**NORTH BEND DRY YEAR WATER SUPPLY/DEMAND ESTIMATION**

PROJECTED NORTH BEND WATER DEMAND (PEAK MONTHS JULY-SEPTEMBER) VS. WATER AVAILABILITY

DEVELOPED BY THE FRIENDS OF THE SNOQUALMIE VALLEY TRAIL AND RIVER 4/4/2020

The draft report *City of North Bend Water Supply and Mitigation Forecast* by Golder Associates (October 2019) does not include a scenario for evaluating mitigation adequacy using only the current mitigation sources available for the City’s water supply. All scenarios discussed in the report (Table ES-1) include theoretical mitigation from Sallal Wells and/or the Cascade Golf Course, which are currently not available for use.

Without access to the database and the GoldSim model, it was not possible to determine adequacy of current available mitigation on an annual basis, if there were a dry year such as 2015. Thus the following table summarizes the analysis that was performed to determine if there would be adequate mitigation during the dry time of the year using the data from the draft Golder report. This is a snapshot in time, but demonstrates whether adequate mitigation is an issue.

The following table summarizes this analysis given North Bend’s current water and mitigation supply. All three years selected (2015, 2020 and 2025) show insufficient mitigation water available during peak demand months (July-September) given a dry weather year like 2015. The table is followed by an explanation and/or source of the data. **The final column of the table shows negative values which means that for all three years there is insufficient mitigation supply for a dry year.**

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| YEAR | CITY WATER DEMAND (WSA) | CITY WATER SUPPLY | 10 SUPPLY VERSUS DEMAND(CFS) |
| 1 DEMAND (MGY) | 2 AVERAGEDAILY DEMAND (MGD) | 3 PEAK DAY DEMAND (MG) | 4 PEAK DAY DEMAND (CFS) | 5 Mt SI SPRINGS (CFS) | 6 HOBO SPRINGS MITIGATION (CFS) | 7 WWTP MITIGATION (CFS) | 8 CENTENNIALMITIGATED DRAW (CFS) | 9 TOTAL MITIGATED SUPPLY (CFS) |
|   |   |   |   |   |   |   |   |   |   |   |
|   |   |   |   |   |   |   |   |   |   |   |
| 2015 | 205 | 0.562 | 1.17 | 1.82 | 0.5 | 0.5 | 0.53 | 1.03 | 1.53 | -0.29 |
|   |   |   |   |   |   |   |   |   |   |   |
| 2020 | 250 | 0.685 | 1.43 | 2.22 | 0.5 | 0.5 | 0.69 | 1.19 | 1.69 | -0.53 |
|   |   |   |   |   |   |   |   |   |   |   |
| 2025 | 440 | 1.21 | 2.53 | 3.92 | 0.5 | 0.5 | 1.37 | 1.87 | 2.37 | -1.55 |
|   |   |   |   |   |   |   |   |   |   |   |
|  |  |  |  |  |  |  |  |  |  |  |

**KEY**

MGY = million gallons per year

MGD = million gallons per day

CFS = cubic feet per second

WSA = North Bend Water Supply Area as used in the Golder report

**PROJECTED CITY WATER DEMAND**

Column 1: Water Demand for the City of North Bend. Year 2015 from Table A-9 in draft Golder Report (October 2019). Years 2020 and 2025 estimated from Figure B-1, Scenario 5, in the draft Golder Report (October 2019).

 Column 2: Average daily water demand = Column 1/365 (days in a year).

 Column 3: Peak Day MG per day = Column 2 X 2.09, which is Peaking Factor from North Bend’s 2010 Water Supply Plan.

 Column 4: Peak Day CFS = Column 3 X 1.55 (converting MG/day to CFS).

 **PROJECTED WATER SUPPLY FOR PEAK MONTHS JULY – SEPTEMBER**

Column 5: 0.5 CFS from Mt. Si Springs for supply. Estimated from Figure A-2 in draft Golder Report. Graph shows Mt. Si Springs flow is low during this time of year. During a dry year we are estimating it could go as low as 3.5 CFS, thus only 0.5 CFS available for supply with City’s new pumps (as 3 CFS required for by-pass). Note: it could possibly go lower.

Column 6: 0.5 CFS from Hobo Springs available for mitigation. Estimate based on minimum daily flow during September as shown in Figure A-4 in draft Golder Report. Figure is attached. Note y-axis in acre feet per day which is equal to 0.5 CFS.

Column 7: Wastewater Treatment Plant (WWTP) return flow credit for mitigation = 40% of projected peak day demand (Column 4). Based on review of WWTP credit during peak time of year as reported in 2009 – 2019 Golder annual mitigation system reports for City of North Bend a factor of .4 (40% of Centennial withdrawals) was determined. Again, we believe this is a conservative factor (conservative meaning that it is allowing for high end of estimated water available) for this time of year mainly because WWTP return is based on average of previous 365 days of Centennial withdrawals. The total WWTP return flow has been factored up proportionate to the growth in demand.

Column 8: Centennial Mitigated Draw = the amount of water that can be drawn from the Centennial Well based on the amount of mitigation available, which is equal to Column 6 + Column 7 (Hobo Springs plus WWTP credit).

Column 9: Total Mitigated Supply = Column 8 + Column 5 (Centennial Mitigated Draw plus Mt. Si Springs).

**SUPPLY VS DEMAND**

Column 10: Total Mitigated Supply of Water versus Peak Day Demand = Column 9 minus Column 4. Negative numbers indicate insufficient mitigation available.

**CAVEAT REGARDING THE DATA USED IN ANALYSIS**

Our analysis is based on the same data provided by Golder in their DRAFT October 2019 Mitigation Report as well as annual Golder Mitigation Reports and therefore inherits any limitations their base data may present. Three examples of possible data limitations follow:

* Golder states that “At the time the model was constructed, records were not sufficient to understand the seasonal limitations of Mt Si Spring source." (See Golder Report section 5.1) Being able to account for seasonal variations is important to assessing what is occurring during low-flow months. Also, this quote appears to be inconsistent with information in Figure A-2 which graphs seasonal differences.
* Hobo Springs had 18 missing years of data (1982-2000) Numerous failures could have occurred in these 18 years for which there are no records. The relative importance of this data gap is unknown.
* We’ve been unable to account for 160 residential units which may be missing from Golder’s demand calculations. Due to the way the data are presented, vetting these numbers is impossible.

**POSTSCRIPT REGARDING JUST RELEASED 2020 NORTH BEND WSP**

The 2020 North Bend Water System Plan (WSP) has been so recently released for review that no data from the document was used in this assessment. However it is worth noting that the Executive Summary states:

 “The City anticipates growth of approximately 2.5 percent over the 10-year planning period and has adequate water rights, source, and storage capacity to meet the water demand projected over the next 10 years. However, the City is at or near its mitigation capacity limits. Mitigation capacity dictates how much water can be withdrawn from the Centennial Well. Unfortunately, during the dry summer months high overall water demand coincides with a severely limited withdrawal capacity from Mount Si Springs. As a result, the City must depend on the Centennial Well for the majority of its water production. This often coincides with low instream flows in the Snoqualmie River which leads to increased mitigation requirements. Under present peak summer demand, if a drier summer were to occur, the flows at Hobo Springs would be at or just below those required to properly mitigate water demand. The City must therefore increase its mitigation capacity by implementing two measures. 1. Enact water conservation policies that curb peak season water use….. 2. Obtain additional sources of mitigation water…..”

**The WSP entirely supports our conclusion that the City has inadequate supply at the present time to meet demands in the event of a dry year.**