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June 21, 2021

Ms. Annalisa Peace
Executive Director
Greater Edwards Aquifer Alliance
Via email: annalisa@aquiferalliance.org



Subject: Comments on SAWS Sewage Options for Specht Tract

Dear Ms. Peace,

This letter transmits my comments on the proposed SAWS options to provide sewage services to the Specht Tract. My comments are based on a slide deck presented by Andrea L.H. Beymer, P.E. to the San Antonio Water System (SAWS) board dated June 8, 2021. I have also reviewed the information presented in a slide deck presented by Tracy B. Lehmann, P.E. to the Conservation Advisory Board in March 2021, and the Specht Tract Risk Assessment slide deck by Tracey B. Lehmann, P.E. and dated May 24, 2021.

The Specht Tract lies within the SAWS areas of Certificates of Convenience and Necessity (CCN) for both water and sewage. The tract also overlies the Edwards Aquifer Recharge Zone, as mapped by the TCEQ.

The gravity sewer line option would be constructed almost entirely within the recharge zone. See Figure 1. This option would also cross four observed or inferred faults, which are often zone of enhanced recharge. See Figure 2. About 2,400 feet of the route closely parallels one of these faults. Most of the gravity sewer line would be constructed within the 100-year floodplain. See Figure 3.

Additional information and opinions regarding each of these options are presented in the sections below.

Option 1: WW Treatment Plant within SAWS CCN

- A Texas Land Application Permit (TLAP), combined with biological nutrient reduction and tertiary treatment, is one of the most effective wastewater

Lift Stations

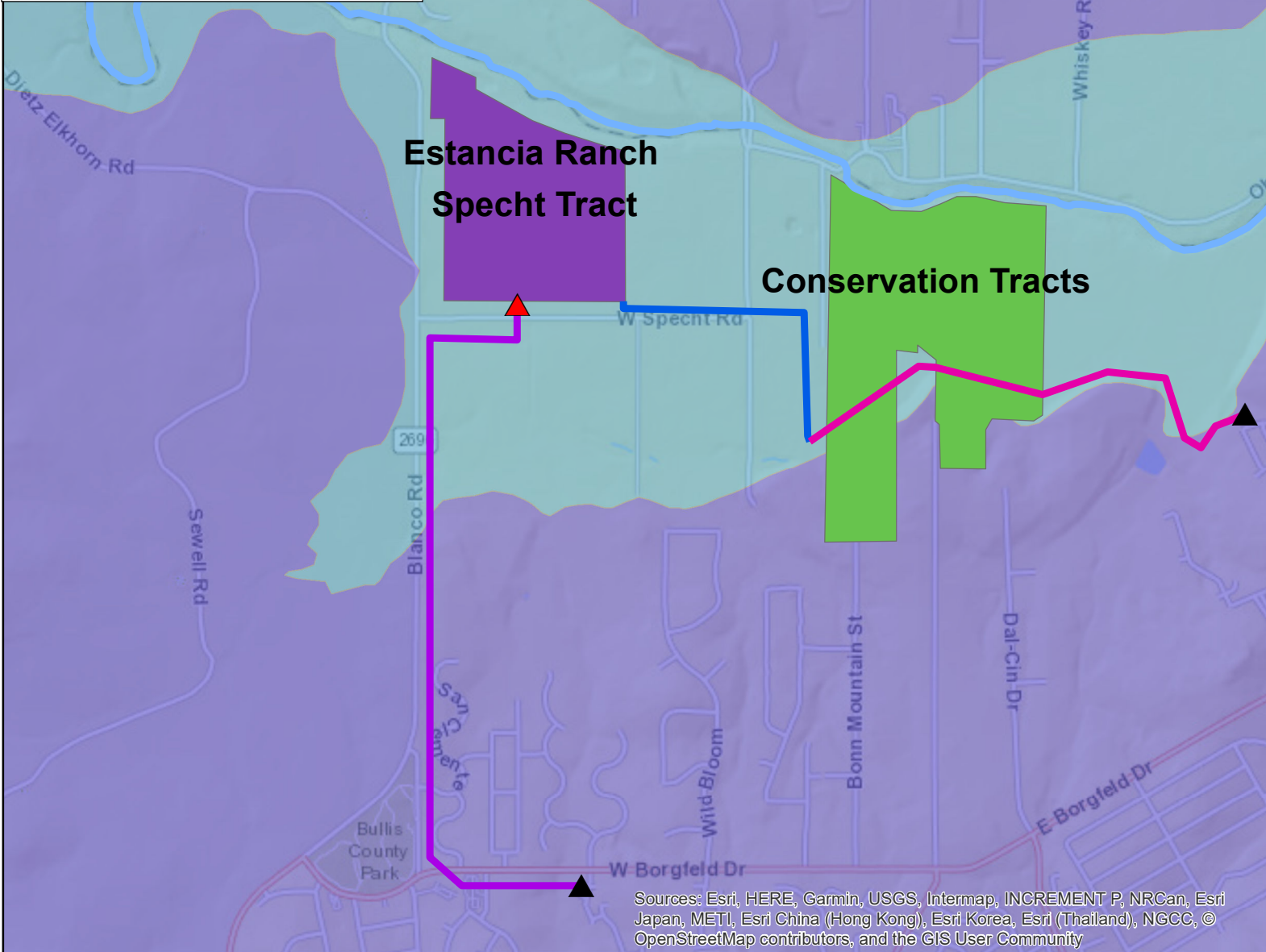
- ▲ Existing
- ▲ Proposed

- Option 3, Gravity Main
- Option 3, Oversized gravity Main
- Option 4, Force Main

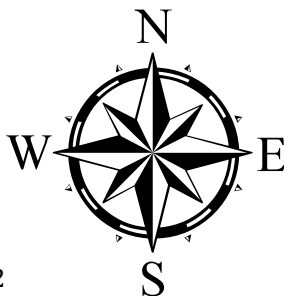
Edwards Aquifer Zone

- Edwards Aquifer Contributing Zone
- Edwards Aquifer Recharge Zone

Locations of Specht tract, conservation tracts, sewer line routes and lift stations are approximate, based on Proposed Infrastructure (Current), slide 7, San Antonio Water System, March 24, 2021. TCEQ Edwards Zones based on GIS data provided by the TCEQ.



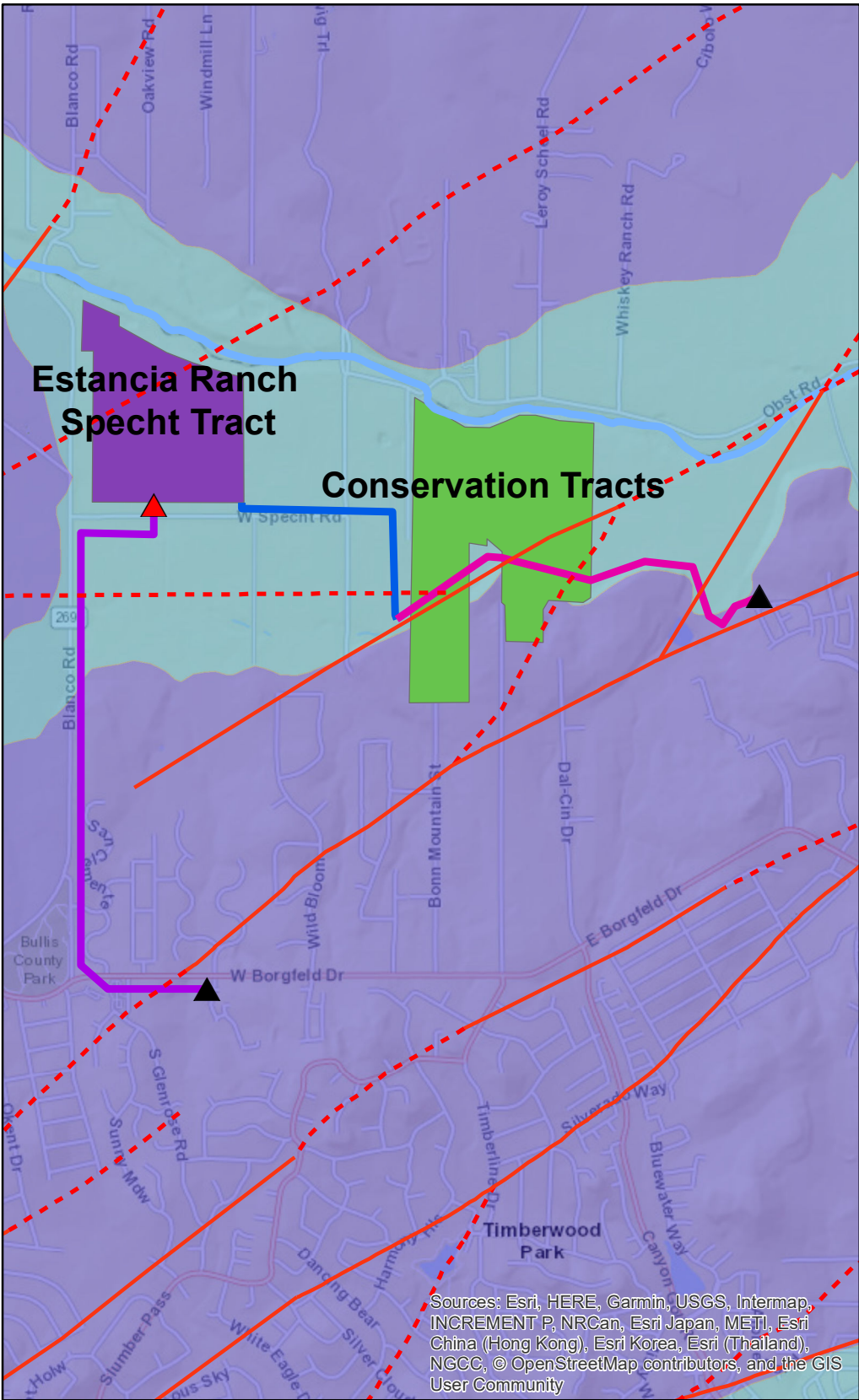
Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, © OpenStreetMap contributors, and the GIS User Community



0 0.25 0.5 1 Miles

Figure 1
Proposed SAWS Sewer to Serve Specht Tracts
TCEQ Edwards Zones

Locations of Specht tract, conservation tracts, sewer line routes and lift stations are approximate, based on Proposed Infrastructure (Current), slide 7, San Antonio Water System, March 24, 2021. Geology based GIS data provided by the U.S. Geologic Survey.



Lift Stations

▲ Existing

▲ Proposed

— Option 3. Gravity Main

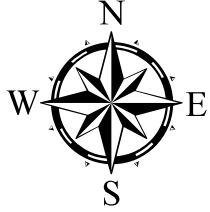
— Option 3, Oversized Gravity Main

— Option 4, Force Main

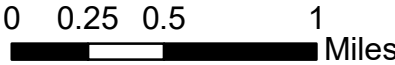
Edwards Aquifer Zone

— Edwards Aquifer Contributing Zone

— Edwards Aquifer Recharge Zone



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TBPE Firm No. F4092

Figure 2
Proposed SAWS Sewer to Serve Specht Tracts
Geology

June 21, 2021

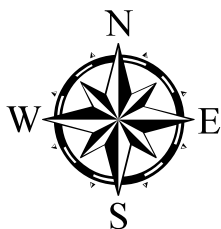
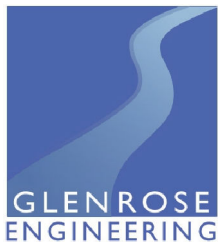
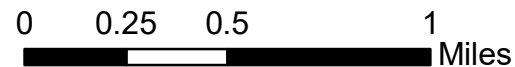
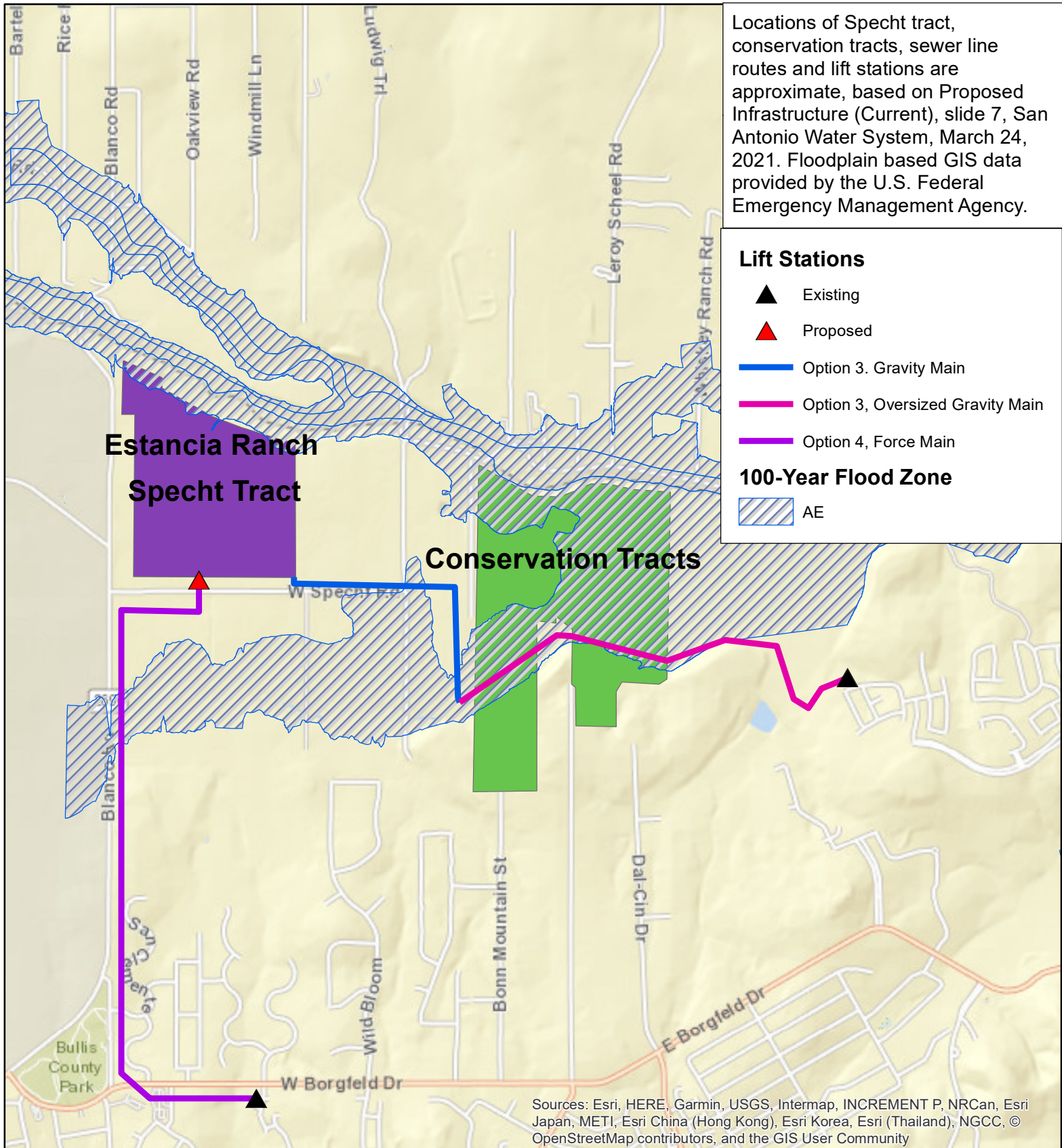


Figure 3
Proposed SAWS Sewer to Serve Specht Tracts
100-Year Floodplain

management options to protect water quality. Properly operated, it results in the lowest discharge loads of nutrients and toxic chemicals into streams.

- Most TLAPs, however, are ineffectively operated. Pipes break. Insufficient storage is provided. Effluent is irrigated when soil and plant uptake capacity is exhausted. Effluent and its associated nutrients and possibly other contaminants move overland and subsurface to flow into streams and groundwater. Nutrient concentrations and/or algae increases downstream.
- Option 1 would result in a TLAP over the Edwards Aquifer Recharge Zone. Because land-applied effluent over the recharge could percolate directly into the aquifer, there are no existing TLAP systems over the Edwards Aquifer Recharge Zone. Such a system for this development would establish a precedent for sewage effluent irrigation over the recharge zone which does not currently exist.
- SAWS operation of a TLAP system for this development could be subject to public oversight and transparency, which could provide additional reliability.
- SAWS lists the need for uninterruptible power as a concern for this option. Uninterruptible power would be required, however, to reliably operate any of the wastewater options.
- Option 1 could possibly reduce the area of development by the size of the area required for sewage effluent land application. At least some of required sewage application area, however, could be provided between the area proposed for house lots and the 100-year floodplain.

Option 2: WW Treatment Plant with CCN Decertification

- This option is similar to Option 1, except that the system would be designed, constructed, owned, and operated by the subdivision. Operation by a smaller entity might provide less day-to-day operational oversight and less reliability.
- Note that this estimated capital cost is \$7.5 million, compared to \$9 million for Option 1. The material I reviewed provided no reason for this estimated cost

difference. Presumably the required infrastructure for both Options 1 and 2 would be similar.

- As for Option 1, Option 2 could possibly reduce the area of development by the size of the area required for sewage effluent land application. At least some of required sewage application area, however, could be provided between the area proposed for house lots and the 100-year floodplain.

Option 3: Oversized Gravity Sewer Main

- Both Options 3 and 4 would result in sewage effluent discharge downstream from the Edwards Aquifer Recharge Zone. Sewage effluent discharge downstream from the Edwards Aquifer is the preferred alternative to sewage effluent land application on the recharge zone. This option has been consistently implemented across the Edwards Aquifer. The City of Austin has routinely exercised this option where it is feasible. The Travis Country Neighborhood on Barton Creek in Travis Country, for example, was built mostly in the mid-1970s on Barton Creek. Sewage from the neighborhood was originally treated in a package treatment plant and land applied for disposal. In the 1990s, because of high-nutrient spring discharges below the neighborhood into Barton Creek, the City of Austin constructed a sewer line to route the sewage to a City treatment facility downstream from the Barton Springs Edwards Aquifer Recharge Zone.
- Option 3 would require wastewater line construction through existing conservation easements. It would require crossing sensitive geologic formations and four known or inferred faults. Most of the pipeline would be constructed within the 100-year floodplain.
- Contours indicate that surface elevations at the beginning and end of this route are 1120 feet mean sea level. Either a deep receiving sewer at the outlet or a lift station would be required for gravity conveyance across this flat grade.

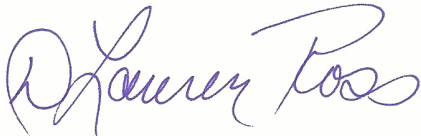
*Ms. Annalisa Peace, ED
Greater Edwards Aquifer Alliance, Inc.
June 21, 2021
page 4 of 4*

Option 4: New Lift Stations/Force Main

- The primary environmental risk associated with Option 4 is pump failure leading to a spill. A spill along this route would not, however, threaten water quality to the same extent as a leak from Option 3. This route is located mostly across the Edwards Aquifer Contributing Zone rather than the Recharge Zone. It crosses only about 950 feet of the 100-year floodplain. It crosses only two faults and one of these faults is located outside of the Edwards aquifer recharge zone.

I hope this information is helpful to your community as you deliberate the best wastewater options for the proposed development. Let me know if anything I've written isn't clear or if you have any questions.

Sincerely,



Lauren Ross, Ph. D., P. E.
President
Glenrose Engineering, Inc.