



October 21, 2022

Nathan Nicholas
1701 Constellation Drive
Colorado Springs, CO 80905

Job Number: 20-11970

Subject: On-Site Wastewater Treatment System
Observations, Nicholas Residence, 50310 Moon Hill
Drive, Routt County, Colorado.

Nathan,

As requested, NWCC, Inc. (NWCC) visited the project site on December 14 and 21, 2021 and October 21, 2022 to observe the construction of the On-site Wastewater Treatment System (OWTS) for the Nicholas Residence under construction at 50310 Moon Hill Drive in Routt County, Colorado. NWCC previously provided an OWTS design report for the residence under this job number and dated June 9, 2021.

At the time of our site visit on December 14, 2021, the installer, Sand Creek Enterprises, had placed the sand fill materials and approximately 6 inches of washed gravels for the treatment area. The sand fill materials were placed to a minimum of 24 inches above the existing ground surface. The gravel bed distribution area appeared to have been constructed to the proper dimensions, approximately 12 feet by 47 feet. The mound base area also appeared to be constructed to the proper dimensions, 16 feet by 51 feet. The mounded sand filter treatment area is located approximately 50 feet northeast of the residence and 150 feet east of the well.

The installer had also placed the 1 ½-inch diameter perforated pipe (5/32" @ 48" c.c.) in the washed rock. The installer had also constructed the flow control valves in each of the perforated laterals near the manifold and cleanout/monitor ports and the end of each perforated lateral. We advised the installer that the perforated piping could be covered with gravels, after the orifice shields were placed.

At the time of our site visit on December 21, 2020, the installer had placed a 1,250-gallon (3-compartment) concrete septic/dosing tank to the north of the residence, which is currently under construction. The 4-inch diameter piping from the residence to the septic tank had also been constructed at the time of our site visit. The piping appeared to meet the minimum grade requirements. The inlet and outlet 'T' connections in the first and second compartments of the septic tank visually appeared to be properly constructed at the time of our site visit. An Orenco PF5005 pump and pump vault with an effluent filter had been installed in the third compartment of the septic tank. The 2-inch diameter (Schedule 40) piping had been placed from the pump to the 1.5" diameter distribution manifold at the sand filter gravel bed. We were advised that the wiring to the control panel and alarm had not been completed at the time of our site visit. A generator was used to turn the pump on and test the flow to the distribution pipes. Based on our observations, the pump

system and perforated piping were functioning properly with a minimum 5 feet spray height across the SFTA. We advised the contractor that the piping could be backfilled after placement of the oriface shields and remaining gravels.

We advised the contractor that a minimum of 18 inches of soil cover should be placed over the sand filter system after the washed rock and barrier material had been placed, a minimum of 12 inches of soil cover should be placed over the septic and dosing tanks and a minimum of 24 inches of soil cover should be placed over the solid piping, when completed. The disturbed areas must be re-seeded. The risers on the septic/dosing tank must be raised to the finished ground surface

At the time of our site visit on October 21, 2022, the installer had connected the pump to the control panel and OWTS had been backfilled. It appeared that sufficient cover had been placed over the piping, tanks and mounded sand filter. The insulated lids for the septic and dosing tanks were accessible at the finished ground surface. Inspection pipes had been constructed at each corner of the mounded sand filter. The covers for the flow control valves and cleanout/monitor ports had also been installed. 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 and observed 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 the components backfilled or not completed at the time of our visits were properly constructed.

Operation and Maintenance: Observing the operation and performing routine maintenance of the OWTS is essential to allow proper, long term functioning of the system. We recommend that the operation be periodically monitored and a qualified, licensed maintenance contractor perform maintenance of the system.

- 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 and Pumping System: The effluent filter in the Biotube pump vault should be cleaned when the septic tank is inspected or as required. The effluent pump should be checked semi-annually to ensure the pump is functioning properly. If the high water alarm sounds, the pumps and floats should be inspected and serviced immediately. A backup pump is recommended to be stored on-site to allow for timely replacement.
- 3) Sand Filter Treatment Area: We recommend that the sand filter field be fenced off to vehicular traffic and livestock. The surface area around the field should be observed monthly for signs of

failure, such as lush vegetation growth or ponding. Liquid levels in the treatment area should be observed through the inspection pipes.

- 4) Treated Water: We do not recommend that the water softeners or water treatment systems be connected to the OWTS. The chemical and hydraulic loading from the backwash of these treatment systems may 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.
Senior Project Engineer



Reviewed by Brian D. Len, P.E.
Principal Engineer

N88° 22' 07"W

732.64'

Well

Property
Line

4" Solid PVC
Pipe; ASTM 3034;
SDR 35

Future
Garage

Residence
Under
Construction

Gravel
Driveway

1,250 Gallon Three
Compartment Concrete
Tank with Orenco Biotube
Pump Vault, 24" Effluent
Filter and Orenco PF5005
Effluent Pump.
(Access Risers and Insulated
Lids Exposed Above Final Grade)

Mounded
Sand Filter
12' x 47' Gravel
Distribution Bed
16' x 51' Basal
Area

Flow
Control
Valves

Cleanout
(typ.)

Inspection
Pipe (typ.)

Distribution
Manifold - 1.5"
Solid PVC Sch. 40

2" Solid PVC Pipe;
Schedule 40-Graded
to drain to Manifold
or back to dosing tank.

Cleanout

Ditch/
Swale

N

0 10 20 30
Scale 1" = 30'

Title:

OWTS - AS BUILT PLAN

Job Name:

Proposed Nicholas Residence

LOCATION:

50310 Moon Hill Drive, Routt County, Colorado

Date:

10/21/2022

Job No.

20-11970

Figure

#1

NWCE
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