NorthWest Colorado Consultants, Inc.
Geotechnical / Environmental Engineering • Materials Testing

October 31 2022

Empire West Holdings, LLC
c/o Darin Heiter
P.O. Box 6022
Frisco, CO 80443

Job Number: 09-8295

Subject: On-Site Wastewater Treatment System Observations, Heiter Residence, 29550 County Road 14D, Routt County, Colorado.

David,

As requested, NWCC, Inc. (NWCC) visited the project site from July 6, 2022 to August 12, 2022 to observe the On-site Wastewater Treatment System (OWTS) being installed for the Heiter Residence under construction at 29550 County Road 14D in Routt County, Colorado. NWCC previously designed the OWTS under this job number, dated December 6, 2021.

Site Observations: At the time of our site visit on July 6, 2022, the installer, Anson Excavating and Pipe (AEP), had placed a 1,500 gallon, two compartment concrete septic tank approximately 80 feet to the west of the residence under construction. The inlet and outlet 'T' connections to the septic tank visually appeared to be properly constructed and an effluent filter had been placed in the outlet 'T' connection in the second chamber. The piping (ASTM 3034: SDR35) from the residence to the inlet of the septic tank had been placed and appeared to meet the minimum grade requirements.

We also observed the excavation of two profile pits in the proposed soil treatment area (STA) located to the southeast and uphill of the STA site previously investigated. The subsurface conditions encountered in these two pits were similar to those previously observed, and consisted at least 3 feet of sandy to silty loam that classified as Soil Type 2A, which is the soil type used in the design of the OWTS.

At the time of our visit on July 12, 2022, AEP had installed fifty six (56) Quick-4 Standard chambers in four runs for the STA. Each run had 14 chambers and the chambers had been installed level in the upper 12 inches of natural topsoil and organic materials. Galvanized mesh had been installed under and up the sides of the chambers. The installer had also placed inspection pipes at the inlet and terminal end of each run of chambers.

AEP had installed the distribution box approximately 35 feet to the west of and downhill of the septic tank and the 4-inch piping (ASTM 3034: SDR35) from the septic tank to the distribution box and to each run of chambers. The piping appeared to meet the minimum grade requirements. We advised AEP that the piping

must be bedded prior to backfilling. Flow levelers had been installed in each of the outlet pipes in the distribution box.

We also advised AEP they should backfill the piping, tank and chambers in accordance with the manufacturer's recommendations. We also advised them that a minimum of 18 inches and a maximum of 36 inches of soil cover should be placed over the tops and sides of the chambers. If sufficient amounts of fill are not placed over the chambers, seepage may occur during high usage periods. We also recommended a minimum of 24 inches of soil cover over the distribution lines, after the piping was properly bedded and a minimum of 12 inches of soil cover over the septic tank. The disturbed areas should be heavily seeded with a drought tolerant grass.

At the time of our site visit on August 12, 2022, AEP had completed backfilling the OWTS. Risers had been installed on the septic tank access and the lids were accessible above the finished ground surface. A riser had also been installed on the distribution box. It appeared that sufficient cover had been placed over the piping, septic tank and chambers.

An as-built drawing taken from field measurements of the system is presented in Figure #1.

Based on our part time observations, it appears that the portions of the system, which were completed at the time of our site visits, had been constructed in general accordance with the design previously completed by our firm. We believe that the system should function properly with proper care and maintenance, as outlined below. If extended periods of inactivity occur at the residence, the Infiltrator chambers must be periodically flooded with water, every 30 days, to prevent rodents from nesting and burrowing in the chambers, which could result in another premature failure of the system.

Operation and Maintenance: Observing the operation and performing routine maintenance of the OWTS is essential for proper, long term functioning of the system. NWCC recommends the operation be periodically monitored and a qualified, licensed maintenance contractor perform system maintenance.

1. *Septic Tank*: The scum and sludge accumulation in the septic tank should be monitored yearly. Once the scum or sludge thickness reaches 25% of the chamber depth, the septic tank should be pumped. A pumping frequency of 1 to 3 years is likely at the design flows. Depending on use, pumping may only be required every 3 to 5 years.
2. *Effluent Filter*: The effluent filter at the septic tank outlet should be cleaned when the septic tank is inspected or as required.
3. *Soil Treatment Area*: The soil treatment area should be fenced off to vehicular traffic and livestock. The surface area around the soil treatment area should be observed monthly for signs of failure, such as lush vegetation growth or ponding. Liquid levels in the chambers should be observed through the inspection pipes.
4. *Treated Water*: NWCC does not recommend water softeners or water treatment systems be allowed to discharge to the OWTS. The chemical and hydraulic loading from the backwash of these treatment systems can be detrimental to the OWTS. If a treatment system is used, a separate

dry well should be constructed for the backwash waste. In addition, chemically treated water from a swimming pool or spa must not be discharged into the OWTS.

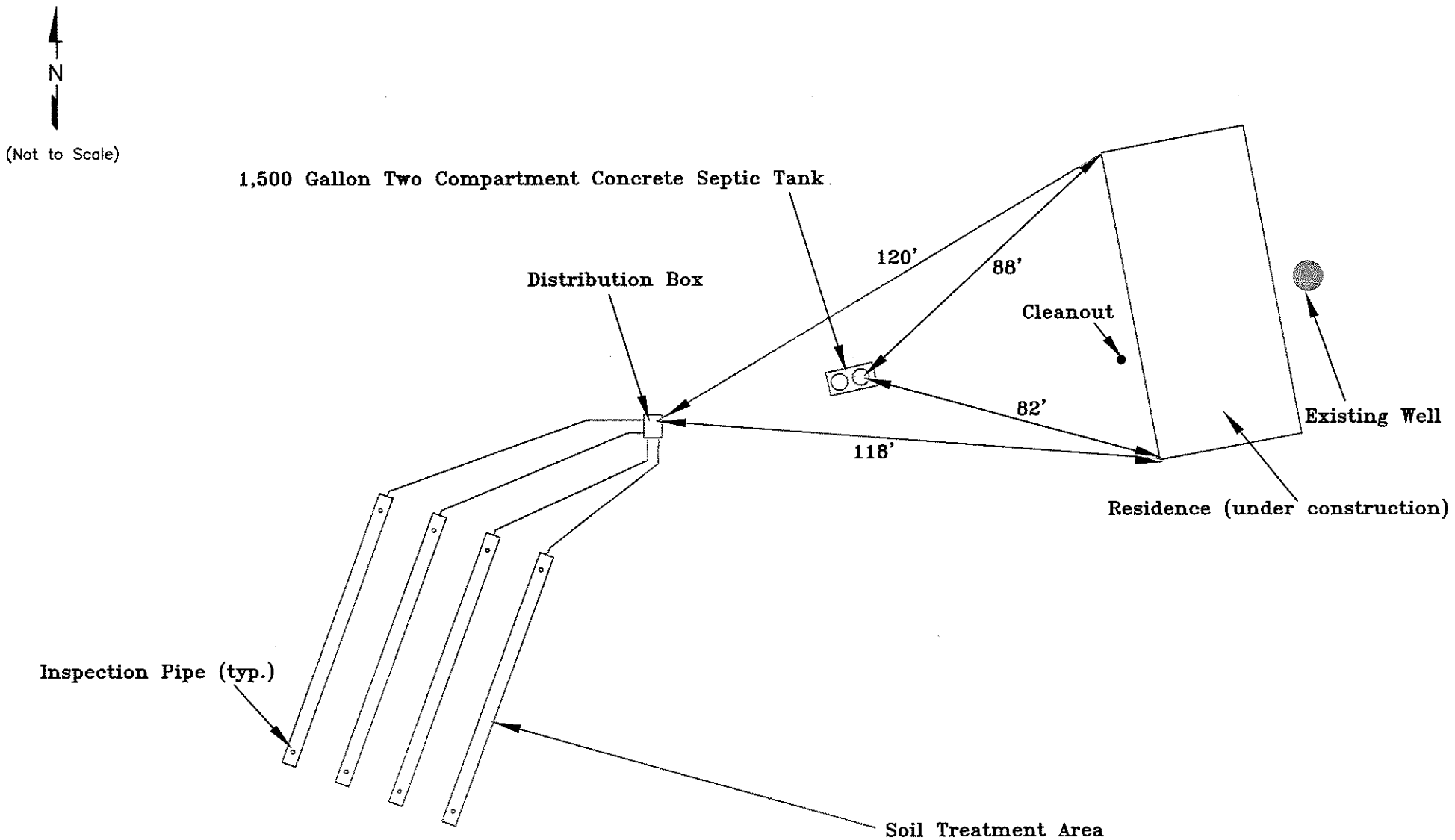
5. *General Notes*: The owner should be aware that the operation of the OWTS is different from a public sewer service. Plastic and other non-biodegradable materials should not be placed into the system. Water use should be monitored so fixtures are not allowed to run if a seal malfunctions. Allowing fixtures to flow continuously to prevent water lines from freezing or a malfunctioning faucet or toilet can consume in excess of 1,000 gallons per day. Excessive flows could flood and cause premature failure of the system. No plastic or landscaping that requires additional irrigation should be placed over the soil treatment area.

If you have any questions regarding this report, our observations or recommendations or if we may be of further service, please contact this office.

Sincerely,
NWCC, Inc.,

Brian D. Len, P.E.
Principal Engineer

cc: Routt County Department of Environmental Health



Title: OWTS – ASBUILT SITE PLAN		Date: 10/31/2022
Job Name: Proposed Heiter Residence		Job No. 09-8295
LOCATION: 29550 County Road 14D, Routt County, Colorado		Figure #2

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