

Emery& Garrett
GROUNDWATER INVESTIGATIONS
A Division of GZA

GEOTECHNICAL
ENVIRONMENTAL
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WATER
CONSTRUCTION MANAGEMENT

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Mr. C. Ryan Connor, P.E.
Principal
Urban, Ltd.
7712 Little River Turnpike
Annandale, VA 22003

RE: EGGI's response to Middleburg Planning Board Commission Hearing (dated July 27, 2020) Middleburg Land I Subdivision (Banbury Cross Reserve) PIN's 503464523, 502281672, 502398957

Dear Ryan,

This letter serves to follow up on the Public Hearing that was held by the Middleburg Planning Board Commission on Monday night July 27, 2020. I applaud the Commission for wading through the many varied comments and concerns. I have attended more than one hundred of these type of hearings over the past 3 decades in Loudoun County and other localities in northern Virginia. It is not uncommon for people to express concerns about water issues for any project. However, I have never attended a meeting such as this when the Hydrogeologic consultant who has conducted the groundwater investigation was not invited to speak to address many of the misleading claims that people attending were making. In light of this, I think it is important for the Commissioners to know more about who we are and to reiterate some of the results of the testing of 11 on-site wells conducted as part of the Hydrostudy.

Emery & Garrett Groundwater Investigations (EGGI) – EGGI have performed more than 2,000 groundwater studies in Northern Virginia and along the eastern United States. We are licensed professional hydrogeologists by the State of Virginia to do this work as required by Loudoun County. We have directly worked throughout Loudoun County for the past 30+ years.

Specific to Loudoun County we have been retained by every Town and community in the County to conduct groundwater development, testing, or management investigations except for Middleburg. This has included being contracted by Hillsboro, Round Hill, Purcellville, Lovettsville, and Hamilton. Just last week the Town of Hillsboro celebrated, with great fanfare, the water supply we developed for them that solved a 100-year water supply problem for which they had been under a boil water order for the past 20+ years. In all studies we must, and have, demonstrated that the Town's new wells will not adversely impact offsite wells before being approved for use.

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In addition, EGGI has performed all of the groundwater development, testing, and management studies for the residential Communities in Loudoun County that are served by Loudoun Water. This includes the subdivisions known as Beacon Hill, Rokeby Manor, Elysian Heights, Lenah Farms, Creighton Farms, and Selma. The only system we did not develop the water system for was Raspberry Falls, but we were subsequently brought in to fix a problem that was the result of "other' consultants. We have also successfully performed substantial groundwater investigations for Loudoun County Public Schools, Loudoun County Parks, and more than 100 groundwater investigations for subdivisions and other groundwater users throughout Loudoun County. In all cases, before any approvals by the County were given, we have had to adequately demonstrate that sufficient water had been developed without causing offsite impacts.

Lastly I want to mention that we have worked (and are currently working) under contract with Fauquier County, Fauquier County Water and Sanitation Authority (and have been for the past 20+ years), the Town of Culpeper and Culpeper County, Prince William County and the Prince William County Water Authority and have performed, or are performing groundwater investigations for nearly 30 other Virginia counties. Our track record has been consistent, successful, and defensible. This is why we are sought after by local governments and private entities.

People have the full right to testify and EGGI fully supports this, but when folks testify with false or misleading information who have no groundwater expertise...it is honestly a bit disheartening. Furthermore, I have never in my 40 year career heard a non-licensed geologist opine in public on a groundwater investigation who had never performed any groundwater investigations in the local area or to my knowledge have a track record of groundwater experience in Loudoun County (and who would not be qualified to do hydrostudies in Loudoun County in accordance with the Loudoun County FSM regulations). It is professionally inappropriate in my view.

With this said, let me offer several important points that I believe the Commissioners should hear.

1) ***Water supply being used on site-*** The net groundwater withdrawal from this proposed subdivision is only 4 gpm (5,700 gallons per day). This was developed on a parcel of land that is 570 acres in size. Compare this to the Town of Middleburg's 5 production wells that produce a range of 45 gpm to 120 gpm that if pumped 24 hours could produce 64,800 to 172,800 gpd wells. This data is provided by the Middleburg Source Water Protection Plan (December 2018). Some of these Town wells are located on small lots of less than one acre. The Town has little to no ability to protect their own water supply with such little land control. Contrary to this, the proposed subdivision is located in a pristine environment and will/can protect their water supply. They should be applauded for this type of preservation as this is what we as groundwater scientists want to see. The amount of water that this subdivision is using is so minor that there is literally no possible means that such a small amount of water used on site could cause adverse impacts to the Town wells or other off-site impacts as demonstrated by our report.

2) ***Available groundwater recharge to the site-*** The amount of available groundwater recharge to any project site also serves to determine long-term sustainable yield available to a well, wellfield, local aquifer, or subdivision using wells. Available groundwater recharge also influences the potential for off-site impacts to occur from on-site withdrawals. In other words, if insufficient recharge is available to support the groundwater withdrawals, then off-site impacts are more likely to occur. On the contrary, if

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more than sufficient groundwater recharge is available on site then it would be very unlikely for long-term adverse off-site impacts to occur. EGGI did an investigation of the available recharge at the project site and found that during average rainfall years that available recharge to the local groundwater system greatly exceeded (more than 35 times) the amount of recharge needed to sustain the groundwater supply. During drier/drought years when recharge/rainfall is less, there was still far more recharge available (more than 20 times) than that which is needed to sustain the proposed cumulative groundwater withdrawals posed by the subdivision.

3) ***Yield of wells drilled on site-*** There was a lot of misinformation spread in the hearing about the yield of the wells drilled on site. It is important to set the record straight on this. Eleven wells were drilled in the subdivision for the purposes of testing the potential water supply yield of the property, three of these wells yielded 60 gallons per minute (gpm) which is a higher yield than some of the Town of Middleburg's production wells. The average yield of the eleven wells was 30 gpm. The County requires that 1 gpm be developed per residential connection, even though the net groundwater withdrawal (due to the use of on-site drain fields) will be substantially less. This site is blessed with an abundance of water...not the contrary that many folks stated or inferred. It is one of the best sites relative to groundwater availability we have had the pleasure to work on.

4) ***Groundwater testing on site-*** Each of the 11 proposed residential wells drilled on site was pumped continuously for 8 hours and then monitored for recovery. It is rare that any residential well would ever actually be pumped for 8 continuous hours, but this acts as a stress test. All 11 wells exceeded the required yield minimum of 1.0 gpm; 10 of the 11 residential test wells were pumped at higher rates (4.5-11.7 gpm) than the 4 gpm (the net cumulative subdivision groundwater removal rate). The pumping of the wells illustrated that no adverse interference drawdown conditions occurred in the pumping well. During these tests a combination of two existing wells on site for every well tested were also monitored as part of this Hydrostudy. The drawdown measured in each monitoring well ranged from not impacted (0 feet of drawdown) up to 12.05 feet. These are insignificant amounts of drawdown for drilled bedrock wells that range in depth from 260 to 600 feet deep. Given that no adverse impacts occurred to ***on-site*** wells during the testing programs performed during this Hydrostudy at rates that ***exceed*** the proposed cumulative withdrawal rate for the entire subdivision, there is no evidence to suggest that adverse off-site impacts would, or could, occur as a result of the proposed limited use of on-site sources of groundwater.

5) ***Hydrostudy reviews and approvals-*** This Hydrostudy was prepared and submitted to Loudoun County Department of Building & Development and the Loudoun County Health Department in February of 2019. The study was approved by both Loudoun County agencies after being critically reviewed by a licensed outside hydrogeological consulting firm. It had been determined that groundwater withdrawals anticipated to be withdrawn from on-site wells were sufficiently limited such that further assessment of off-site impacts beyond what was done in the study was not material or meaningful. However, in response to the inquires made by the Town's consultant we provided additional support material that resulted in providing further evidence for the conclusions made in the original report. These were subsequently reviewed by the Town's expert consultants and it was concluded in their 7/24/20 e-mail to the Town that "*We do not believe that you should have any concerns that the new subdivision will adversely impact the Town's* wells"

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EGGI has been doing this type of work successfully for a very long time. There are no hydrostudies that have been performed and approved by Loudoun County in the past 30 years that have led to any on-site failure of developed water supplies or have caused adverse off-site impacts to groundwater users (per conversations with Loudoun County officials). The favorability of this site for providing a sustainable and secure water supply is exceptional. I have no reservation in stating that the availability of water on this site is not a concern now or will be in the future or that the use of the wells to meet residential water supply needs will cause any adverse off site water supply impacts . This is one of the best sites we have worked on relative to available groundwater recharge and groundwater resources.

Sincerely,

EMERY & GARRETT GROUNDWATER INVESTIGATIONS, A DIVISION OF GZA

James M. Emery, PG
Principal/District Office Manager
Senior Hydrogeologist



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