STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

2110 Ironwood Parkway, Coeur d'Alene, ID 83814
(208) 769-1422

Brad Little, Governor
Jess Byrne, Director

October 7, 2021

Drew Dittman
Lake City Engineering
126 E. Poplar Ave.
Coeur d'Alene, ID 83814

Dear Mr. Dittman:

The Idaho Department of Environmental Quality (DEQ) received a document completed by Inland Earth Sciences regarding the Bayshore Estates Development located in Post Falls, Idaho titled "Level 2 Nutrient Pathogen Evaluation, Bayshore Estates Subdivision" dated September 3, 2021. The report was reviewed and DEQ has the following comments and questions;

1. Please provide the following additional aquifer test information:
   1.1 May 11, 2021 step test
      - Time-drawdown and recovery data in electronic format
      - Time and measured pump rates in electronic format

   1.2 May 12, 2021 constant rate aquifer test
      - Time-drawdown and recovery data for the pump and observation wells in electronic format
      - Time and measured pump rates for the pump well in electronic format

   1.3 Distance in feet from the pump well to the two observation wells
   1.4 Residual drawdown graph with t/t' and s' on the axis and best fit line

2. Would suggest that any analysis and reporting of aquifer test results should be in accordance with DEQ's "Guidance for New Water Testing Procedures for Public Drinking Water Systems" December 2007.

3. The early time drawdown data (approximately 16:26:00 to 17:38:00) of the May 12th constant rate test, prior to any interference from the Greensferry Water System wells, appears to indicate a flattening of the drawdown curve with an increasing trend in water levels. What would cause this response? How does this affect the calculated transmissivity value?

4. The analysis of the recovery data using both the time-recovery graph method and the equation approximation method assumes Theis conditions. The entire recovery test was affected by withdrawal from the pump well and the Greensferry Water System well(s) and appears to violate the singular pump well and constant pump rate assumptions. Please provide a description of the application of the two methods and the effects on the calculated transmissivity caused by any deviation from the underlying assumptions. In particular how the drawdown caused by the Greensferry well(s) and was accounted for, any corrective analysis that was performed and any impact to the calculated transmissivity.

5. What was the calculated transmissivity determined from the pump well of the May 11th step rate test and the May 12th constant rate test? Please provide any supporting calculations and graphics.

6. The hydraulic conductivity used in the model of 200 feet per day would generally represent a well sorted sand or sand and gravel. Is this representative of the screened portions of the observations wells?

7. Would suggest that any construction, analysis and reporting for the ground water flow model should be in general accordance with ASTM D5718, ASTM D5490, ASTM D5609 and ASTM D5610.

8. Provide the following additional model information:
   - Modflow 2005 and MT3DMS input and output files in electronic format
   - Flow and contaminant mass balance errors
   - Velocity vectors for plan and cross sectional view for last time step of the steady state model
   - Plan and vertical view of ground water contour maps before and after introduction of drainfield effluent. The contours interval should be of sufficient resolution to show any potential changes in the water surface elevation.

9. It appears that the upgradient and downgradient constant head model boundaries are located adjacent to the development boundaries. Any hydraulic stresses to the system and contaminant plumes should not reach artificial model boundaries. Boundaries should be located far beyond any potential singular or cumulative influence of the drain fields.

10. A general head boundary defining the lower gradient boundary might be more appropriate so the ground water elevation and flow are not fixed and can better reflect any stresses to the system.

11. The horizontal and vertical model discretization should be based on (1) reducing or eliminating numerical dispersion usually referencing a Peclet number standard and (2) obtaining sufficient plume(s) resolution to accurately determine ground water concentrations relative to the spatial distribution of drainfields and boundaries. Please provide justification for the model discretization referencing the criteria of above and how changes in spacing affect the model results.

Please let us know if you have any questions or would like to discuss this further. Thank you.

Sincerely

Gary Stevens

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