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Sent: Friday, June 30, 2017 11:35 AM
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Cc: Nick Peak <peak.nicholas@epa.gov>
Subject: EPA comments on the Nitrogen Availability Assessment

Hi Gary and Vern

Thank you for the opportunity to read and review the draft Yakima Nitrate Loading Assessment. As described in the introduction of the draft report, consistent with the provisions of the Interlocal Agreement that led to this study, EPA understands that the scope of this report is limited. As noted, the report presents modeled estimates of nitrogen availability throughout the GWMA, but does not calculate how much is transported to groundwater, since such estimations would require significant further analysis. The analyses in the report do not reflect site specific conditions, rather they are intended to reflect calculations of potentially available nitrogen within the overall study area. The report helps the state and county identify sources that would likely need additional focus and study to support any future fate and transport analyses and/or management decisions.

With those caveats in mind, EPA appreciates the significant level of effort that has gone into this report. We understand that the intent is for it to continue to develop as additional information and data become available and we support efforts to contribute to the further development of the science.

From our review, it was not clear from the report what type of Quality Assurance Project Plan (QAPP) WSDA/the county used in the development of the report. We encourage any future iterations to include a QAPP and suggest referring to those developed by the Department of Ecology and EPA as models. And, working to ensure a clear QAPP will serve to bolster the value of subsequent analyses conducted for any future fate and transport analyses or decisions.

The report references work completed under the Yakima Valley Dairies administrative order on consent (AOC) with EPA. Future report updates and additional work can benefit from using existing relevant data developed under the AOC in accordance with EPA-approved QAPPs. For example, the draft report does not appear to account for excess nitrogen in forms of nitrate and ammonia which were measured at excessive levels in the Yakima AOC Dairies' fields. Although the scope of the AOC is limited to particular dairy operations and not a random sampling, the data collected is publicly available and can be used either in calibrating future modeling efforts, and/or in adding to new data measurements or future data collection efforts. The 2013 Fall Soil Reports show excessive nitrate levels in many of the dairies' manured

application fields. Data are provided for the 1-foot, 2-foot and 3-foot soil depths. The lagoon assessment memoranda summarize the difficulty of finding available information regarding how the lagoons were constructed. The 90 percent Bosma and DeRuyter lagoon basis of design plans provide data regarding the permeability of soils at some of their lagoons (see Figure 3 and Appendix C in each plan). The data are posted on EPA's website at: <https://yosemite.epa.gov/R10/WATER.NSF/GWPU/lyakimagw>. To pull up the documents list on the FTP site, click on "Find copies and plans and reports developed under the Consent Order." Please let me know if you would like to discuss what data is available from EPA that is most relevant to this effort.

EPA encourages the authors to further study the results of the post-harvest deep soil sampling that has been occurring in the Yakima Valley and to evaluate nitrogen inputs by producers in the mass balance in the study. A key component of the mass balance is the accurate representation of the application of nitrogen by producers. For example, the results of the post-harvest deep soil sampling show a discrepancy between what particular producers stated that he/she land applied in the form of commercial fertilizer or manure, and what the actual post-harvest deep soil sampling results showed. In one example, a producer indicated that he/she applied 300 lbs/acre of nitrogen and raised 30 tons of silage corn, yet the results of his/her post-harvest deep soil tests still showed 370 lbs/acre of nitrogen remaining in the top foot of soil. Incorporating this information into future analysis can help identify areas where excess nitrogen loading is occurring and could help the state/the county identify specific areas of focus for reducing nitrogen loading.

The conclusion of the report indicates that soil organic matter mineralization is a critical information gap. EPA agrees that there is good opportunity to better understand this topic through additional research. The University of Idaho has completed research that shows how the mineralization of nitrogen and changes in soil organic matter over time can be a significant source of nitrogen in the soil, and that these sources of nitrogen are not typically accounted for in the nutrient management planning or budgeting process. We support future efforts to further understand how these process affect the amount of nitrogen in soil in Yakima Valley and encourage the county/WSDA to look at some of research from the University of Idaho and USDA's Agriculture Research Service in Kimberly, Idaho.

Thank you again for the opportunity to provide input, and if you would like to discuss any of this ideas further, please let me or Nick Peak know. Nick is the R10 Agriculture Advisor and my alternate on the GWAC.

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