CITY OF WIMBERLEY
WASTEWATER PROJECT
FREQUENTLY ASKED QUESTIONS

1. What improvements are planned for Wimberley Wastewater Treatment Plant?

The City of Wimberley is proposing to increase the capacity of its current two-customer, 15,000 gallon per day ("GPD") wastewater treatment plant, located at the Blue Hole Regional Park, to provide wastewater service to approximately 170 properties in central Wimberley. Along with the installation of a collection system, plans call for initially increasing the plant capacity to 75,000 GPD, and ultimately to 100,000 GPD, to meet projected service demands for the next twenty (20) years. The expanded plant will relocated to a remote site on the northeast side of the Park. The plant will utilize a tertiary treatment process that will produce a higher quality effluent (Type I) than is currently being produced (Type II). The effluent will be reused to spray irrigate the soccer fields and other recreation areas of the Park and possibly returned to central Wimberley for reuse. In times when irrigation cannot occur, and on-site effluent storage capacity is full, the effluent would be discharged into Deer Creek, which empties into the Blanco River. Currently, the treatment plant uses subsurface irrigation for effluent disposal. Public access to the disposal area is currently prohibited due to the low quality of effluent being produced. It will take approximately seven (7) months to complete the design of the wastewater project and another year and a half to bid the project and complete the construction. The preliminary estimated cost of the wastewater project is $5.5 million. The City has applied for a low interest loan from the Texas Water Development Board to fund the project. To repay the loan, the City intends to issue System Revenue Bonds, with a pledge of utility revenues from users of the wastewater system along with revenues from the sale of effluent to the City and others for beneficial reuse. Wastewater service is projected to be available in the summer of 2016.

2. Why does the City need to provide wastewater service to central Wimberley?

The City of Wimberley continues to face an existing nuisance and environmental hazard caused by failing septic systems in central Wimberley. The area containing the failing systems is bounded on both sides by the Blanco River and Cypress Creek and sits atop the Trinity Aquifer. Existing development densities, established prior to the City's incorporation, prohibit replacement of many failed septic systems due to inadequate open space for sufficient drain fields. No evidence exists of permits having been issued for many of the septic systems in the subject area. Improperly covered septic fields exist on several properties and approximately eighteen (18) businesses in the area are having their septic systems "pumped" and "hauled" on a regular basis due to the inadequacy of their

systems. With the karst topography in the area of central Wimberley, there is a growing concern that some septic systems in the area are actually failing "down". Evidence of this concern can be found in the results of water quality tests on the Cypress Creek in central Wimberley that show elevated E. coli levels on a regular basis. In addition to addressing the existing environmental concerns, the proposed expansion of the wastewater system will foster responsible future development in central Wimberley.

3. **Why not simply expand the current use of subsurface irrigation for effluent disposal with the proposed wastewater system?**

Expanding the current use of subsurface irrigation for effluent disposal is cost prohibitive, considering the limited number of customers to be served by the proposed wastewater system. Extensive soil layers are required for subsurface irrigation. Importing the nearly 35,000 cubic yards of soil needed for such an operation would cost an estimated $1 million.

4. **What are the City's plans for the effluent that will be produced by the proposed wastewater treatment system?**

The City sees the highly treated effluent that will be produced by the proposed wastewater treatment system as a valuable resource. It intends to reuse the effluent to spray irrigate the soccer fields and other areas of the Regional Park along with possible reuse in central Wimberley. During mildly wet periods, the City will store effluent in a 500,000 gallon closed storage tank so that it can be used at a later time. Stream discharge of effluent would likely only occur during very wet conditions where irrigation would not be appropriate and the on-site effluent storage capacity is full. The irrigation needs of the Regional Park and central Wimberley are such that discharge of effluent from the system into Deer Creek would likely occur only in extreme wet weather conditions. Simply put, effluent discharge to Deer Creek would be a last resort. The City has applied for the State permit required to discharge highly treated effluent to the Blanco River, in the manner stated above.

5. **Why did the City of Wimberley apply for a discharge permit when it intends to reuse the effluent produced by the treatment plant?**

The City of Wimberley applied for a discharge permit even though it intends to reuse the effluent because the State Reclaimed Water Rules require that the City have "an alternative means of disposal during times when there is no demand for the use of the reclaimed water". 30 TAC § 210.1

6. **Why isn't the City of Wimberley seeking a wastewater permit that limits effluent disposal to land application only and prohibits the discharge of effluent?**

The City elected to submit an application for a discharge of effluent as opposed to only land application based on recommendations received from engineers and the Citizen's Stakeholder Group appointed by the City Council. Limiting effluent disposal to land application only is projected to add approximately $1.5 million to the project costs. The additional costs are associated with the need to construct a large (2 acre) effluent holding pond and the need to bring in large amounts of topsoil for the disposal site. The State developed the topsoil requirement at a time when it was requiring minimal levels of treatment for land application sites. As an example, it was possible to get permits with limits of 100 mg/L BOD (compared to 5 mg/L required in the discharge permit). The extra topsoil was required to provide the treatment that was not provided at the plant. This extra soil is not needed for the reclaimed water site due to the high level of treatment to be provided.

7. In the event of a discharge, where would this occur?

The discharge would be to Deer Creek on the Blue Hole Regional Park property. Deer Creek empties into the Blanco River, just downstream of the Ranch Road 12 Bridge.

8. How often would an effluent discharge into Deer Creek occur?

The frequency of discharge would be dependent on the weather. While future weather can't be predicted, daily rainfall records over the last five (5) years have been reviewed to get an idea of how often discharge might occur. Assuming that irrigation would not take place at the Regional Park on days where it rained at least 0.1 inches, or on days where rainfall in the previous three (3) days exceeded a total of two (2) inches, a discharge would have occurred less than five (5) days per year over the last five (5) years, or roughly two (2) percent of the time.

9. In times of discharge, how much effluent would be discharged into Deer Creek?

The City would be authorized to discharge up to 75,000 gallons per day. That volume is equivalent to the volume of water produced by seven (7) to eight (8) garden hoses flowing into Deer Creek in a twenty-four (24) hour period, or approximately one tenth (1/10) of the total water volume of a typical Olympic swimming pool.

10. How does the allowable volume of effluent to be discharged compare to the overall flow in the Blanco River?

The Texas Commission on Environmental Quality (TCEQ) uses the lowest seven-day flow that occurs every other year as the critical low-flow condition when

permitting effluent discharges. The critical low-flow of the Blanco River in Wimberley is thirteen (13) million gallons per day. A maximum discharge of 75,000 gallons of effluent per day is less than 0.6 percent of the flow in the Blanco River during low-flow times. It is important to note that discharges would generally be associated with wet periods when irrigation couldn't occur and when the flow in the river would be significantly higher. In such cases, effluent flows would be 0.07 percent of the flow of the Blanco River and significantly diluted by the increased river flows. On an annual basis, it is estimated that effluent discharges would represent less than 0.002 percent of the flow in the Blanco River.

11. What would be the quality of the effluent discharged?

The quality of the discharged effluent will be governed by the limits placed in the City's wastewater permit by the TCEQ. Those limits won't be known until the TCEQ does its review and modeling of quality impacts on the Blanco River in conjunction with the permit amendment that will be sought for the wastewater system. The TCEQ establishes discharge limits that protect human health and the aquatic environment. The City is committed to producing a superior quality effluent, one that is likely better than what would be required by the TCEQ. The City intends to provide a high level of treatment of its wastewater, including primary, secondary, tertiary treatment, phosphorus removal, and disinfection. With that said, it is City's intent to seek TCEQ approval of an effluent limit of 5 milligrams per liter (mg/L) of Biochemical Oxygen Demand (BOD), 5 mg/L total suspended solids (TSS), 2 mg/L ammonia-nitrogen (NH3), and 1 mg/L total phosphorus (TP). The effluent will be disinfected and would have less than 126 *E. Coli* units per 100 milliliter (ml) - a bacteria level far below that which is found on the Cypress Creek in central Wimberley today and within the acceptable limits for contact water recreation.

12. How does quality of the effluent to be discharged compare to the water quality of the Blanco River?

The quality of water in the Blanco River varies depending on weather and flow conditions. In wet periods, when effluent discharge would likely occur, the River will be carrying storm water. Typically, urban storm water has a BOD level of at least 8 mg/L, 170 mg/L TSS, 0.8 mg/L NH3, 0.5 mg/L TP, and 21,000 fecal coliform colonies per 100 ml while agricultural runoff would have a TSS of 2,270 mg/L, 11.9 mg/L total Nitrogen, and 3.7 mg/L TP. With this in mind, the effluent discharged from the proposed wastewater system will be significantly better, in terms of water quality and impact on the environment, than typical storm water runoff.

13. Can someone swim in the Blanco River downstream from where the effluent discharge occurs?

The TCEQ discharge permit limits are established to protect human health and the aquatic environment. The discharge of effluent into Deer Creek, which empties into the Blanco River, will not limit the ability of any individual to swim in the Blanco River. Bacteria levels of the effluent are well within the acceptable bacteria levels established for water contact recreation.

14. Can someone consume fish caught in the Blanco River, downstream from where the effluent discharge occurs?

The TCEQ discharge permit limits are established to protect human health and the aquatic environment. The discharge of effluent into Deer Creek, which empties into the Blanco River, will not adversely impact fish in the Blanco River or prevent the consumption of fish caught in the Blanco River.

15. Is the proposed stream discharge of effluent unique to Wimberley?

According to the TCEQ, more than ninety (90) percent of the permitted municipal wastewater systems in the State of Texas are authorized to discharge effluent on a daily basis.

16. How is the City of Wimberley's proposed discharge of wastewater effluent into the Blanco River any better than outdated septic systems leaking into the Cypress Creek?

The proposed wastewater system will greatly reduce the amount of pollutants released to the Wimberley environment. The proposed project will not increase the amount of wastewater or pollutants generated in the Central Wimberley area, but will change the manner in which it is managed. The majority of the wastewater generated in Wimberley is currently managed in individual on-site septic systems. Large particulate matter is settled out in the septic tank where it receives limited biological treatment. Effluent from the septic tank is released to the environment through underground drain fields. This effluent still contains the majority of the pollutants from the raw wastewater.

Due to the geology of the Central Wimberley area, the age of the septic systems, the unknown design standards for the systems, the apparent lack of vegetated green space required with drainfields, and the evidence of elevated bacteria in Cypress Creek, it is likely that the septic tank effluent is making its way directly to Cypress Creek with some minimal level of additional treatment as the water passes through the ground.

By contrast, the proposed wastewater treatment plant will include tertiary treatment with phosphorus removal. The effluent from the proposed wastewater system will be used for irrigation under a reuse authorization. Discharge to Deer Creek will likely be limited to very wet periods when

irrigation would not be allowed under the Reclaimed Water Rules and the effluent storage provided as part of the project is full.

The following table provides a comparison of the effluent quality between a septic tank and the proposed wastewater treatment plant.

Typical Effluent Quality

Constituent	Typical Raw Wastewater	Typical Septic Tank Effluent	Plant Effluent
Total Suspended Solids	250 mg/L	60 mg/L	5 mg/L
5-Day Biochemical Oxygen Demand	250 mg/L	120 mg/L	5 mg/L
Fecal Coliform Bacteria	10,000,000 CFU / 100 ml	1,000,000 CFU / 100 ml	200 CFU / 100 ml
Ammonium-Nitrogen	10 mg/L	40 mg/L	2 mg/L
Total Nitrogen	60 mg/L	60 mg/L	16 mg/L
Total Phosphorus	10 mg/L	8 mg/L	1 mg/L

mg/L – milligrams per liter
CFU – colony forming units
ml - milliliter
Sources: EPA Onsite Wastewater Treatment System Manual, 2002 and Crites and Tchobanoglous, *Smaill and Decentralized Wastewater Management Systems, 1998;* Requested permit limits and Tchobanoglous, George. "Water Reclamation Technologies." *Wastewater Engineering: Treatment and Reuse.* 4th ed. Boston: McGraw-Hill, 2003

17. Why does the City of Wimberley's wastewater permit application not contain limits on total nitrogen?

All plant life needs both essential nutrients of nitrogen and phosphorus to grow. When these nutrients are available in abundance in the aquatic environment algal blooms can occur. Algal blooms will deplete the dissolved oxygen in water needed by fish and other organisms. In addition, as the algae die they will decompose and can cause significant odors. Algal growth requires that both nutrients be present in sufficient quantity. The level of algal growth is limited once one of the nutrients is consumed and/or no longer bioavailable. In Texas streams the amount of phosphorus available to plants is typically the limiting factor in determining algal growth. As a result, the state has adopted phosphorus limits as its method of choice to limit algal growth in Texas fresh waters.

18. **Why is the City of Wimberley proposing to use chlorine rather than ultraviolet disinfection in the wastewater treatment process?**

Chlorine was indicated because it is the industry standard and provides less operational requirements. However, the City is not opposed to using UV.

19. **Why isn't the City of Wimberley proposing to utilize wetlands or membrane treatment to polish the treated wastewater effluent prior to discharge into the Blanco River?**

The use of constructed wetlands and membrane treatment were considered, however, the Citizens Stakeholder Group recommended that they not be included based on the following. The City intends to provide advanced treatment to its wastewater to achieve a high quality of reclaimed water. Based on the high quality level, the City views the reclaimed water as a valuable resource that can help offset demand for limited potable water resources. The City intends to stop irrigating the park with groundwater and to use reclaimed water. Beyond the unnecessary additional cost, constructed wetlands must be provided sufficient water to support plant life in order to properly function as a polishing unit. Installation of a constructed wetland would mean that this water would not be available to irrigate the park and therefore at least portions of the park would need to continue to be irrigated with groundwater.

20. **Can the TCEQ limit the number of times the City of Wimberley discharges effluent during the year?**

The State requires that all wastewater treatment plants have an approved method of disposal that is available to them. Limiting the number of days that the City could discharge could result in the City not always having an approved disposal alternative during unusually wet years.

20. **Will the wastewater treatment process proposed by the City of Wimberley remove pharmaceuticals from the effluent to be discharged?**

Municipal wastewater treatment plants are not designed to remove pharmaceuticals from wastewater. The technology does not currently exist to remove all pharmaceuticals from wastewater.

21. **Will the remaining levels of pharmaceuticals in the wastewater effluent produced by the proposed treatment plant adversely impact aquatic life and public safety in the Blanco River downstream from the discharge point?**

No, it is anticipated that any discharge of pharmaceuticals would not adversely impact aquatic life or public safety in the Blanco River. While concentrations of pharmaceuticals in wastewater have been detected at very low concentrations, the levels are significantly less than therapeutic levels directly ingested by humans. In addition, anticipated concentrations in the Blanco River will be significantly less than what is found in the effluent since the annual volume expected to be discharged from the City of Wimberley facility is less than 0.002 percent of the flow in the Blanco River.

22. **Should the TCEQ grant a wastewater discharge permit to the City of Wimberley, will the water quality of the Blanco River and Cypress Creek be monitored to determine the impact of any effluent discharges that may occur under the permit?**

Discharges to Cypress Creek are not authorized under the requested permit. The City will implement the recommendations of the Citizen's Stakeholder Group to monitor the water quality in the Blanco River. As part of this effort, the City will also monitor the water quality in Cypress Creek before it discharges to the Blanco River.

23. **What impact will the proposed discharge of wastewater effluent into the Blanco River have on aquatic ecology or contact water recreation in the Blanco River?**

Due to the high level of treatment, the infrequent occurrence of discharges, and the volume of discharges compared to the flow in the Blanco River, adverse impacts to the aquatic ecology or contact recreation in the Blanco River are not anticipated.

24. **Will the proposed discharge of wastewater effluent into the Blanco River increase the *E. coli* and pathogen levels in the Blanco River?**

No. In fact, it is anticipated that construction of the wastewater system will reduce the level of *E. coli* and other pathogens in the Blanco River. The construction of the wastewater system will not increase the amount of wastewater and pathogens generated in Central Wimberley; it will only change the manner in which it is managed. Currently the majority of wastewater is managed in on-site septic systems. These systems do not include any disinfection for pathogens; instead they rely on pathogens being filtered out in the drainfield soils. However, due to the geology of the Central Wimberley area, the age of the septic systems, the unknown design standards for the systems, the apparent lack of vegetated green space required with drainfields, and the evidence of elevated bacteria in Cypress Creek, it is likely that the septic tank effluent is making its way to Cypress Creek without disinfection or deactivation of the pathogens. With the new wastewater treatment plant, all effluent will be disinfected for pathogen control.

25. **Will the phosphorus limit proposed in the City of Wimberley's wastewater permit application prevent algae blooms in the Blanco River?**

Algal blooms require an ongoing supply of nutrients to support the growth of the algae. The infrequent discharges of effluent will not supply sufficient quantities of phosphorus to promote algal blooms in the Blanco River. In addition, it is anticipated that the amount of phosphorus reaching the Blanco River will be reduced with the construction of the wastewater system. It is believed that the failing septic systems are contributing larger quantities of phosphorus to Cypress Creek and the Blanco River on a consistent basis than would the infrequent discharges from the plant.

26. **Why is the City of Wimberley proposing to discharge wastewater effluent with a phosphorus level greater than the normal phosphorus level found in the Blanco River?**

The City requested a permit with a phosphorus limit of 1 mg/L because that is the level generally applied by the State for discharges to fresh water where phosphorus control is warranted. The State and the City have discussed lowering this limit to 0.5 mg/L in the draft permit. Over the past 10 years, phosphorus levels in the Blanco River have been measured at between 0.02 mg/L and 0.13 mg/L. Phosphorus concentrations in the wastewater effluent will typically be about the same, however, they could go as high as the anticipated permit limit of 0.5 mg/L. In the event that the plant discharges effluent with a concentration of 0.5 mg/L, it is anticipated that it will have very little impact on the concentration in the River, increasing the concentration by 0.001 mg/L.

27. **What steps will be taken by the City of Wimberley to minimize odor emissions from the proposed wastewater treatment plant and effluent irrigation areas in the Blue Hole Regional Park?**

The City will cover odor-generating units. Air from these facilities will be collected and treated to remove odorous compounds.

28. **Are any of the planned effluent irrigation areas located within designated flood plains?**

The City has no plans to irrigate land within a designated flood plain.

29. **How will the City of Wimberley make sure the proposed wastewater effluent irrigation areas in the Blue Hole Regional Park are not over-irrigated so as to avoid runoff from occurring?**

The City will install soil moisture sensors to monitor irrigation activities and limit the amount of water placed on the fields, consistent with the Reclaimed Water Rules, which prohibit the runoff of any reclaimed water.

30. **Does adequate soil cover exist in the proposed effluent irrigation areas in the Blue Hole Regional Park to prevent effluent from running off into the Cypress Creek?**

There is adequate soil cover in the subject areas of the Park for the areas to be used as effluent irrigation areas. The City intends to install soil moisture sensors to monitor the irrigated areas to limit irrigation activities so that it does not cause run off into Cypress Creek.

31. **Should runoff occur from the proposed wastewater effluent irrigation areas in the Blue Hole Regional Park, will runoff adversely impact the water quality of the Cypress Creek and Blue Hole Swimming Area?**

As previously stated, the City intends to operate the system in a manner where runoff does not occur. In the unlikely event that runoff does occur, it is anticipated that there would be no adverse impact to the water quality in Cypress Creek or the Blue Hole swimming area due to the high level of treatment provided.

32. **Does the City of Wimberley's wastewater permit application meet the TCEQ's buffer zone requirements for such wastewater systems?**

Yes. The TCEQ requires a minimum buffer of 150 feet between a treatment unit and the nearest property line. The City intends to provide twice this buffer.

33. **Does the City of Wimberley own the property along the proposed effluent discharge route to the Blanco River?**

The City owns the property for the first 0.6 miles of this distance. The Blanco River is approximately 1 river mile downstream on Deer Creek. The City is not obligated to own all property where the effluent discharge route is located.

34. **Is the City of Wimberley's proposed wastewater plant located over the Edwards Aquifer Contributing or Recharge Zones?**

The City's wastewater treatment plant will be located over the Edwards Aquifer Contributing Zone. It is approximately 9 river miles upstream of the Recharge Zone.

35. **What impact will the proposed discharge of wastewater effluent into the Blanco River have on the water quality of the Edwards or Trinity Aquifers?**

The proposed discharge is not anticipated to impact the quality of the aquifers in the area due to the level of treatment and the relatively small amount of flow. According to the USGS, the long-term annual average recharge to the Edwards Aquifer from the Blanco River Basin is 15.2 billion gallons. The average annual flow in the Blanco River is approximately 33.6 billion gallons, which means that approximately 45 percent of the flow in the River is recharged. The City anticipates that annual discharges from the wastewater plant to Deer Creek will be approximately 0.5 million gallons. If 45 percent of this discharge went to recharge, it would be approximately 0.2 million gallons or approximately 0.001 percent of the total recharge. Even if the City was to discharge the permitted amount every day, the volume would still only be 0.1 percent of the recharge from the Blanco Basin. The Blanco Basin represents 7 percent of the total recharge to the Edwards Aquifer.

36. **Does the City of Wimberley's wastewater permit application undermine the TCEQ's regionalization policy for wastewater systems?**

No. The City is amending an existing permit as opposed to requesting that a new permit be approved. In addition, the City and the Citizen's Stakeholder group considered sending the wastewater to neighboring utilities but decided against it due to the increased cost and lack of control. The City is intending to provide a higher level of treatment than the neighboring utility.

37. **How long will it take for the proposed wastewater plant to reach the interim and final permit capacities set forth in the City's application for a wastewater discharge permit?**

The treatment and discharge capacity requested in the interim phase of the permit is a conservative estimate with a safety factor for potential flows from the existing residences and businesses that will be initially connected to the system. Since the use of water within the service area is artificially constrained by the lack of adequate wastewater management, it can be expected to increase slightly once the system is constructed. However, not all water used by the customers is returned to the wastewater system. As

such, the current water consumption from the planned customers is a reasonable estimate of what can be expected at the wastewater treatment plant. The current water consumption by the customers to be connected is approximately 45,000 gallons per day. The timing for when flows would reach the capacities identified in the interim and final phases of the permit is solely dependent upon the rate of future growth. However, in order to reach the capacity in the final phase, the downtown area would need to double in population and the number of businesses.

38. Is the City obligated to provide wastewater service to individuals requesting service once the City's wastewater plant has reached the final permitted capacity being sought by the City?

The City is only obligated to provide service if capacity is available. If capacity is not available, future development would be required to pay the cost of developing additional capacity. Based on City Council acceptance of the Stakeholder recommendation that flows beyond 100,000 gallons per day be sent to Aqua Texas, this cost would involve the development of the system necessary to send wastewater to the Wood Creek plant. In addition, future customers would be required to pay any associated impact or tap fees to Aqua Texas.