PUBLIC HEALTH DIVISION
Drinking Water Services
Kate Brown, Governor

Oregon Health Authority

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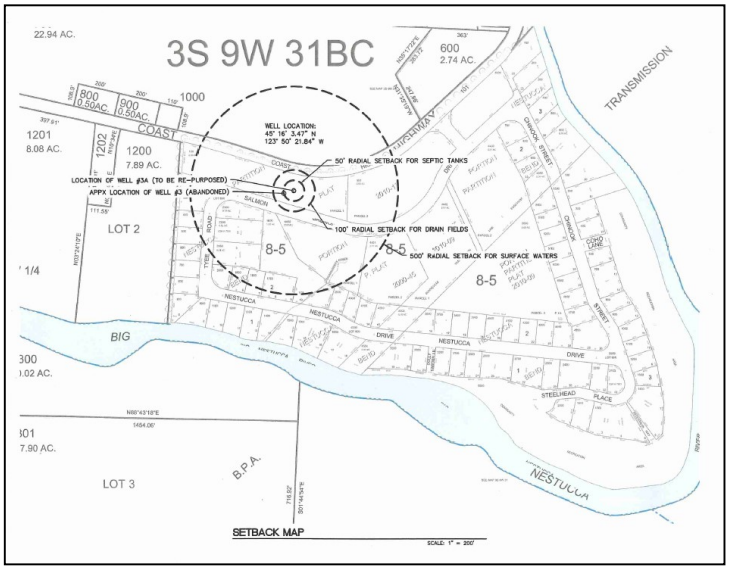
December 12, 2019

Rob Henry, PE and Andrew Bates, EIT
HBH Consulting Engineers, Inc.
501 E First Street
Newberg, OR 97132

Re: **Beaver Water District (PWS #00199) – Well #3A (TILL822) Certification Conditional Approval (PR #157-2019)**



Dear Mr. Bates and Mr. Henry:

Thank you for your submittal to the Oregon Health Authority's Drinking Water Services (DWS) of plan review information for the certification of Well #3A on behalf of the Beaver Water District. The plans and Land Use Compatibility statement were received on 10/18/19 and the $825 review fee payment was received on 11/13/19.

The project seeks approval to use an existing well (constructed 5/16/79) in Beaver, OR as a supplemental source for the Beaver Water District. The submitted plans include a new well house, sodium hypochlorite, soda ash, and greensand filtration system. The new well is to be recognized as SRC-BA Well #3a2 – TILL822 under a new entry point - Entry Point B (EP-B). The "2" after Well #3a accounts for only the second of two 8" steel casings placed in the 3-ft diameter concrete ring that is to be used (two casings were originally approved by Oregon Water Resources Dept. under a Special Construction standard).

The proposed project is granted "Conditional Approval" and will only be granted "Final Approval" when the conditions listed on page 2 of this letter have been met (this letter does not constitute approval for use or approval on behalf of any other county or state agency). Also, please note the well evaluation results from our geologist, Tom Pattee, on pages 3 & 4 of this letter, which results in monthly raw water source assessment coliform sampling required to be completed for 1 year.

Conditions for Approval:

In order to be issued "Final Approval", the following conditions will need to be met:

1) Evidence of the applicable Conditional Use and building approvals from Tillamook County are obtained and submitted as referenced in the 10/18/19 letter from Tillamook County written by Hilary Foote (503-842-3408 x 3314);
2) Evidence of the applicable water rights required (or not required) by the Water Resources Department is obtained and submitted;
3) Raw, untreated, well test results for SOC, VOC, IOC, Uranium, Radium 226/228, Gross Alpha, and coliform bacteria (presence/absence test) are submitted. Subsequent monitoring requirements are summarized in Table 1 below.
4) A registered professional engineer provides written documentation that facilities were constructed in accordance with the submitted plans, these conditions, and construction and disinfection standards under OAR 333-061-0050 (a letter with a checklist for HBH Consulting Engineers, Inc. to complete will be sent for this).

Table 1 – Initial monitoring					
Year 1				Year 2	Year 3
Sampling to be completed prior to Final Approval	Sample by the end of the first quarter of operation (after Final Approval)	2nd Quarter of Operation	3rd Quarter of operation		
Sample at the Source Prior to Treatment (SRC-BA)	Sample at the Entry Point (EP-B) to the distribution system served by the new source (after treatment)				
• Coliform • Nitrate, Nitrite • IOC, VOC, SOC • Arsenic • Radiological including uranium, gross alpha, and radium 226/228	• Radiological • Lead and copper tap samples	• Radiological if initial sampling has radiological detections	• Radiological if initial sampling has radiological detections	Annual: • Nitrate • VOC • SOC	
Sampling at Customer Taps	Tap Sampling in the Distribution System (to assess impact of the new well on distribution system corrosion).				
• Lead and Copper*	• Sample at 20 Tier 1 sites (1st 6-months of operation)		• Sample at 20 Tier 1 sites (second 6 months of operation)	Reduction to 10 tap samples every 3 years is possible depending upon results	
Source Assessment (raw water coliform)	Monthly raw water source assessment sampling for coliform bacteria (Although properly constructed per OWRD Special Construction standards, the well is in a highly susceptible shallow unconfined aquifer)			Annual Source Assessment sampling	
*Changes in water quality due to the addition of a new source may impact the corrosivity of the water, therefore, two 6-month demonstration rounds of lead and copper tap samples at an increased number of 20 Tier 1 sample sites are needed to verify that the well does not adversely contribute to lead and copper corrosion. Water quality parameters for pH and alkalinity will not be required provided the lead and/or copper action levels are not exceeded (the system has not exceeded any action levels in the past)					

Comments from OHA-DWS geologist Tom Pattee:

As Built Well Construction Evaluation for Plan Review and/or Setback Waiver:

☒ Well/Spring meets current construction standards.
  ☒ WRD special construction standards, see well log or Comments.
☐ Well/Spring construction does not meet construction standards.
  ☐ Not sealed to appropriate depth. Recommended depth: _____
  ☐ Not appropriate seal materials
  ☐ Open to more than one aquifer
  ☐ Seal info missing or unknown
  ☐ Seal not constructed properly (☐ Insufficient sealant volume ☐ Insufficient annular space)
☐ Susceptible construction, but grandfathered source. Consider for reconstruction if nitrate ≥ 5mg/L or confirmed *E. coli* at source.
☐ Susceptible well construction, **not approved for use**.

Comments: See WRD special construction standards for this well. As per the well log and special construction standard, this is a large diameter well (36-inch diameter) with a total depth of 42.5 ft that had two smaller diameter casings set within the well. The large diameter well was then backfilled with gravel around the smaller diameter casings from the bottom of the hole to a depth of 20.5 ft below ground level. A concrete casing seal extends from the surface to the top of the gravel pack at 20.5 ft below ground. The bottom 4.5 ft of the casing seal forms a seal with the silt that overlies the aquifer that the well draws water from. The issuance of a WRD special construction standard at the time of construction indicates that the well meets the intent of the construction standards. However, as a precaution, OHA Sensitivity Analysis results suggest that the construction of the well should be considered highly sensitive to local land use practices at this time.

Nature of Aquifer Evaluation:

Aquifer Nature: ☐ Confined aquifer ☐ Semi-confined aquifer ☒ Unconfined aquifer

Comments: This well draws water from a shallow unconfined sand and gravel aquifer that is overlain by 20 ft of silt (clay). OHA Sensitivity Analysis results suggest that the aquifer is highly sensitive to local land use practices. Therefore, due to the presence of fecal contaminant sources near the well (septic systems), if water from this well is to be disinfected before entering the distribution system, the well should be placed on monthly source assessment monitoring for one year beginning in the month when the well starts delivering water into the distribution system.

Construction Setback Waiver Info:

☒ Hydrogeologist review for likely spills/releases with respect to identified potential setback violation:
- ☒ Not applicable, spills/releases are not tracked for this type of contaminant source.
- ☐ No spills/releases identified with respect to the sanitary setback violation.
- ☐ Spill/release identified that is related to the sanitary setback violation.

Hydrogeologist Comments: US Hwy 101 and Salmon Dr appear to be within 100 ft of the well. OHA Sensitivity Analysis results suggest that the aquifer is highly sensitive to local land use practices. Heavy use roadways, such as Hwy 101 are considered to be a moderate risk to groundwater quality due to increased risk of large spills that may occur as the result of commercial transport vehicles and highway speed limits. Roadways that are not heavily used, such as Salmon Dr, represent a low risk to groundwater quality due to lower speed limits. OHA Susceptibility Analysis results suggest that water quality at the well is highly susceptible to contamination from large spills that may occur along Hwy 101 and has a low susceptibility to transportation along Salmon Dr. Given Hwy 101 is at or very near the 100-ft sanitary setback boundary, it may be reasonable to consider whether or not enforcement of the 100 ft setback, with respect to the highway, would result in reduced risk of contamination of the water supply and whether or not the intent of the setback has been met. With that in mind, water quality susceptibility to Hwy 101 is the same if located barely inside the setback or barely outside the setback. So, it appears that drinking water supply is not susceptible to Salmon Dr and that the intent of the setback requirement may have been met for Hwy 101.

Oregon Dept. of Environmental Quality (DEQ) may need to be contacted regarding residuals disposal from the greensand filtration system - contact Tim Ruby at DEQ at 503-229-5292 for more information. For water rights, contact Nikki Hendricks at Oregon Water Resources Dept. at 503-815-1967. Documentation and test results for the above-mentioned items should reference Plan Review #157-2019 and can be e-mailed to me at evan.e.hofeld@state.or.us or mailed to:

Attn: Evan Hofeld
OHA-Oregon Drinking Water Program
PO BOX 14450
Portland, OR 97293-0450

If you have any questions, please feel free to call me at 971-673-0419.

Sincerely,

Evan Hofeld, PE
Oregon Health Authority – Drinking Water Services

cc: Troy Trute, Beaver Water District
Annette Pampush, Tillamook County Environmental Health
Hilary Foote, Tillamook County Dept of Community Development
Nikki Hendricks, Oregon Water Resources Department
Tim Ruby, Oregon Department of Environmental Quality

Project Description:

The well has two 8" casings spaced about 9" apart placed from +6' to 42' all within a 36" concrete ring that has been filled with cement. The casings are denoted as Well #3a1 and Well #3a2, however, only well casing #3a2 will be fitted with a Grundfos Model #35S50-19 VFD submersible pump and used. The wellhouse contains the well, four 13" x 54" greensand filter tanks, a Stenner 30-gallon sodium hypochlorite tank for residual maintenance, a Stenner 30-gallon soda ash tank, two Stenner 45M1 chemical feed pumps, and related controls & appurtenances located at T3S, R9W, Sec 31 Tax Lot 100 (Tax Lot 100 is owned by the Beaver Water District).