Nisqually Watershed
Successful Implementation of RCW 90.94.020

Decision Points

June 6, 2019
Lisa Dally Wilson, PE
WRIA 15 WRE Committee
CONTENTS

- The Nisqually Watershed - Overview
- RCW 90.94.020 Planning Process in WRIA 11
- Sub-basin Delineations
- Consumptive Use Estimates
- Offsets - Micro and Macro (NEB) Approach
- Offset Projects and Policies
- Next Steps
History of Collaboration
- Nisqually River Council - 1987
- 2003 Nisqually Watershed Plan
- Plan Addendum in Response to RCW90.94.020

Nisqually Tribe - Planning Unit Lead

RCW90.94.020 - 3000 gpd - maximum daily consumption per connection

Adopted by Ecology - February 1, 2019
PLANNING UNIT MEMBERS

IMPLEMENTING GOVERNMENTS

• Nisqually Indian Tribe - LEAD
• Thurston, Pierce and Lewis Counties

OTHER PARTICIPANTS

• Cities of Lacey, Olympia, Yelm
• Town of Eatonville
• Thurston PUD
• WDFW, WA Dept of Ag, Ecology
• Nisqually River Council Citizens Advisory Committee
“Characterize and quantify potential impacts to instream resources from the proposed 20-year new domestic permit-exempt water use at a scale that allows meaningful determinations of whether proposed offsets will be in-time and/or in the same sub-basin.”

“Suitably sized sub-basins”

If available, estimates of:
- Timing of impacts
- Proportion of flow impacted

“Anticipated benefits to instream resources from actions [projects and policies] designed to restore streamflow will offset and exceed projected impacts from new water use”
1. Define and Delineate Appropriately Sized Sub-basins
2. Estimate 20-Year Population Growth and New Dwelling Units
3. Calculate New Domestic Permit-Exempt Connections
4. Estimate Consumptive Use (3 methods)
5. Identify Projects and Actions to Offset 20 years of Consumptive Use
6. Quantify/Develop Projects and Actions as Offsets
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Impacts of permit-exempt use on streamflow – Little Spokane River Watershed

Modeled average reduction in flow (cfs) during July, August, September at Dartford Gage

<table>
<thead>
<tr>
<th>Year</th>
<th>2040 Permit Exempt Demand</th>
<th>2040 Climate Change No Additional Demand</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>-0.26</td>
<td>-14.5</td>
</tr>
<tr>
<td>2006</td>
<td>-1.42</td>
<td>-13.4</td>
</tr>
<tr>
<td>2007</td>
<td>-0.44</td>
<td>-14.4</td>
</tr>
<tr>
<td>2008</td>
<td>-1.72</td>
<td>-21.8</td>
</tr>
<tr>
<td>2009</td>
<td>-2.35</td>
<td>-24.6</td>
</tr>
<tr>
<td>2010</td>
<td>-1.08</td>
<td>-19.6</td>
</tr>
<tr>
<td>2011</td>
<td>-1.01</td>
<td>-30.7</td>
</tr>
<tr>
<td>2012</td>
<td>-0.56</td>
<td>-27.3</td>
</tr>
<tr>
<td>2013</td>
<td>-0.58</td>
<td>-29.4</td>
</tr>
</tbody>
</table>
1. Define and Delineate Appropriately Sized Sub-basins
2. Estimate 20-Year Population Growth and New Dwelling Units
3. Calculate New Domestic Permit-Exempt Connections
4. Estimate Consumptive Use (3 methods)
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6. Quantify/Develop Projects and Actions as Offsets
Step 1  
Define appropriate sub-basins
Committee Decision Point

✓ Approve Proposed Sub-basins

• **Estimate 20-Year Population Growth and New Dwelling Units**

• Calculate New Domestic Permit-Exempt Connections

• Estimate Consumptive Use (3 methods)

• Identify Projects and Actions to Offset 20 years of Consumptive Use

• Quantify/Develop Projects and Actions as Offsets
WRJA 11: Estimate Growth

Step 2
22 Year Population Growth and New Dwelling Units (2018-2040)

- 3 Counties, 3 methods
- Thurston - TRPC growth projections
- Pierce - Historical percentages of permit-exempt well growth by sub-basin
- Lewis - growth projections
- 22 Year Projection (through 2040)
- Not a PU decision point in WRIA 11
✓ Approve Proposed Sub-basins

• Estimate 20-Year Population Growth and New Dwelling Units (Optional Decision Point)

A. Counties provide using their chosen growth forecasting methods (Nisqually: 2018-2040)

OR

B. Committee Oversight of methodology and assumptions inherent in the method
✓ Approve Proposed Sub-basins
✓ Estimate 20-Year Population Growth and New Dwelling Units (Optional Decision Point)
• Calculate New Domestic Permit-Exempt Connections
• Estimate Consumptive Use (3 methods)
• Identify Projects and Actions to Offset 20 years of Consumptive Use
• Quantify/Develop Projects and Actions as Offsets
Step 3
Calculate New Domestic Permit-Exempt Well Connections

- By County, by sub-basin
- Cities, Towns to weigh in on PE well policies within their jurisdictions and UGAs
- PUDs - provide information on available connections
- Dept of Health Sentry database, other options to ID available connections in existing Group A and B systems
### Step 3

**Calculate new domestic permit-exempt connections, 2018-2040**

<table>
<thead>
<tr>
<th>Sub-basin</th>
<th>UGA Connections</th>
<th>Rural Connections</th>
<th>Total Connections</th>
</tr>
</thead>
<tbody>
<tr>
<td>McAllister</td>
<td>39</td>
<td>116</td>
<td>155</td>
</tr>
<tr>
<td>Thompson/Yelm</td>
<td>1,036</td>
<td>526</td>
<td>1,562</td>
</tr>
<tr>
<td>Lackamas/Toboton/Powell</td>
<td>-</td>
<td>430</td>
<td>430</td>
</tr>
<tr>
<td>Lower Nisqually</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Mashel River</td>
<td>20</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Prairie Tributaries</td>
<td>596</td>
<td></td>
<td>596</td>
</tr>
<tr>
<td>Ohop Creek</td>
<td>27</td>
<td></td>
<td>27</td>
</tr>
<tr>
<td>Upper Nisqually (Lewis, Pierce, Thurston)</td>
<td>195</td>
<td></td>
<td>195</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1,075</strong></td>
<td><strong>1,912</strong></td>
<td><strong>2,987</strong></td>
</tr>
</tbody>
</table>
Committee Decision Point

✓ Approve Proposed Sub-basins
✓ Estimate 20-Year Population Growth and New Dwelling Units (Optional Decision Point)
✓ Calculate New Domestic Permit-Exempt Connections (Optional Decision Point)

• Estimate Consumptive Use (3 methods)
• Identify Projects and Actions to Offset 20 years of Consumptive Use
• Quantify/Develop Projects and Actions as Offsets
### Step 4

**Estimate Consumptive Use**

<table>
<thead>
<tr>
<th>Method</th>
<th>Annual Average Consumptive Use per connection (gpd)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
</tr>
<tr>
<td>Actual Water Use – Thurston PUD Method</td>
<td>95 gpd</td>
</tr>
<tr>
<td>Ecology Method</td>
<td>223 gpd</td>
</tr>
<tr>
<td>Legal Method</td>
<td>1,644 gpd</td>
</tr>
</tbody>
</table>

**Ecology guidance:**
- 10% indoor use is consumptive
- 80% outdoor use is consumptive
Possible Committee Decisions

• Estimate Consumptive Use
  • Methodology (Actual, Ecology, Legal, other)
  • Average Annual Basis or other (consider how you will compare to streamflow)
  • Indoor per person water use (Ecology Guidance - 60 per person per day)
  • Outdoor irrigable land (assume 1/2 acre or determine specific average area with GIS analysis)
  • Crop type and irrigation requirements
  • Irrigation efficiency percentage
  • Assumed consumptive portion of total use (Ecology Guidance -10% indoor, 80% outdoor)
## WRIA 11 – Consumptive Use Results

**Estimate New Domestic Permit-exempt Well Connections and Associated Consumptive Use 2018 – 2040**

<table>
<thead>
<tr>
<th>Sub-Basin</th>
<th>Total PE Connections</th>
<th>Annual Consumptive Use (AFY)</th>
<th>Cubic feet/second</th>
<th>cfs per connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>McAllister</td>
<td>155</td>
<td>39</td>
<td>0.054</td>
<td></td>
</tr>
<tr>
<td>Thompson/Yelm</td>
<td>1,562</td>
<td>390</td>
<td>0.539</td>
<td></td>
</tr>
<tr>
<td>Lackamas/Toboton/Powell</td>
<td>430</td>
<td>107</td>
<td>0.148</td>
<td></td>
</tr>
<tr>
<td>Lower Nisqually River</td>
<td>2</td>
<td>0</td>
<td>0.001</td>
<td></td>
</tr>
<tr>
<td>Mashel River</td>
<td>20</td>
<td>5</td>
<td>0.007</td>
<td></td>
</tr>
<tr>
<td>Prairie Tributaries</td>
<td>596</td>
<td>149</td>
<td>0.206</td>
<td></td>
</tr>
<tr>
<td>Ohop Creek</td>
<td>27</td>
<td>7</td>
<td>0.009</td>
<td></td>
</tr>
<tr>
<td>Upper Nisqually (all counties)</td>
<td>195</td>
<td>49</td>
<td>0.067</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>2,987</strong></td>
<td><strong>747</strong></td>
<td><strong>1.032</strong></td>
<td><strong>0.0003453</strong></td>
</tr>
</tbody>
</table>
### Step 4

#### 3 METHODS to Calculate Consumptive Water Use

<table>
<thead>
<tr>
<th>Method</th>
<th>Nisqually Watershed: Projected Annual Average Average Consumptive Use (AFY)</th>
<th>(CFS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actual Water Use – Thurston PUD</td>
<td>318</td>
<td>0.439</td>
</tr>
<tr>
<td>Ecology Method</td>
<td>747</td>
<td>1.032</td>
</tr>
<tr>
<td>Legal Method</td>
<td>5,501</td>
<td>7.598</td>
</tr>
</tbody>
</table>
USGS – McKenna Gage on Nisqually River
August Mean Discharge, 2000-2010

Watershed Offset Requirement

1.03 cfs

469 cfs
✓ Approve Proposed Sub-basins
✓ Estimate 20-Year Population Growth and New Dwelling Units (Optional Decision Point)
✓ Calculate New Domestic Permit-Exempt Connections (Optional Decision Point)
✓ Consumptive Use (3 methods)
  • Identify Projects and Actions to Offset 20 years of Consumptive Use
  • Quantify/Develop Projects and Actions as Offsets
Identify Offset Projects and Actions

**Micro Mitigation (Offsets)**

- City of Yelm - Water Right Offset (future + current)
- Water System Improvements (Group A and B)
- Water Right Acquisition
- Reclaimed Water Infiltration
- Local Stream Restoration - Lower Sub-basins
- Managed Aquifer Recharge (MAR)
- Update County permitting processes - policies for Implementation - bank, credit system

Projects had varying levels of development: some conceptual, some quantitative
Step 5

Watershed Scale Offsets

Macro Mitigation (Offsets)

- Address Major Barriers to Salmon Recovery
- Community Managed Forests (VELMA Model)
- Large Scale Floodplain and Riparian Restoration & Protection Projects (Ohop Creek)
- Mashel River Baseflow Strategies - Eatonville Infrastructure Improvements

Projects had varying levels of development: some conceptual, some quantitative
It is very important to coordinate Salmon Recovery efforts and Water Resource/ISF efforts!

Start the Conversation Early!
<table>
<thead>
<tr>
<th>Salmon Recovery Initiative</th>
<th>Priority</th>
<th>Sub-Basin</th>
<th>Key Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mashel Watershed Recovery/Community Forest</td>
<td>1</td>
<td>Mashel</td>
<td>Acquire commercial forestland to place in conservation management for streamflow enhancement</td>
</tr>
<tr>
<td>Ohop Watershed Recovery/Community Forest</td>
<td>7</td>
<td>Ohop</td>
<td>Acquire commercial forestland to place in conservation management for streamflow enhancement</td>
</tr>
<tr>
<td>Bald Hills Watershed Recovery/Community Forest</td>
<td>8</td>
<td>Lack/Tob/Powell</td>
<td>Acquire commercial forestland to place in conservation management for streamflow enhancement</td>
</tr>
<tr>
<td>Mashel Base Flow</td>
<td>2</td>
<td>Mashel</td>
<td>Implement Town of Eatonville stormwater and infrastructure improvements</td>
</tr>
<tr>
<td>Ohop Valley Floodplain Restoration</td>
<td>3</td>
<td>Ohop</td>
<td>Restore 3.1 miles of channelized stream and 710 acres of riparian and floodplain habitat</td>
</tr>
<tr>
<td>Mashel River Riparian Corridor Protection and Restoration</td>
<td>4</td>
<td>Mashel</td>
<td>Protect riparian corridor and restore habitat complexity through log jams and riparian plantings</td>
</tr>
<tr>
<td>Muck Creek Recovery*</td>
<td>5</td>
<td>Prairie Tributaries</td>
<td>Restore up to 60 miles of impaired streams and surrounding floodplain/wetland habitat; maintain hydrologic function of prairie ecosystem through prescribed burns</td>
</tr>
<tr>
<td>Prairie Tributaries Recovery*</td>
<td>6</td>
<td>Prairie Tributaries, Thom/Yelm, Lack/Tob/Powell</td>
<td>Restore up to 20 miles of impaired streams and surrounding floodplain/wetland habitat; maintain hydrologic function of prairie ecosystem through prescribed burns</td>
</tr>
<tr>
<td>Barrier Removal*</td>
<td>9</td>
<td>Multiple</td>
<td>Remove fish passage barriers</td>
</tr>
</tbody>
</table>
Ohop Creek Restoration
## Consumptive Use (Ecology Method) Compared to Minimum and Maximum Estimated Offsets (See Table 7-2)

<table>
<thead>
<tr>
<th>Sub-basin</th>
<th>ECY Method Annual PE Consumptive Use (cfs)</th>
<th>Offset Actions (cfs) MIN</th>
<th>Offset Actions (cfs) MAX</th>
</tr>
</thead>
<tbody>
<tr>
<td>McAllister</td>
<td>0.054</td>
<td>TBD</td>
<td>TBD</td>
</tr>
<tr>
<td>Thompson/Yelm</td>
<td>0.539</td>
<td>0.479</td>
<td>1.050</td>
</tr>
<tr>
<td>Lackamas/Toboton/Powell</td>
<td>0.148</td>
<td>0.116</td>
<td>0.697</td>
</tr>
<tr>
<td>Lower Nisqually</td>
<td>0.001</td>
<td>0</td>
<td>0.552</td>
</tr>
<tr>
<td>Mashel River</td>
<td>0.007</td>
<td>3.48</td>
<td>7.27</td>
</tr>
<tr>
<td>Prairie Tributaries</td>
<td>0.206</td>
<td>0.058</td>
<td>2.058</td>
</tr>
<tr>
<td>Ohop Creek</td>
<td>0.009</td>
<td>0.017</td>
<td>2.105</td>
</tr>
<tr>
<td>Upper Nisqually (Pierce, Lewis, Thurston)</td>
<td>0.067</td>
<td>0.067</td>
<td>0.619</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>1.03</strong></td>
<td><strong>4.22</strong></td>
<td><strong>14.35</strong></td>
</tr>
</tbody>
</table>
Step 5: Projects and Actions

- Don’t forget the Actions
- Track Potential Actions throughout the process
  - Consider PE well connection policies (cities, towns, PUDs)
  - Consider PE well replacement opportunities
  - Tracking system
    - Track PE wells development vs. Offsets
    - Track credits (e.g., well abandonment, other)
    - Ensure that offsets keeps up with well development
Nisqually Plan Addendum did not provide full analysis of all projects or their probability of occurring per interim NEB guidance

Nisqually Planning Unit Core Strategy
- Micro-offset projects provide sub-basin specific offsets
- In coordination with the Nisqually Salmon Recovery Strategy, macro-offset projects recommended will, in combination with ‘micro projects’ and actions, provide NEB
“This addendum to the Nisqually Watershed Plan identifies specific mitigation strategies and policy recommendations designed to offset the impacts that new PE wells may have on streamflows or other senior water rights. It also, in coordination with the Nisqually Salmon Recovery Strategy, makes recommendations for habitat projects that will, in combination with mitigation strategies, provide NEB for streamflows in the Nisqually Watershed” (Nisqually PU, 2019).

“While the WRIA 11 watershed plan Addendum does not adhere to Ecology’s guidance documents…. Taken as a whole, the results indicate that relative to the detriments created by future permit-exempt domestic wells anticipated in WRIA 11 over the next 20 years, the offset strategies proposed would result in a NEB for the watershed.”

“The Plan Addendum provides varying levels of details and analyses (for the 22 strategies presented) . . . In light of the conceptual nature of much of the plan’s description of strategies, Ecology’s technical review segregated the strategies into 3 tiers.”

Adoption with Conditions

- Annual Reporting
- Five Year Self Assessment
- Ongoing Compliance with RCW 90.94.020 (recording and reporting requirements)
✓ Approve Proposed Sub-basins
✓ Estimate 20-Year Population Growth and New Dwelling Units (Optional Decision Point)
✓ Calculate New Domestic Permit-Exempt Connections (Optional Decision Point)
✓ Estimate Consumptive Use (method and assumptions)
✓ Identify Projects and Actions to Offset 20 years of Consumptive Use
  • Quantify/Develop Projects and Actions as Offsets
Step 6
Quantify/Develop Projects & Actions as Offsets

Next Steps

- Planning Unit is doing this now through December, moving toward implementation
- Re-evaluating priorities from Tiers determined by Ecology in their NEB evaluation
- Considering implementation barriers, multiple benefits, concerns regarding MAR effectiveness, and unintended consequences of water purchase on Ag.
- Find Funding: Good Plan, Needs Action/investment
- Accounting System??: How do we ensure offsets keep pace with growth? 3 Counties, one
Lessons Learned

- Focus time and effort on developing robust offset actions providing multiple benefits - **Offset Projects**

- 20 years of domestic PE Consumptive Use is a relatively small impact to streamflow - conservatively estimate and move on to the important part

- Work collaboratively with local salmon groups - overcome the language barrier between Water Resource and Salmon Recovery Scientists

- **QUANTIFY** your offsets

- Aim for multiple benefits, multiple goals, and consider reaching big

- **TRUST and PARTNERSHIPS and HISTORY** of collaboration **MATTER**
Thank You!

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