Coordinated Water System Plan (CWSP). Therefore, the City will:

¹ Engineering responded with approval, with guidance for future construction activities to be coordinated with the County as appropriate.

- a. Update the boundary in the CWSP to match the boundary in the Water System Plan. This requires the City to submit a new “Declaration of Water Utility Service Areas” (CWSP Exhibit 4-1), with an associated map, and document it has followed the CWSP procedures (Exhibit 4-2) that are applicable to the City.

A Declaration of Water Utility Service Area will be submitted after Plan Adoption.

- WC2: The City of Blaine Comprehensive Water System Plan refers to the 2016 version of the Whatcom County Comprehensive Plan. Change these references to the 2018 Whatcom County Comprehensive Plan, which is the most recent version (pp.1-6, 2-7, and 10-1).

This plan was prepared based on the 2016 County Comprehensive Plan. However, a footnote has been added for each reference cited above for clarification as follows:

¹ The 2016 and 2017 versions of the County Comprehensive Plan were current at the time this section of the WSP was prepared and are the basis for the information presented herein. The County Comprehensive Plan was subsequently updated in 2018, 2019 and 2020.

- WC3: The revised City of Blaine – Comprehensive Water System Plan will be submitted to the County Planning and Development Services Department (one hard copy and one electronic copy).

The Plan will be submitted to the County as requested.

DEPARTMENT OF HEALTH

- DOH1: Description of Water System - Provide a Statement of Local Government Consistency from Whatcom County Planning

An LGC response has been received from the County since the previous submittal of the plan. It has been added to Appendix N. (Copies of the approval letters from Whatcom County Health and Public Works have also been added to Appendix N.)

- DOH2: Basic Planning Data - Thank you for the description of how the data was analyzed to calculate the ADD on page 2-5. I understand that the MDD was calculated based on daily source data (p. 2-12). Will you please provide more data and explanation from your MDD analysis? Was the MDD used in this planning document from a particular year? What were the MDDs for historical years? What were the MDD/ADD ratios for historical years and where does 2.2 fit within historical MDD/ADD ratios?

As stated on page 2-12, the MDD/ADD ratio for the planning document is based on the average of MDD/ADD ratios from 2007 to 2016 as determined from the historical well production data. Such data is summarized in a new Table F-1 added to Appendix F. The table is referenced from a new second sentence in the paragraph following Table 2.2 and at the end of the paragraph following Table 2.5, as follows.

See Tables F-1 and F-2 in Appendix F for additional water supply and demand data.

DOH3: Basic Planning Data - Please list out the PHD formula from the DOH design manual, as well as your rationale used to calculate Blaine's PHD for retail customers (p. 2-12).

The eighth paragraph of section 2.2.6 has been revised to read:

The PHD demand forecast was calculated in two parts due to the significant wholesale demand for the system: for the wholesale customers, and for the retail customers. For analysis purposes, the highest-demand day for all three systems (Blaine, BBJWA and BBWSD) is assumed to be the same day. Over the course of that day, demand will exceed the MDD values, reaching a PHD. BBJWA and BBWSD are presumed to draw their MDD volume at relatively constant rates over the course of that day. The additional supply needed to meet PHD in Blaine's wholesale customers should be supplied by each customer's storage facilities. Therefore, the wholesale impact on Blaine's PHD is just the combined MDD of the two wholesale customers. PHD for the City's retail customers is calculated according to the DOH formula for PHD:

$$PHD = (ERU/MDD /1440) [(C)(N) + F] + 18$$

Where:

PHD = Peak Hourly Demand, total system (gallons per minute

C = coefficient associated with ranges of ERUs

N = number of ERUs based on MDD

F = factor associated with ranges of ERUs

ERU/MDD = Maximum Day Demand per ERU (gallons per day)

PHD for Blaine's total system is the sum of the MDD for BBJWA and BBWSD plus the PHD for Blaine's retail customers. The resulting ratio of PHD/MDD for total system demand decreases through the forecast period from 1.31 to 1.29.

DOH4: Basic Planning Data - Table 2-5 provides combined annual source data. Please also provide monthly and annual well production numbers for each source to capture seasonal variation in production at each source.

As noted above, new tables are referenced from a new second sentence in the paragraph following Table 2.2 and at the end of the paragraph following Table 2.5, as follows. Table F-2 presents a summary of monthly well production by well for 2011-2019.

See Tables F-1 and F-2 in Appendix F for additional water supply and demand data.

DOH5: Basic Planning Data - Please provide seasonal variation in consumption by customer class to enable your readers to identify trends by customer class throughout the year.

Figure F-1 has been added to Appendix F showing average per-month usage for the period 2009-2019 to display seasonal variation in consumption.

DOH6: System Analysis – Ideally, the system analysis demonstrates that the current system has adequate source, storage, and distribution capacity to meet all projected demands during the 10-year planning period from 2018 through 2028. However, your current and near term projected demands (City demands plus wholesale customer demands) are very close to exceeding the physical capabilities of the City’s sources as well as other water system facilities. Consequently, the draft plan identifies some significant improvements and related work that must be completed in the near term to meet the projected needs of your water system. The WSP must be further expanded to demonstrate your commitment to completing the improvements that are necessary to mitigate these deficiencies.

The primary limitations or constraints on growth are reliability of source of supply and storage capacity. The Capital Improvement Plan includes specific projects or further study to confirm the most cost-efficient way to address these needs. Continued coordination with BBWSD is recommended and such coordination has been ongoing for several years. BBWSD has taken the lead in completing exploratory wells for additional water supply. In 2019 the City began work on wells that are identified in the WSP as underperforming their prior capacity and/or water right capacity, and physical capacity improvements have been made. Improvements to the City SCADA system are also ongoing to support more automated and informed management of the supply and storage systems.

The summary of work completed in 2019 and 2020 for the City's wells has been revised in Section 3.3.1 as follows.

The parenthetical statement at the end of the fourth paragraph in the Source Capacity Analysis section has been deleted.

The following paragraph has been added following the fourth paragraph in the Source Capacity Analysis section.

Wells #1R, 2, 3R, and 4 were cleaned and rehabilitated in 2019. A new motor or pump was installed for each as appropriate and variable frequency drives (VFDs) were added to each. New meters were installed on three of the four wells and all are connected to the City's SCADA system. Wells #5 and 5.1 were cleaned and rehabilitated in 2020 and each was equipped with a VFD and a new meter and connected to the City's SCADA system. A new pumphouse was completed for Well #5. Well #4.1 is connected to the SCADA system and is scheduled for cleaning and rehabilitation.

DOH7: System Analysis – What were the acceptable pressures under each condition analyzed in your hydraulic analysis? For example, under MDD and PHD conditions, was 30 psi considered “appropriate pressure?” Was 20 psi the target for MDD + FF?

Section 3.1.6 discusses the pressures required for different types of storage, and the scenarios those storage elements are used for. The minimum pressure for MDD and PHD is 30 psi, and the minimum pressure for MDD plus FF is 20 psi, as indicated in Section 3.1.8 and the footnotes for Table 3.16.

DOH8: System Analysis – Was the hydraulic model calibrated? If so, how? If not, what measures were taken to ensure that the model is a reasonable representation of the water system?

The hydraulic model used for the City's 2009 WSP was updated and calibrated by RH2 Engineering, Inc. in 2011. That model was used as the basis for the hydraulic modeling for this WSP, with appropriate updates of system demand and substantive pipe network updates.

DOH9: System Analysis – Has the water system implemented an asset management program, which includes a remaining useful life assessment of major water system facilities, and estimated costs to replace those facilities?

The City has elements of an asset management program, primarily based on water system data in the City's geographic information system (GIS). The existing data is limited to basic main and appurtenances information,

but other attributes, operation and maintenance requirements and history needs to be developed. The City is preparing to develop a comprehensive asset management program for all enterprise systems (water, power, sewer, stormwater, roads, etc.).

DOH10: System Analysis – Include a distribution water quality analysis or strategy. Parameters such as pH, alkalinity, conductivity, chlorine residual, HPC, ORP and others that can be used to establish seasonal baseline data. Data can be used to ensure optimized corrosion control, inform O & M decisions, inform asset management decisions, and provide baseline water quality data with which to compare in an emergency contamination situation.

The City will develop a strategy to expand its water quality monitoring program to periodically analyze distribution system water quality for the following parameters, as recommended by DOH: alkalinity, ammonia, bromide, pH, phosphate, silica, sulfide and total organic carbon. A project confirming this has been added to Tables 4, 8.1 and 8.2, as follows: P-4 Water Quality Baseline Sampling Plan N/A \$15,000 2021

Tables 4, 8.1 and 8.2 have been updated to include the additional planning project.

DOH11: Water Use Efficiency/Water Rights – Address the March 4, 2020 correspondence from Department of Ecology.

Responses to those comments are included below.

DOH12: Source Protection – Page 5.5; Recommended Improvements: Notifications of wellhead protection boundaries to State, local entities, residents, and customers is recommended. Provide a schedule to accomplish those tasks.

The following paragraph has been added to the end of Section 5.2:

Notification of wellhead protection boundaries will be provided to State, local entities, residents, and customers within 180 days of boundary changes.

DOH13: Operations and Maintenance – Does the City have a DBP monitoring plan that includes the location of DBP sample sites? Please include one in this plan. Systems with populations over 3,300 must have a DBP monitoring plan. You can find a template on our website.

The City has had a Disinfection Byproduct Monitoring Plan since 2008, as indicated in Section 6.4.

DOH14: Operations and Maintenance –

Coliform Monitoring Program:

- a. The coliform sampling regime is comprehensive and well distributed. The maps include all necessary information.

Acknowledged.

- b. The CMP mentioned a maximum contaminant level (MCL) for total coliform. With the revised total coliform rule of 2016, there is only a treatment technique trigger for total coliform.

The contaminant level discussion of the CMP has been revised to reflect the referenced revision for alignment with the 2016 revised rule. The updated CMP is included in Appendix K.

- c. One recommended improvement to the coliform monitoring practices would be to distribute the collection of coliform through-out each month. For example, collect 3 samples on Week 1, 2 samples on Week 2 and 1 Sample on Week 3 rather than all 7 routine samples on one day which is the practice.

The CMP has been revised to reflect collection of monthly samples through-out the month rather than all in one week.

DOH15: Distribution Facilities Design and Construction Standards – Chapter 7 has several sections that pertain to the City's approval of As-Built documents, and Appendix M has post construction testing requirements. However, I did not see requirements for Construction Completion Reports, and pressure and bacteria testing and records. Note that DOH requires the City to collect and retain copies of Construction Completion Reports (CCRs), and pressure and bacteria testing, for all completed projects. Please either include this information or direct me to where it is located in this plan.

The following paragraph has been added to the end of section 7.5:

Following completion of construction, disinfection, flushing, and pressure testing, a Construction Completion Report is completed by the City Engineer, or their delegate under their supervision, and filed with the project records.

DOH16: Distribution Facilities Design and Construction Standards – Thank you for outlining hydrostatic testing requirements in Section 4.18.000 of Appendix M. What is the City's acceptable pressure differential from the beginning to the end of the 15 minute test? At what pressure differential would the City reject the result and have further requirements for the contractor?

The referenced City section includes reference to AWWA and WSDOT standards. WSDOT Specification Section 7-09.3(23) includes requirements for hydrostatic pressure testing, including allowable volume of makeup water as a function of the test pressure, pipe diameter and length of the tested section.

DOH17: Distribution Facilities Design and Construction Standards – Section 7.3.7 (page 7-5) outlines the customer requirements to install, pay for, own, and maintain booster pumps in areas of the distribution that where minimum pressure is not available. How will the City ensure that maintenance practices meet their standards for these non-City-owned pumps? For example, does the City inspect them and have access to them?

These privately owned booster pumps are to be maintained by the customer and are to be installed on the customer side of the meter. The City does not take responsibility for these facilities.

DOH18: Improvement Program – Thank you for clearly listing out all projects in Table 8.1 of the CIP, with the page that you identified the need for the project. Please also call out or highlight projects in Table 8.1 that are addressing deficiencies in the capacity analysis (sources, treatment, storage, or distribution) within the planning period (before 2028). These projects are a high priority and must be included in the budget. We cannot approve a plan unless all deficiencies in the capacity analysis (during the planning period) are addressed with projects in the CIP that are also in the budget.

Table 8.1 has been revised to include an additional column to mark which projects are for additional capacity.

DOH19: Miscellaneous – This document contains a SEPA Checklist. Provide a SEPA Threshold Determination with the final WSP.

The SEPA Threshold Determination is located in Appendix N.

DOH20: Miscellaneous – Prior to DOH approval, the City's elected governing body must approve and adopt the WSP.

*The revised plan has been approved and adopted per Ordinance **XXX** on **DATE**. This ordinance is included in Appendix N.*

DOH21: Miscellaneous – Please provide copies of any comments made by adjacent purveyors or other interested parties along with the City's response to those comments.

All comments received by the City are included in this document and in Appendix N of the Plan.

DOH22: Miscellaneous – Is the City a member of WAWARN?

No, the City is not a member of WAWARN.

DEPARTMENT OF ECOLOGY

DOE's comments and City responses are summarized below. DOE included a comment and response form that that has been completed with this same information.

DOE1: It is unclear why the Q_a of the water right claim identified in the Plan (G1-300037CL) is listed as non-additive in Table 4-6: Table 4-6 indicates that "per Well 9 ROE" the Q_a is non-additive. However, the ROE for Permit G1-26822P does not identify this claim as non-additive. Rather, the ROE correctly identifies this as a claim for a vested water right. Only a Superior Court can determine the extent and validity of this claim. Please clarify the status of this claim and describe why the claim is shown to have non-additive Q_a . If indeed this claim is non-additive, please identify which water right the claim is non-additive to.

G1-300037CL is a groundwater claim (submitted to Ecology in 1997) that relates to a "vested" groundwater water right for the deep aquifer that Well #1 was completed within in 1928 ("vested" groundwater rights with a priority date of 1928). The City's claim has an instantaneous rate (Q_i) of 800 gallons per minute (gpm) and annual quantity (Q_a) of 1,290 acre-feet per year (afy), which are additive to the City's portfolio of water rights. The City also has a vested surface water claim for use of springs prior to the City's use of wells. Both claims for vested rights were acknowledged by DOE in 1956. Table 4.6 has been revised to reflect the correct additive/non-additive water right totals.

The third paragraph of Section 4.3.1 has been revised to read as follows.

The City's water rights also limit the annual withdrawal from each well (Q_a). In response to an application for rights for Well #9 (known as the "Well #9 Report of Examination"), DOE indicated the City's water rights for Wells 3, 4, 4.1, 5, 7, 8, 8.1 and 9 were limited to 2,560 acre-feet per year (AFY). The Q_a per groundwater claims, permits and certificates for Wells #1, 1R, 2, 2D, 5.1 and 6 is 3,991.6 AFY. Therefore, the total annual Q_a for the City's portfolio of water rights is 6,551.6 AFY, not including the vested spring claim which has not been quantified at this time. This volume of Q_a equates to approximately 2.135 billion gallons per year or approximately 5.85 MGD. When compared to the projected ADD, this value allows the City to meet the projected annual demands beyond year 2038.

DOE2: Table 4.5 and the DOH's Sentry site indicate that the well described by Claim G1-300037CL has been abandoned (Well #1). This well is not described in Chapter 3's "Wells Within the Well Field" and "Well Outside the Well Field" sections where the City's active wells are described. Metering data submitted to Ecology by the City assign Q_a values to this claim. Please describe the status of Well #1 and provide supporting documentation. Ecology notes that wells no longer being used shall be decommissioned pursuant to WAC 173-160 -381. Please indicate which well the Q_a values assigned to this claim refer to in the metering data.

Well #1 was drilled and installed in 1928 within the City's Watershed to a total depth of 746 feet based on information presented in a "Log of Well for City of Blaine" document (included in Appendix F). Well #1 was a point of withdrawal (POW) for a "vested" groundwater right in the deep regional aquifer that underlies the City's Watershed (also referred to as the well field in the WSP) and most of northwest Whatcom County. Well #1 was operated as a source of municipal groundwater for the City beginning in 1928 under their "vested" groundwater right, that was further quantified under Claim G1-300037CL ($Q_i = 800$ gpm, $Q_a = 1,290$ afy), until 1995 when the well was abandoned by Charon Drilling. Charon Drilling did not provide the City with an abandonment log for Well #1 nor could one be found on file with Ecology.

DOE3: Table 4.5 indicates that Well #1R is a replacement well for Well #1. No supporting documentation for Well #1R being drilled as a replacement well for Well #1 could be located in the Plan, the ROE for G1-26822P (the Well #9 ROE), or the ROE for G1-26821P (the ROE authorizing the use of Well #1R). In addition, it appears Well #1R is completed into a deeper aquifer than Well #1. The Plan identifies this well as requiring submission of documentation for source approval by DOH on Page 3-54. Please clarify what is meant by "Replacement for Well #1" in Table 4.5 for Well #1R and provide supporting documentation, if available. Well #1R may also need to have a change application submitted and processed to Ecology for this well.

By the early 1990s Well #1, operating under the "vested" groundwater right for the deep regional aquifer, was over 60 years old and was no longer capable of producing adequate volumes of water. The City concluded that it would soon be necessary to replace the water capacity provided by Well #1. The following is an approximate timeline of the actions the City took to provide a replacement for the water being provided by Well #1.

- 1. On November 13, 1992 the City submitted to Ecology an application (G1-26821) to withdraw groundwater from "Well No. 1" (requested $Q_i = 450$ gpm, $Q_a = 720$ afy).*
- 2. The City contracted the drilling and installation of Well #1R in*

1995. Well #1 and Well #1R are located within 100 feet of each other (same ¼ ¼ section), have similar wellhead elevations, and are completed at depths between 700 and 750 feet. Both wells are completed in the deep regional aquifer that underlies the Blaine Groundwater Management Area.

3. Well #1R was put into service in the summer of 1996 and operated under the City's "vested" groundwater right until April 2010 when the Report of Examination (ROE) for G1-26821 was signed by Ecology. Since April 2010, Well #1R has been operated under the "vested" groundwater right and groundwater right G1-26821P.

4. Table 1 in the Well 9 ROE states "Well #1; originally drilled in 1926, redrilled in 1992, in deep aquifer". It is likely that the "redrilled in 1992" refers to the drilling of Well #1R but mistakenly notes the priority date of G1-26821 as the drilling date of Well #1R. It should also be noted that City historical records indicate that Well #1 was drilled and installed in 1928 (see well log in Appendix F).

5. Well #1 was abandoned in 1995 by Charon Drilling.

6. No change application is necessary for Well #1R to continue to operate under G1-26821P.

DOE4: Ecology notes that Well #2 operates under Permit G1-26820P for 200 gpm and 320 ac-ft/yr, both additive. This Permit is in good standing with its CC due on December 31, 2024.

Acknowledged.

DOE5: Table 4.5 and the DOH's Sentry site indicate that Well #3 has been abandoned. No discussion on this well could be found in the Plan. One of the Provisions under Permit G1-26822P requires that Well #3 be decommissioned before Well #9 comes online. The Plan indicates that Well #9 is online. Table 4.6 indicates that this well has been decommissioned and its rights transferred to Well #3R. Please describe the status of Well #3, identify whether it has been properly decommissioned, and provide supporting documentation. Please describe the legal mechanism for the transfer of said rights and how that was completed.

Well #3 was abandoned by B&C Well Drilling on September 26, 2011. Well abandonment documents have been added to Appendix F.

*It appears that no legal mechanism was used to add Well #3R as an additional POW to G1-*05086C. However, because Well #3R is located in the same ¼ ¼ section as was Well #1 and it is completed within the same deep regional aquifer as Well #1, Well #3R can and has been operated under the City's "vested" groundwater right that was established for the deep regional aquifer that Well #1 was completed within in 1928.*

Furthermore, the City has added Well #3R as an additional POW to G1-26821P (Well #1R) and G1-26820P (Well #2) through the Showing of Compliance process. Copies of the completed Showing of Compliance Forms are included in Appendix F.

DOE6: The Water Right authorizing the use of Well #3 is GWC 03912. The ROE for GWC 03912 (aka G1-*05086CWRIS) indicates that this water right is supplementary. Ground Water Permit #1861, vested surface water springs and a vested ground water claim to a well drilled in 1926 are identified as existing sources at the time (1959).

- a. Ground Water Permit #1861 became Certificate 05917 (aka G1-*02042CWRIS) and authorizes the use of Well #7 at up to 320 gallons per minute (gpm) and 448 acre-feet per year (ac-ft/yr).

Acknowledged

- b. The vested surface water springs are not mentioned in the Plan. (These may have relinquished pursuant to chapter 90.14 RCW or been abandoned and no longer available to the City. Does the City use spring water? What is the status of the spring water?)

The City of Blaine's only source of municipal water between 1886 and 1928 was a system of seven springs located in the Watershed. The spring system and a single groundwater well (Well #1) located in the Watershed were the only sources of municipal water for the City between 1928 and 1961, when Well #3 was installed and operated in the Watershed. Well #7 was drilled and installed within the City limits in 1929. However, since iron and manganese is higher in this well than in other sources, Well #7 has only been used as an emergency fire-flow and emergency backup well since it was installed.

The spring collection system associated with the "vested" spring right is described in detail on a map prepared by Hammond, Collier & Wade-Livingston Associates, Inc. (HCWL) dated August 8, 1979 (see HCWL Watershed Well Location Map in Appendix F). The HCWL map shows the notation "ABND" (indicating abandoned per map legend) next to the spring collection wells. It should be understood that HCWL used this term to indicate that the spring collection wells were not being used for everyday municipal purposes in 1979. HCWL did not use the term to indicate that the wells were legally abandoned per WAC 173-160.

The "vested" spring and deep regional aquifer water rights are acknowledged and described in the following ROEs written by

Ecology or the Washington State Department of Conservation – Water Resources Division (WSDC):

1. *G1-*05086C, Well #3 (WSDC, 1959) – “The City of Blaine has obtained most of their winter water from springs (apparently under claims of vested rights) and have supplemented the spring supply during heavy water demand months from a deep well, which was drilled in 1926 (vested ground water claim).”*
2. *G1-*10178C, Well #8 (WSDC, 1969) – “In addition applicants claim vested rights from wells and springs in their watershed area.”*
3. *G1-*07623C, Well #4 (WSDC, 1970) – “The City of Blaine also claims vested rights on seven springs located in the watershed property”.*
4. *G1-26822P, Well #9 (Ecology, 1998) – Table 1 of ROE in reference to G1-300037CL, “city has filed a claim for a vested right.”*

The spring collection system was an important component of the City’s municipal water system into the 1960s, when the installation of additional groundwater wells (Well #3 and Well #4) in the watershed reduced the City’s need for the water produced from the springs.

Since roughly the mid-1970s, the spring collection system has generally been maintained as an emergency backup for municipal and fire-protection purposes, and to provide water to the Blaine School District for use in educational and fisheries related projects. Several of the original spring collection wells and associated piping still exist in the Watershed and are in operational condition. Further, the original intertie between the reservoir and the primary transmission line to the City shown on the HCWL map still exists and could quickly be made operational to address emergency needs, if necessary.

The City has not abandoned or relinquished the “vested” water rights associated with the spring collection system and/or the deep aquifer that Well #1 was completed within. As mentioned by Ecology in their March 4, 2020 letter to the City, “Only a Superior Court can determine the extent and validity of this claim.” It is the City’s contention that the spring and groundwater “vested” rights discussed in the above referenced ROEs are valid and should be considered additive to the City’s water right portfolio.

- c. The vested groundwater right to the 1928 well was further quantified by claim G1-300037CL)

Well #1 was the original POW for the City's 1928 "vested" groundwater right from the deep regional aquifer. Claim G1-300037CL appears to refer to the City's 1928 "vested" groundwater right in that it provides further quantification of the "vested" right.

DOE7: Table 4.5 indicates that Well #3R is a replacement well for Well #3. No supporting documentation for Well #3R being drilled as a replacement well for Well #3 could be located in the Plan or in Ecology's digital file documents. The Plan identifies this well as requiring submission of documentation for source approval by DOH on Page 3-54. Well #3R may need to have either a change application submitted and processed for this well or a Showing of Compliance with RCW 90.44.100(3) form completed and submitted to Ecology for this well.

See response to Comment DOE5 above.

DOE8: Ecology notes that the ROE for GWC 5315-A (aka G1-*07623CWRIS), authorizing the use of Well #4, indicates that this right is partially supplemental to claimed vested rights on seven springs, GWC 3912, and Permit 6158. (Permit 6158 issued as supplemental to existing rights. Certificate 3912, a claim to vested rights on the 1926 well, and vested rights to spring water were identified as the existing rights at the time the ROE issued (1963). This Permit cancelled in 1966.) This right limited the water system's total Q_a to 2,240 ac-ft/yr.

*The ROE for G1-*07623C indicated that GWC 3912 (G1-*05086C) and GWP 6158 were the "only water rights recorded for the City of Blaine." The ROE noted that the City has "vested rights on the seven springs located in the watershed property" but it is unclear how or even if the ROE accounted for the water use under the "vested" spring right. Further, the ROE fails to identify and account for the City's previously discussed "vested" groundwater right. The ROE for G1-*07623C also incorrectly indicated that GWP 1861 (G1-*02042C) with a priority date of July 9, 1951 was cancelled and, therefore, did not include that right in the described accounting of the City's total water right portfolio. Therefore, it would seem likely that the Q_a limitation of 2,240 ac-ft/yr set by the G1-*07623C ROE was significantly flawed.*

*Table 1 of the Well 9 ROE supersedes the G1-*07623C ROE and more accurately describes the City's water rights, claim, pending application, and authorized quantities. However, Table 1 does omit the City's "vested" right for the spring system located within the watershed. The Well 9 ROE states "Total annual quantity for the City of Blaine from this right and all existing rights shall be limited to 2,560 acre-feet per year." The Q_a limitation stated in the Well 9 ROE is specific to the City's water "rights" and does not include the City's "vested" groundwater and spring water rights, which*

should be considered supplemental to and in addition to the Q_a limitation of 2,560 afy stated in the Well 9 ROE.

DOE9: Ecology notes that Well #4.1 was drilled as an additional well to Well #4. A showing of compliance with RCW 90.44.100(3) form was completed and submitted to Ecology for this well in 2005.

Acknowledged

DOE10: Ecology notes that Certificate G1-22483C authorizes the use of Well #5 for 450 gpm additive and a supplemental 726 ac-ft/yr. This is consistent with Table 4.5.

Acknowledged

DOE11: Ecology notes that Permit G1-28481P authorizes the use of Well #5.1 for 1100 gpm and 850 ac-ft/yr, both additive. This is consistent with Table 4.5.

Acknowledged

DOE12: Well #6 is identified in Tables 4.5 and 4.6 as a permit-exempt well. A discussion on this well in Chapter 3 of the Plan (Page 3-15) indicates that this well is not connected to the water system and currently not in service. Clarify how this well is related to the City's portfolio of water rights. This well may benefit from consolidation under RCW 90.44.105. See Ecology's Water Resource Program Policy 1230 for more information.

The permit-exempt annual quantity added to the City's portfolio of water rights is equal to the maximum daily permit-exempt volume (5,000 gallons) of indoor water use multiplied by 365 days, which is equal to 5.6 afy. The 80 gpm value was used in the City's 2009 WSP. It appears this was its pump capacity at one point in time.

DOE13: Ecology notes that Well #7 operates under GWC 5917-A (aka G1-*02042CWRIS), mentioned above under Bullet 5a. This is consistent with Table 4.5.

Acknowledged

DOE14: Ecology notes that Well #8 operates under GWC 6916-A (aka G1-*10178CWRIS) for additive 300 gpm and supplementary 288 ac-ft/yr. This is consistent with Table 4.5.

Acknowledged

DOE15: Well #8.1 operates under a change application to GWC 5917-A (CGI-*10178CWRIS), where Well #8.1 was added to GWC 5917-A. The Change ROE and Table 4.5 indicate that this well is also added to GWC 6916-A; a Showing of Compliance form was submitted to add this well to GWC 6916-A in 2008. The change ROE is in good standing with its Proof of Appropriation of Water (PA) form due on December 31, 2024. It is unclear why the value of 320 is entered into Table 4.5 under the Q_a column, please clarify.

An error in data entry placed the value of 320 for the Q_i column to overwrite the Q_a value. Table 4.5 has been corrected to display 320 gpm Q_i and 448 afy Q_a . This revision prompted a change to Table 4.6 to only show each water right once and multiple sources per right. Revised Tables 4.5 and 4.6 are included in the Plan.

DOE16: Ecology notes that Well #9 operates under Permit G1-26822P for 200gpm and 320 ac-ft/yr, both additive. This Permit issued in 1998 and is in good standing with its PA due on October 30, 2024.

Acknowledged

DOE17: Ecology notes that Well #2D operates under Permit G1-28046P for 500 gpm and 806 ac-ft/yr, both additive. This Permit issued in 2010 and is in good standing with its CC due on December 31, 2024. Table 4.5 and a discussion on Page 3-16 indicate this well is not in service. Metering data from 2018 and 2019 show zero Q_a for this well.

Acknowledged

General Comments and Notes:

DOEG1: After addressing Ecology's comments above, different Q_i and Q_a values may result. Revised Q_i and Q_a calculations, if any, should be incorporated into the Plan, specifically under Section 4.3.1.

The revised calculations are included in Tables 4.5 and 4.6 and total Q_i has been updated in Section 4.3.1 as noted in response to Comment DOE1.

DOEG2: Many of the water right authorizations germane to this WSP are subject to metering orders or provisions. Flow meter installations, recordings, and reporting are to be in compliance with chapter 173-173 Washington administrative Code (WAC). Metering data submitted to Ecology by the City has not included Q_i measurements as required. The Plan should discuss compliance with chapter 173-173 WAC, the metering data, how these data relate to each right, and address any exceedances.

The referenced WAC includes a lot of “may” statements with respect to what DOE may require to be reported. The City believes it is reporting required data. Recent improvements to its telemetry system allow essentially continuous flow rate and daily volume monitoring and such data is stored by the City in the telemetry system history records, and data required by the City’s various water rights are reported to DOE.

DOEG3: Ecology notes that for years 2002 – 2019, the Q_a reported by the City hovers around 1,800 – 2,000 ac-ft/yr. It appears that some double-counting may have occurred for wells 5 and 5.1 in 2019. Ecology metering staff welcome the opportunity to view the metering set up in the field to better understand the system and how metering data are being reported.

The City invites Ecology staff to observe the well metering system.

DOEG4: Many of the water right authorizations germane to this WSP are subject to chloride monitoring orders or provisions. No discussion on how these orders and provisions are being complied with was found in the Plan. The Plan should discuss the chloride monitoring results and address any anomalies/trends/exceedances.

Chloride and conductivity are required to be monitored at varying frequency in the POWs associated with the following City of Blaine water rights.

<u>Water Right</u>	<u>POW</u>	<u>Frequency</u>
G1-26822P	Well #9	No specified schedule
G1-26821P	Well #1R	Apr, Aug
G1-26820P	Well #2	Apr, Aug
G1-28046P	Well #2D	Quarterly
G1-28481P	Well #5.1	Apr, Aug>>

The City monitors chloride and conductivity in the active production wells in accordance with the Washington State Department of Health requirements for Group A Public Water Systems. Chloride and conductivity have not been detected at concentrations/levels that exceed their respective drinking water maximum contaminant levels in the water samples obtained from the wells. This data is on file with the City of Blaine.

The City is in the process of developing/implementing a plan to collect and analyze the chloride and conductivity data in accordance with the provisions in the ROEs listed above. The strategy will include annual analyses of the cation/anion parameters necessary to type the water using piper diagrams, as has been done in the past. Also, the strategy will include collection of water samples from two wells in the shallow/intermediate aquifer and from two wells in the deep regional aquifer for C14 age dating every five years.

DOEG5: Many of the water right authorizations germane to this WSP are subject to static water level monitoring requirements. No discussion on how these orders and provisions are being complied with was found in the Plan. The Plan should discuss these monitoring data and address any anomalies/trends.

The following paragraphs have been added to Section 3.3.1, just prior to the heading Source Capacity Analysis:

The City uses their SCADA system to monitor and record SWLs and pumping water levels on a near continuous bases in their production wells, with the exception of Well #2D. Well #2D is not currently in use. However, the water levels in this well are monitored on a near continuous basis using a pressure transducer/data logger system as part of a groundwater monitoring program being completed by Whatcom County. The SCADA and Well #2D water level data are on file with the City and are available for review by Ecology upon request.

A review of the water level monitoring data on file with the City indicates that the static water levels in the vicinity of the City's wells have generally been slowly lowering and rising in a normal response to the varying annual volumes of water that is pumped from the wells and the resultant well interference effects from other City wells.

Comments on Future Growth:

DOEF1: After addressing Ecology's comments above, Revised Q_i and Q_a calculations should be made and incorporated into the Plan, specifically under Sections 4.3.2 and 4.4.2.

The revised calculations are included in revised versions of Tables 4.5 and 4.6. Revisions of the values in these tables did not lead to need for changes in the narrative in Sections 4.3.2 and 4.4.2. The total Q_a has been updated in Section 4.3.1, as noted above.

CITY OF BLAINE

CITY1: Misc. Changes

- a. Revised Plan Date
The revised plan has been dated July 2019, Revised April 2021 on cover, title pages and footers.
- b. Revised engineering firm
The engineering firm that completed the revisions to the Plan is David Evans and Associates, Inc.; however, the same licensed professional

engineer has been responsible for preparation of both the July 2019 and Revised April 2021 plans. The following note has been added on the title page adjacent to the professional engineer's stamp.

This water system plan was initiated by CHS Engineers, LLC and this deliverable was completed by David Evans and Associates, Inc. The licensed professional whose stamp is affixed hereto has continuously acted as the professional in responsible charge and prepared or directed all phases of the work and this water system plan.

c. DOH Source Approval

Chapter 3 and the CIP indicates that Source Approval is necessary for Wells #1R and 3R (Project SU-3). This statement is based on status as noted on the WFI and in the prior WSP. The City has records of submittal of the source approval documents for these wells to DOH in 1997, a request for additional information from DOH in 1997, and the City's response with the requested information in early 1998. The latter document has been added to Appendix F. It is the City's position that further action is not necessary.

The sixth paragraph under Wells Within the Well Field in Section 3.3.1 has been revised to include the following statement, after the statement regarding source approval requirements:

The City has records of submittal of the source approval documents for Well #1R to DOH in 1997, a request for additional information from DOH in 1997, and the City's response with the requested information in early 1998. The latter document has been added to Appendix F. It is the City's position that further action is not necessary for source approval for Well #1R. Further coordination with DOH is planned to confirm this source is documented as approved.

The eighth paragraph under Wells Within the Well Field in Section 3.3.1 has been revised to include the following statement, after the statement regarding source approval requirements:

The City has records of submittal of the source approval documents for Well #3R to DOH in 1997, a request for additional information from DOH in 1997, and the City's response with the requested information in early 1998. The latter document has been added to Appendix F. It is the City's position that further action is not necessary for source approval for Well #3R. Further coordination with DOH is planned to confirm this source is documented as approved.

- d. *Well rehabilitation work was completed in 2019 and 2020. As part of that rehabilitation work, pumps were replaced and the installed pump capacity at many wells changed as a result of this effort. Tables 3.2, 3.3, 3.4, 3.5, 3.6, and 3.8 and associated discussion of supply and storage in Chapter 3 have been revised to reflect the new well pump capacities. Sections 3.3.1 through 3.3.4 have been revised accordingly. Table 4.6 has been updated as well. Appendix H has been revised accordingly.*
- e. *The discussion in Section 3.3.1, Source of Supply, regarding Well #7 water quality has been revised to state that "...and this source has higher hardness and manganese levels than other City sources."*
- f. *Tables 4, 8.1, 8.2 and 9.2 have been revised to reflect a higher planned expenditure for water main replacement for the first ten years of the capital planning period. Chapter 9 has been revised to reflect refinements in the potential additional debt necessary to support that increased planned expenditure.*
- g. *Appendix N - Review Comments*
Appendix N has been updated to include the following:
- *July 2019 plan submittal letters*
 - *Whatcom County Local Government Consistency Checklist with conditions of approval*
 - *Department of Ecology comments*
 - *Department of Health comments*
 - *Summary of Agency comments*
 - *City Ordinance adopting Plan as revised (pending submittal and action)*
 - *Whatcom County Approval (pending submittal and action)*
 - *Department of Health Approval (pending submittal and action)*