



12/2/2022

Seth Roderick, PE
Monteverde Engineering & Design Studio
250 E Elizabeth St, Suite 114
Harrisonburg, VA 22802

Jarrell Properties, Inc.
c/o James Jarrell IV
1005 Sophia St
Fredericksburg, VA 22401

RE: Clift Farm Development – Utility Impact Analysis

Mr. Jarrell,

Per your request, this letter provides an overall summary of prior discussions held with Stafford County staff (including former Engineering & Construction Manager, Aref Etemadi) in regard to planned capacity and anticipated impact to the existing Hickory Ridge sanitary sewer pump station associated with the proposed Clift Farm project. Analysis was based upon existing pump station data collected by County staff, an assumed Clift Farm max density of 150 units (in excess of the proposed 141 units), and a projected growth scenario within the Hickory Ridge pump station service area consistent with current long-range County plans.

County staff first analyzed the impact of the proposed Clift Farm development in March of 2020. An email correspondence forwarded by Aref Etemadi based its analysis on two scenarios: (1) existing conditions plus full build-out of Clift Farm ("Current Scenario"), and (2) existing conditions plus full build-out of Clift Farm and **additional regional growth** ("Future Scenario").

In evaluation of the Current Scenario, County staff determined that, "the added peak flow of 58.34 gallons per minute (GPM) from this site to the present hydraulic model does not result in any issues in the gravity sewer," and confirmed that q/Q does not exceed 30% in the Current Scenario. Further, Staff confirmed that "peak flows simulated to Hickory Ridge pump station remain below the current design point of 230 GPM (199 GPM vs 230 GPM)". In conclusion, it was determined that development of Clift Farm could occur immediately without creating any capacity issues.

In evaluation of the Future Scenario, County staff similarly determined that, "loading the additional peak flow of 58.34 GPM to the future hydraulic model based on the projected growth scenario and replacing the previously used buildout flows of 36.96 peak GPM associated with

the subject parcels, does not result in any issues in the gravity sewer.” Staff additionally confirmed that q/Q does not exceed 80% in the Future Scenario analysis. However, Staff determined that, “peak flow simulated to Hickory Ridge pump station in this scenario is 465 GPM, which is above the current design point of the station, as expected. (Master Plan project) LFR-215 considers an expansion of the station by 213 GPM...however, in consideration of uncertainties regarding demand estimates, which should be conservatively high, we felt that LFR-215 design will need to be (re)visited in future master plan updates to determine the expected growth and size of the facility.”

In relation to servicing of additional growth within the region, it should be noted that the proposed Clift Farm pump station’s position and elevation support potential service to more than just the project’s own parcels. As depicted on the attached *Clift Farm Sanitary Sewer Serviceable Area Map*, another 63± acres with frontage on Clift Farm Road could potentially tie into the proposed pump station via gravity lines (depending on final grading of the adjacent parcels, etc.). This acreage includes significant developable portions of the County-owned parcel, TM 46-62, including area designated as a potential new school site.

In sum, the proposed rezoning to allow for up to 141 residential units (analyzed at 150 units) does not show any indication of exceeding the current pump station design flows, nor alter future considerations as it relates to ultimate development of and service to the region. As such, former Engineering & Construction Manager, Aref Etemadi, notified the project applicant that, “I can confidently state that...the project (as presented) can proceed.”

It is my hope that this memorandum adequately describes the impact of the proposed development on the existing pressure sanitary system, and the correspondence and efforts that have occurred thus far with County staff to ensure feasibility. Should you have any questions to this regard, please contact me at your convenience.

Sincerely,



Seth Roderick, PE

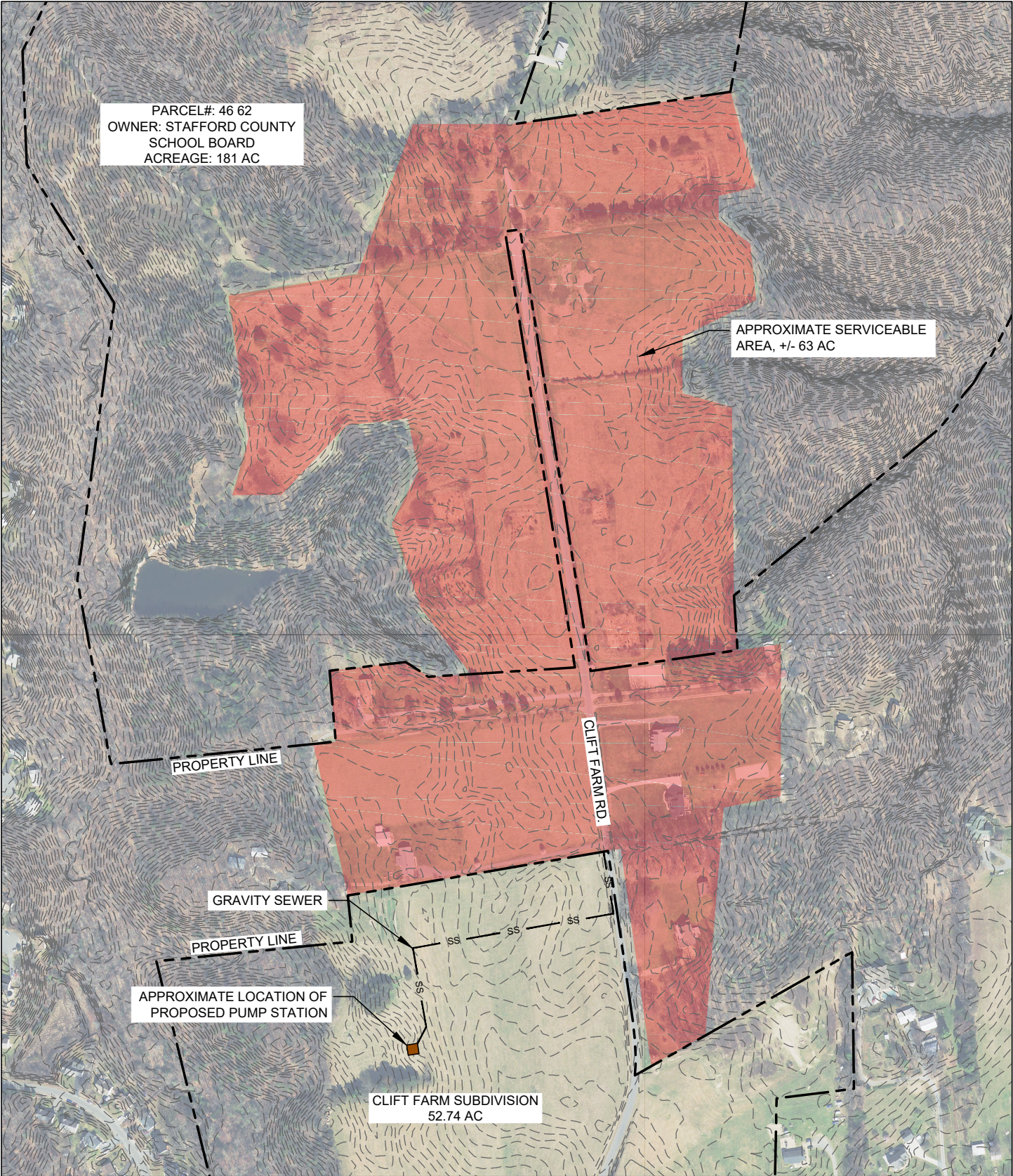
Managing Partner

Monteverde Engineering & Design Studio



CLIFT FARM

SANITARY SEWER SERVICEABLE AREA MAP



APPROXIMATE SERVICEABLE
AREA, +/- 63 AC

