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To: Mike Hermanson – Spokane County Environmental Services, Lead Agency
WRIA 55 Planning Unit Members

From: Carl Einberger, LHG, Aspect Consulting, LLC
Dan Haller, PE, Aspect Consulting, LLC

Re: **Review of Existing Watershed Plan and Implementation
ESSB 6091/RCW 90.94 Watershed Plan Update**

Background

The passage of Engrossed Substitute Senate Bill (ESSB) 6091, as codified by RCW 90.94, requires that an update to the existing Watershed Plan for Water Resource Inventory Area (WRIA) 55, the Little Spokane Watershed, be approved by the Washington Department of Ecology (Ecology) by February 1, 2021. Spokane County Environmental Services is serving as the lead agency for this process. The WRIA 55 Initiating Governments for the watershed planning process are Spokane County, Stevens County, Pend Oreille County, the City of Spokane, and Whitworth Water District. The process is supported by convening the WRIA 55 Planning Unit to review technical tasks and memorandums, policy decisions, and the pending watershed plan update. Aspect Consulting, LLC (Aspect) has been contracted by Spokane County to facilitate planning unit meetings, conduct supporting technical tasks, and prepare the watershed plan update.

Section 202(2) of ESSB 6091 requires a review of the existing watershed plan for WRIA 55:

“the department shall work with the initiating governments and the planning units described in chapter 90.82 RCW to review existing watershed plans to identify the potential impacts of exempt well use, identify evidence-based conservation measures, and identify projects to improve watershed health”

Previous watershed planning in WRIA 55 was conducted in combination with WRIA 57 (Middle Spokane River). The Watershed Plan¹ for WRIAs 55/57 was adopted in 2006, and the Detailed Implementation Plan² (DIP) was approved in 2008 for WRIAs 55/57.

Ecology issued initial policy interpretations on ESSB 6091 in March 2018, including its interpretation that the requirement to review existing watershed plans is a procedural step to help inform the participants in the planning process in their endeavor to update the watershed plan as

¹ Prepared by the Little Spokane River and Middle Spokane River Planning Unit, Lead Agency: Spokane County
<http://spokanewatersheds.org/wria-55-57-watershed-plan>

² Prepared by the WRIA 55/57 Watershed Implementation Team
<http://spokanewatersheds.org/files/documents/WRIA-55-57-FINAL-DIP.pdf>

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directed under Section 202(4)(a). Ecology noted it does not interpret the new law to necessitate a comprehensive review of the entire watershed plan. As stated in Section 202(4)(a) the purpose of the review is to identify references to:

- The potential impacts of exempt well use;
- Evidence-based conservation measures; and
- Projects to improve watershed health.

This memorandum reviews elements of the Watershed Plan, DIP, and additional projects conducted under Ecology Watershed Implementation Grants that are relevant to informing the above three topics.

Potential Impacts of Exempt Well Use

ESSB 6091 requires consideration of a 20-year planning horizon for estimating future exempt well use and linking it to net ecological benefits [Section 202(4)(c)]. A review of the Watershed Plan and DIP has been conducted to identify references to the potential impacts of exempt well use.

Estimated Exempt Well Use

The Watershed Plan presented an estimate of exempt well use for all of WRIA 55 of 11,000 acre-foot/year (afy) total³. The estimate is based on 320 gallons per day per capita water use and a population of 30,700 not served by public water systems. Per capita exempt well use was estimated based on water system data from systems outside the City of Spokane, which was consistent with Department of Health, Spokane County, and City of Spokane guidance. The population outside of public water systems was obtained from 2000 census data. This total was not broken down by subbasin, and no future projections of exempt well use were presented in the Plan. Consumptive versus non-consumptive use for exempt wells was not evaluated.

As part of preparing the current watershed plan update, a detailed analysis is underway in WRIA 55 to estimate future exempt well demand to meet the ESSB 6091 requirement to evaluate future exempt well use on a 20-year planning horizon. This work will supersede the limited work projecting exempt well use conducted during the previous planning process. The exempt well demand estimate analysis is based, in part, on a previously developed Spokane County Demand Forecast Model, which included demand estimates for new single-family, self-supplied residences within WRIA 55 that were estimated in the 2015-2040 timeframe through updating this model. The Spokane County Demand Forecast Model was expanded to Stevens and Pend Oreille Counties during development of the Little Spokane Water Bank.

A separate technical memorandum will present the 20-year planning estimates of new exempt wells and associated consumptive demand within WRIA 55 specifically to address ESSB 6091 requirements.

Groundwater-Surface Water Modeling

As part of the Watershed Plan development, the WRIA 55 and 57 Watershed Planning Unit used a numerical model (MIKE SHE) to assess water availability in the Middle Spokane and Little Spokane basins. The MIKE SHE model simulated hydrologic cycle processes, include

³ See Table 2.I.H of the Watershed Plan

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evapotranspiration, overland flow, channel flow, unsaturated zone flow, saturated zone flow and snow pack. Model simulations included a 20-year growth projection scenario ending in 2020, but only looked at changes to municipal and domestic water use, wastewater discharge, and lawn irrigation for the year 2020. Changes were not made to water use for increases in exempt well use, with the model apparently incorporating only the existing total exempt water use of approximately 11,000 afy noted above.

The MIKE SHE modeling work conducted during the previous watershed planning process has now been superseded by more advanced and current modeling developed by a Spokane County consulting team (West Consultants and Earthfx), using GSFLOW, a coupled groundwater-surface water model. This work was conducted under a Bureau of Reclamation Drought Resiliency Grant, with a report issued in December 2018⁴. The modeling report includes a scenario that analyzed the incremental changes to the LSR watershed due to the increase in the permit exempt wells (single-family domestic supply) projected to occur over the next twenty years, including changes in groundwater levels and instream flows basin-wide. Spokane County staff used the County's Water Demand Model to predict where the demand would occur, and these values were incorporated into the model. The increase in demand was estimated to be on the order of 2,200 afy total, with the highest use during the summer months. This model will serve as a working tool for the current watershed planning process, including additional refinements of exempt well demand based on the updated estimates currently in progress. The model can also be used to evaluate the benefits of potential water offset projects.

Watershed Plan and DIP Recommendations on Exempt Wells

The Watershed Plan and DIP included several general recommendations to address the impacts of domestic exempt wells on overall water availability, including:

- Recommendation III.B.02: The Department of Ecology should enforce the minimum instream flow shutoff of water rights junior to WAC 173-555 on irrigation from exempt wells in the Little Spokane Watershed where it does not cause additional fire danger.
 - No action has been taken in this regard to date.
- Recommendation IV.A.01.b: The counties should implement a policy or procedure requiring a person who is developing property within a water service area to consult with the water purveyor about the potential for public water service before creating a development or single-family residence dependent on domestic exempt wells.
 - The Spokane County Coordinated Water System Plan encourages but does not require connections to public water service if feasible. As a matter of practice, this generally happens unless line extension costs are exorbitant.
- Recommendation IV.A.01.c: Request counties, cities, and/or the Regional Health Districts to evaluate the quantity of water necessary (currently 1 gallon per minute) from a domestic exempt well before issuing a building permit.
 - Spokane County convened a Water Availability Advisory Group. The group came up with recommendations for changes to the process currently used by Spokane

⁴ Integrated Groundwater/Surface Water Model for the Little Spokane Watershed – Water Bank Modeling and Decision Support Tool, Model Development and Application Report, December 2018

<http://spokanewatersheds.org/wria-55-57-current-projects>

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Regional Health District to establish the physical availability of water for building permits. No action has been taken on the recommendations to date.

- Recommendation IV.A.01.f: Land use regulators are encouraged to consider available ground water resources when establishing minimum parcel sizes in areas where exempt wells will be the main source of domestic water in an effort to avoid future water shortages.
 - In general, Spokane County’s Comprehensive Plan limits rural parcels to a minimum of 10 acres, with some exceptions that may be grandfathered prior to implementation of the Growth Management Act. Similar measures are in place in Stevens and Pend Oreille Counties.
- Recommendation IV.A.02.a: Evaluate policies that will limit the maximum daily withdrawals to less than 5000 gallons per day where detrimental impacts are identified
 - No action has been taken in this regard to date.
- Recommendation IV.A.03.a: At a minimum, when flows in the Little Spokane River are expected to fall below minimum instream flows, caution letters should be sent to all domestic exempt well owners in the Little Spokane Watershed asking them to voluntarily conserve water. Methods for saving water and directions to a website with more information will be included with the letter.
 - As part of implementing the Watershed Plan, The WRIA 55/57 Implementation Group prepared and sent a “Water Smart” mailer to rural residences reviewing water availability issues and encouraging conservation.

Evidence-Based Conservation Measures

ESSB 6091 requires that the Watershed Plan be reviewed to identify recommended evidence-based conservation measures. In the context of ESSB 6091, we interpret “evidence-based” to refer to comparing baseline data on water use or estimates of water use made using accepted practices prior to implementing conservation measures to data or estimates on water use following conservation project implementation. Data sources could include, for example: water use metering; estimates of consumptive use before and after modifications to lawn irrigation methods or conversion of high-water landscape to low-water landscape; or estimates of the benefit of placing a water right, or a portion of a water right available as the result of a conservation project, in trust to benefit instream flows using Ecology’s accepted approach outlined in Ecology Guidance 1210 (Determining Irrigation Efficiency and Consumptive Use).

The Watershed Plan and DIP included several recommendations focused on water conservation, reclamation, and reuse. Most of these were applicable specifically to public water systems. Recommendations with applicability to exempt wells include:

- Recommendation I.A.01.a: Determine indoor conservation issues (approaches) on which the public needs to be educated (i.e. habits, indoor low-flow devices such as showerheads, faucets, toilets and appliances).
 - Spokane County conducted a rebate program for installation of low-flow toilets for rural homes. This can be considered evidenced-based as proof of purchase was required for the rebate.

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- Recommendation I.A.01.c: City and county governments will develop and implement a regional education and awareness program to promote wise and efficient use of the water supply with voluntary participation by water suppliers.
 - Several public outreach methods were used as part of Plan implementation to encourage conservation, including running an ad in the Spokesman Review, holding an Outdoor Conservation Summit in 2008, specialty landscape class offerings by WSU Extension and the City of Spokane, and making an EPA greenscaping brochure available at the Spokane County permit center.
- Recommendation I.A.02.a: Determine the outdoor conservation issues (approaches) on which the public needs to be educated (i.e., soil development, plant root development, native/drought-resistant vegetation, xeriscaping).
 - See previous bullet on public outreach.
- Recommendation I.C.01.c: Evaluate development of cost-effective options for reclamation and reuse in small-scale and decentralized settings.
 - No action has been taken in this regard to date.

Projects to Improve Watershed Health

The Watershed Plan and DIP included several recommendations applicable to improving watershed health and relevant to addressing impacts from exempt wells under ESSB 6091. Watershed Plan and DIP recommendations included:

- Recommendation III.A.01.c: Studies should be conducted on the major tributaries to determine the extent of and areas where spawning occurs. When this information becomes available, flow studies on the tributaries should be conducted to determine flow needs for the tributaries.
 - No action has been taken in response to this recommendation to date.
- Recommendation III.A.01.d: Recommend a study on the Little Spokane River tributaries on optimizing habitat for the target species and linking the preferred flows on the tributaries to flows at the control points.
 - No action has been taken in response to this recommendation to date.
- Recommendation V.A.02.a: Encourage the use of the State Trust Water Rights Program to secure water rights for instream flow.
 - No action was taken on this from direct implementation of the Watershed Plan. During development of the Little Spokane Water Bank, two water rights in the Dragoon Creek subbasin were purchased by Spokane County and transferred to the State Trust Water Right Program to provide seeding for the bank. With the passage of ESSB 6091, the water bank has been inactive and the future use of the water rights held in trust has not been determined by Spokane County. At the present time, these water rights are benefiting instream flows. Spokane County has also applied for funding through Ecology's Watershed Improvement Grant Program to purchase additional water rights in WRIA 55 to benefit instream flows. This work

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would be completed specifically in support of the watershed plan update and to address “water-for-water” requirements of ESSB 6091.

- Recommendation VI.A.01.a: Support the restoration, where feasible, of wetlands in areas where these features existed historically but have been drained.
 - As part of an evaluation of water storage investigation discussed below, PBS&J⁵ identified a number of wetland restoration opportunities, with further study recommended.
- Recommendation VI.A.01.b: Encourage the creation of new wetlands, where feasible, in upland areas and along stream corridors.
 - No action has been taken in response to this recommendation to date.
- Recommendation VI.A.02.a: Continue site identification and feasibility analysis for use of surface runoff storage in **existing** lakes as means of augmenting baseflow in the Little Spokane Watershed.
 - As part of Watershed Plan implementation, studies of water storage in WRIA 55 were conducted as part of the Watershed Planning process. Golder Associates⁶ looked at a number of storage sites in WRIA 55, with the only options evaluated in detail being new dams at Buck Creek and Beaver Creek in the Beaver Creek subbasin. The report concluded that costs of project implementation were prohibitive, and no further work has been completed.

PBS&J⁵ conducted additional storage investigations focused on the West Branch of the Little Spokane River. This study evaluated use of existing dams, natural lakes, and new dams, and infiltration using existing lakes or depressions. PBS&J concluded that raising existing dams to increase storage is not feasible, primarily because sufficient storage would not be obtained. They also concluded that increasing storage in natural lakes, such as Eloika Lake, is limited by the extent of development along the lakes, and associated effects on existing residential properties.

- Recommendation VI.A.02.b: Continue site identification and feasibility analysis for use of surface runoff storage in **new** artificial lakes or ponds as means of augmenting baseflow in the Little Spokane Watershed.
 - No action has been taken in response to this recommendation to date.
- Recommendation VI.A.02.c: Continue site identification and feasibility analysis for use of recharge and storage in aquifers as means of augmenting baseflow in the Little Spokane Watershed.
 - Golder Associates⁶ conducted preliminary work to evaluate aquifers in WRIA 55 for potential for artificial recharge including flood sands and gravels and basalt

⁵ Surface Water Storage Investigation, West Branch Little Spokane River, Wetland Restoration and Recharge Opportunities, WRIA 55 & 57

<http://spokanewatersheds.org/files/documents/PBSJ-WBLSR-SW-Storage-Final-090424.pdf>

⁶ First Step Storage Assessment, Little and Middle Spokane Watersheds

<http://spokanewatersheds.org/files/documents/855c545a-303f-4852-a0f2-54895b4eb329.pdf>

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aquifers. They considered recharge to gravel pits as an option and recommended more detailed screen of their suitability for potential recharge sites.

Spokane County has a pending funding application through Ecology's Watershed Improvement Grant Program focused on design, construction and implementation of managed aquifer recharge (MAR). This work would be completed specifically in support of the watershed plan update and to address "water-for-water" requirements of ESSB 6091.

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