



November 27, 2023

Ted Kerr
612 Ogden Lane
San Antonio, TX 78209

Job Number: 21-12082

Subject: On-Site Wastewater Treatment System
Observations, Kerr Residence, Lot 11, Sidney
Peak Ranch Subdivision, Routt County,
Colorado.

Ted,

As requested, NWCC, Inc. (NWCC) visited the project site on April 29, May 5 and October 11, 2022 and June 5 and 9 and November 17, 2023 to observe the On-site Wastewater Treatment System (OWTS) being installed for the Kerr Residence under construction within Lot 11 of the Sidney Peak Ranch Subdivision in Routt County, Colorado. NWCC previously designed the OWTS under this job number, dated March 25, 202.

Site Observations: At the time of our site visit on April 29, 2022, NWCC visited the site at the request of the architect to determine if a different location for the proposed Soil Treatment Area (STA) could be utilized at the site. The architect was concerned about the distance between the house and the STA. On May 5, 2022, we met with the excavation contractor and general contractor to discuss alternate locations for the STA. It appeared that adequate flow could be achieved without pumping if the STA was constructed to the west of the proposed residence. We advised the excavation contractor and general contractor that additional profile pits must be excavated in the area of the new STA location to verify the soil conditions were similar to those used in the design of the OWTS.

At the time of our site visit on October 11, 2022, the installer, Nordic Excavating, had placed a 2,000 gallon - three compartment concrete septic tank approximately 15 feet to the west of the residence, which was under construction. The installer had also placed the 4-inch solid sewer piping (ASTM 3034: SDR35) from the residence to the inlet of the septic tank. The 4-inch solid piping appeared to meet the minimum grade requirement. A cleanout was installed where the piping exited the residence. The inlet and outlet 'T' connections in the first and second compartments of the septic tank visually appeared to be properly constructed. An effluent filter had been placed in the outlet 'T' connection in the second chamber.

At the time of our site visit on June 5, 2023, the installer had placed the 4-inch solid sewer piping (ASTM 3034: SDR35) from the dosing siphon (FD 417) in the 3rd compartment of the septic tank to a distribution box near the Soil Treatment Area (STA), located approximately 70 west of the residence. The installer had also placed the 4-inch piping (ASTM 3034: SDR 35) from the distribution box to each run of chambers.

The piping appeared to meet the minimum grade requirements. Flow levelers had been installed in each of the outlet pipes in the distribution box.

The installer had completed four runs of Quick-4 Standard Infiltrator chambers. The installer had placed 3 runs of 16 chambers and one run of 15 chambers for a total of 63 Quick-4 Standard Infiltrator chambers. Each run of chambers had been installed level in the upper 2 to 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.

We advised the installer that two profile pits must be excavated in the area of the STA in order to verify the soil conditions were similar to those encountered north of the residence where the STA was originally designed. At the time of our site visit on June 9, 2023, two profile pits had been excavated near the southwest corner and northeast corner of the STA. The soil conditions encountered in the profile pits consisted of 36 to 42 inches of topsoil and organic materials overlying natural clays to the maximum depth investigated, 6 feet below the existing ground surface.

We advised the installer that the new location of the STA was acceptable and 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 November 17, 2023, the installer had completed backfilling the OWTS. Risers had been installed on the septic tank access and the lids were accessible above the finished ground surface. 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 with the noted exceptions. 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 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

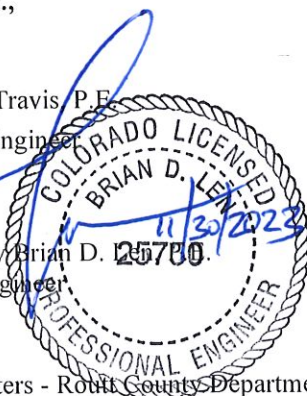
- pumped. A pumping frequency of 1 to 3 years is likely at the design flows. Depending on use, pumping may only be required every 3 to 5 years.
2. Effluent Filter: The effluent filter at the septic tank outlet should be cleaned when the septic tank is inspected or as required.
 3. Soil Treatment Area: 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.

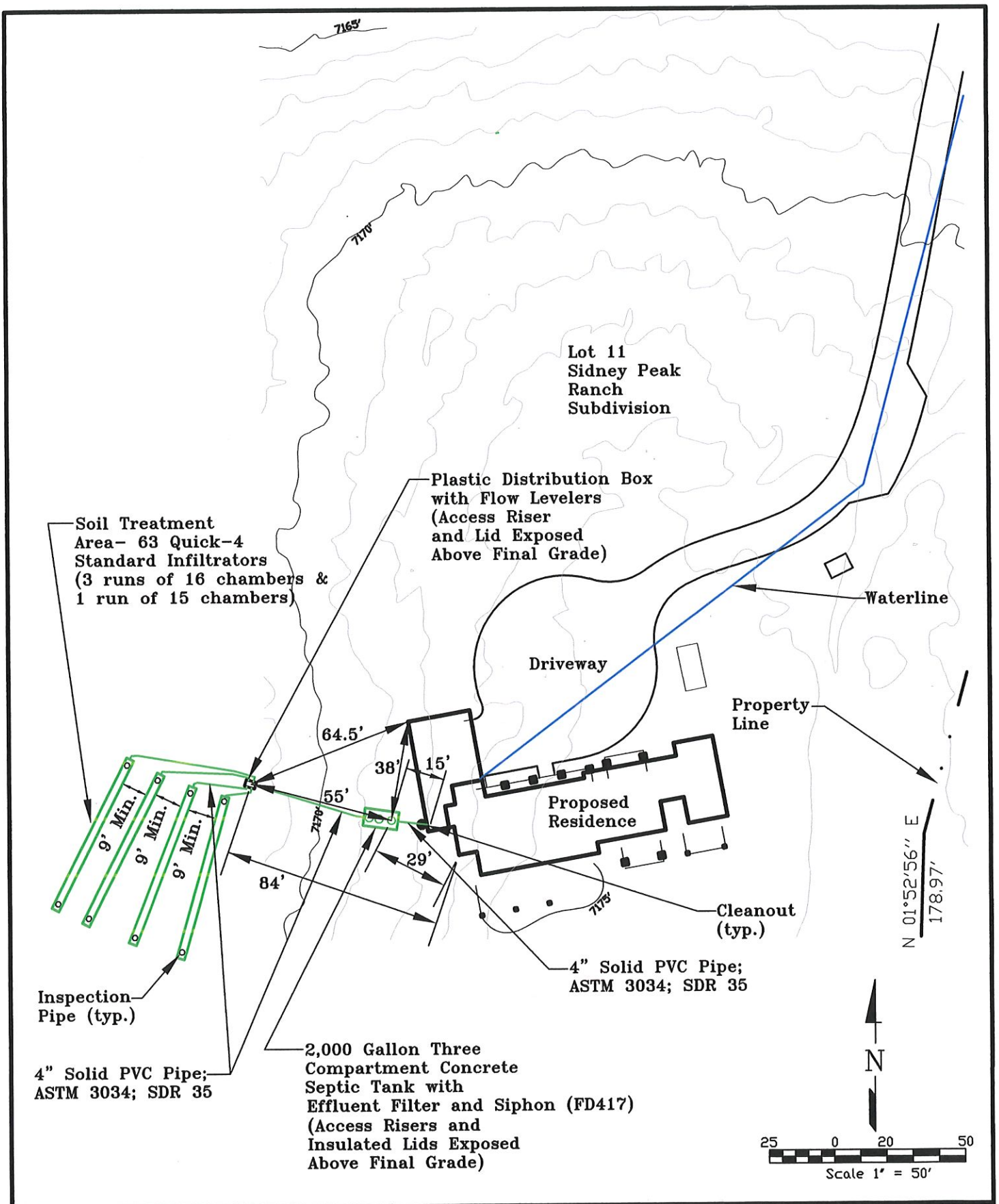
Sincerely,
NWCC, INC.,

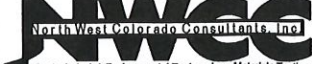
Timothy S. Travis, P.E.
Sr. Project Engineer

Reviewed by Brian D. 25780
Principal Engineer



cc: Chris Peters - Routt County Department of Environmental Health



Title: OWTS - AS BUILT SITE PLAN	Date: 11/21/2023	 <p>NWCC North West Colorado Consultants, Inc. Geotechnical / Environmental Engineering - Materials Testing (970) 879-7888 - Fax (970) 879-7891 2580 Copper Ridge Drive Steamboat Springs, Colorado 80487</p>
Job Name: Kerr Residence	Job No. 21-12082	
Location: Lot 11, Sidney Peak Ranch, Routt County, Colorado	Figure #1	