



Resolution No. 20240530-116

Staff Report on Barton Creek Interceptor

November 6, 2024

On May 30, 2024, City Council approved [Resolution No. 20240530-116](#) that described the history and attributes of a wastewater interceptor currently known as the Barton Creek Interceptor (BCI). In addition, the resolution contained the following directives:

- The City Manager is directed to develop a report that identifies options for moving the wastewater interceptor out of the Barton Creek Critical Water Quality Zone (CWQZ) and restoring needed capacity in the interceptor, including the related costs, benefits, risks, and a potential timeline.
- The City Manager is directed to work with the representatives of proposed redevelopment projects serviced by the Barton Creek wastewater interceptor to address wastewater treatment needs while a permanent solution is being explored, with the goal of facilitating redevelopment that improves environmental protection over the status quo through decreased impervious cover, improved water quality treatment, rewilded creek buffers, and/or other measures in alignment with current Code.
- The City Manager is directed to return to the Austin Water Oversight Committee on November 12, 2024, with the report on options for addressing the Barton Creek Wastewater Interceptor and an update on staff facilitation of redevelopment as described above.

Study Area

The study area for this analysis is shown in Exhibit 1 and includes 2,100 acres, generally bounded by Barton Creek on the south, Rabb Road on the east, Lake Austin on the north and Little Bee Creek in the west.

The study area is primarily developed and includes numerous residential subdivisions, various commercial developments along Loop 360 including Village at Westlake, the City of West Lake Hills, the City of Rollingwood, the Barton Hills subdivision, and a variety of commercial and multi-family development along Mopac Expressway, including Barton Creek Square Mall. The Lost Creek subdivision is outside the study area, and is currently served by the Lost Creek Wastewater Treatment Plant.

The BCI is located east of Mopac, south of Barton Springs Road, north of Loop 360 and west of Barton Creek. The interceptor itself generally runs parallel to Barton Creek and

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the Barton Creek Greenbelt Hike and Bike Trail. The interceptor was designed to serve the entire Barton Creek watershed.

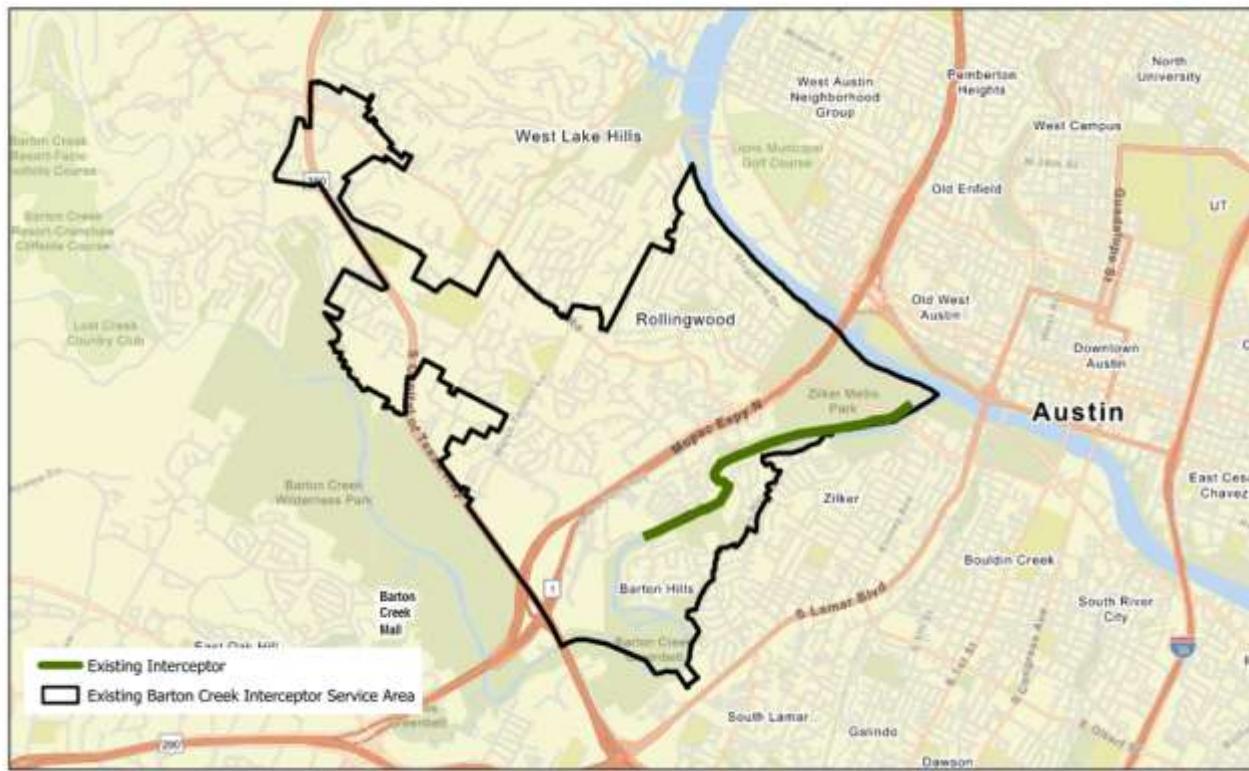


Exhibit 1. Study Area

Existing Development

The Save Our Springs Ordinance (SOS) was adopted in 1992 and differed from its predecessors because it became law by citizen initiative. Two ordinances that preceded the SOS Ordinance include the Interim and Composite Ordinances. These ordinances addressed development in the Barton Springs Zone, which includes Barton Creek and the other creeks draining to or crossing the Edwards Aquifer recharge zone.

Highlights of these ordinances included: the first requirements for non-degradation (based on stormwater discharge concentrations) and provisions that excluded variances unless a demonstrable improvement in water quality was shown. Variances, which made departures from an ordinance permissible, were a general feature of watershed ordinances up until this time.

The SOS Ordinance, applied throughout the Barton Springs Zone, required non-degradation (based on total average annual loading), as well as lowered impervious cover to 15 percent of the net site area (NSA), which includes only the portions of a site that lie in an uplands zone (land not included in a critical water quality zone or a water quality transition zone), for all development in the recharge zone, 20 percent NSA for

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development in the Barton Creek portion of the contributing zone and 25 percent NSA for development in the remaining portions of the contributing zone in Williamson, Slaughter, Bear, Little Bear and Onion Creeks.

Many properties within the Barton Springs Zone were developed before the Save Our Springs Initiative (SOS) was adopted. These properties may have:

- **More impervious cover** than is currently allowed under SOS regulations.
- **Substandard or no water quality treatment**, which can lead to pollution in creeks or the Edwards Aquifer.
- **Development closer to sensitive areas** than would be permitted today, such as near creeks, springs, and recharge features.

To redevelop such properties, applicants must comply with either SOS regulations or a "redevelopment exception." Redeveloping older properties can have water quality benefits because new projects are required to:

- **Improve onsite water quality treatment** to remove pollutants from impervious surfaces.
- **Reduce or restore impacts on environmental buffers**, such as creeks and springs.
- **Provide mitigation**, such as purchasing or restricting mitigation land or contributing to a fund for land acquisition.

In 2002, most of the BCI was "right-sized" to convey wastewater flows generally limited to existing collection system customers, designated outstanding wastewater commitments, and limited development of specific vacant lots. The design flows (Consensus Group Design Flows) for the right-sizing project were established in the 1996 Robert E. Lee Road Relief Interceptor Study prepared by Espey, Huston & Associates, Inc. (1996 Relief Interceptor Study) and the subsequent 1997 Robert E Lee Road Relief Interceptor Planning Study Report of the Consensus Building Group (1997 Consensus Group).

The right-sizing project included construction of comprehensive changes to numerous segments of the BCI over its entire length. These modifications permanently reduced the amount of wastewater that the interceptor can convey, including installing smaller pipes inside the larger pipe and grouting them in place.

The 1997 Consensus Group study established maximum wastewater flows allowed from each section of the study area. Since the completion of the right-sizing project, Austin Water has referred to this allocation in reviewing service extension requests for new and redevelopment in the study area.

Barton Creek Health

Watershed Protection staff report that Barton Creek is one of Austin's healthiest streams. Compared to the watersheds in the Austin area sampled in the Environmental Integrity Index (EII) over the past 10 years, it is the 6th highest-scoring watershed in terms of water quality score (Figure 1) and contact recreation score (Figure 2). The Water Quality Score is a function of nutrients and physicochemical parameters while the Contact Recreation Score is a function of *E.coli* bacteria. These parameters are an indicator of contamination from wastewater.

Barton Creek is composed of several stream segments, the most downstream of which is Reach 1, which extends from the Capital of Texas Highway to the dam upstream of Barton Springs Pool. The Water Quality Score of Barton Reach 1 has no significant trend over time (2006-2023, Figure 3), fluctuating between a low of 56 and a high of 70, which corresponded with years of extreme dry and wet, respectively. The average value for Barton Reach 1 over this period is 63 compared to the average value of 60 for all EII Water Quality Scores.

The parameter that would be most influenced by wastewater contamination is *E.coli* bacteria. All but two samples collected since 2006 have been below the TCEQ single grab sample threshold for primary contact recreation (399 MPN/100ml, orange line) as well as the EII average for all stream segments (330 MPN/100ml, yellow line) (Figure 4).

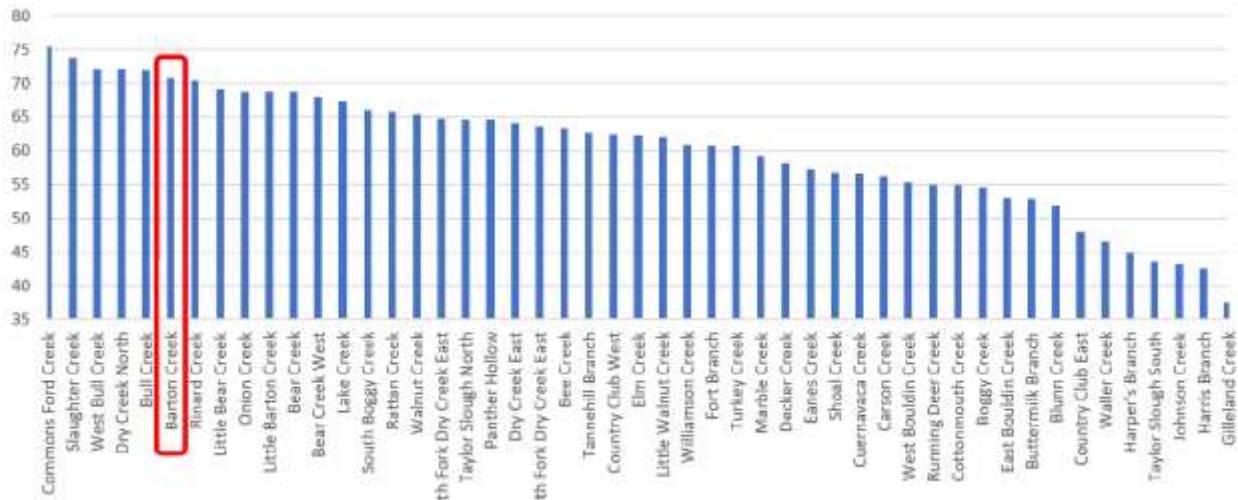


Figure 1. Average (2013-2023) Water Quality score by EII

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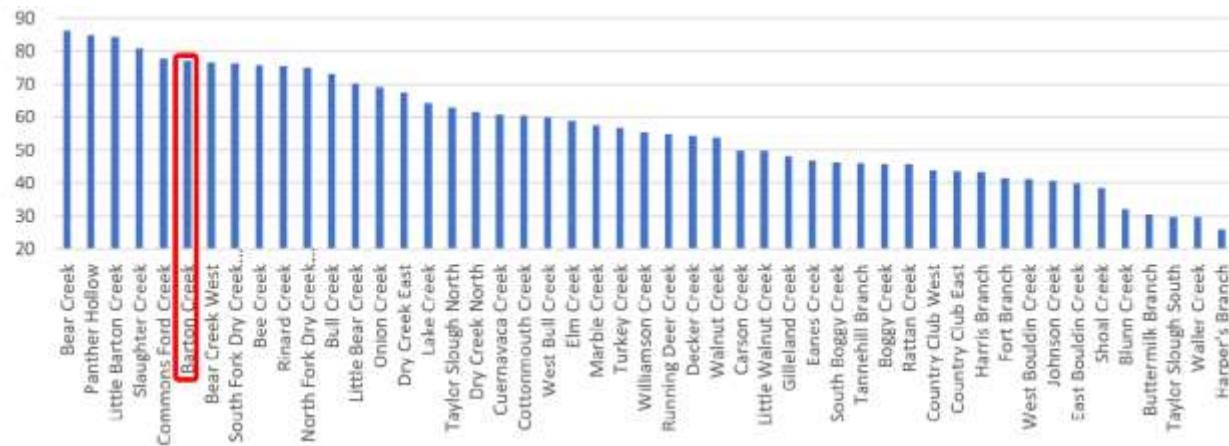


Figure 2. Average (2013-2023) Contact Recreation score by EII

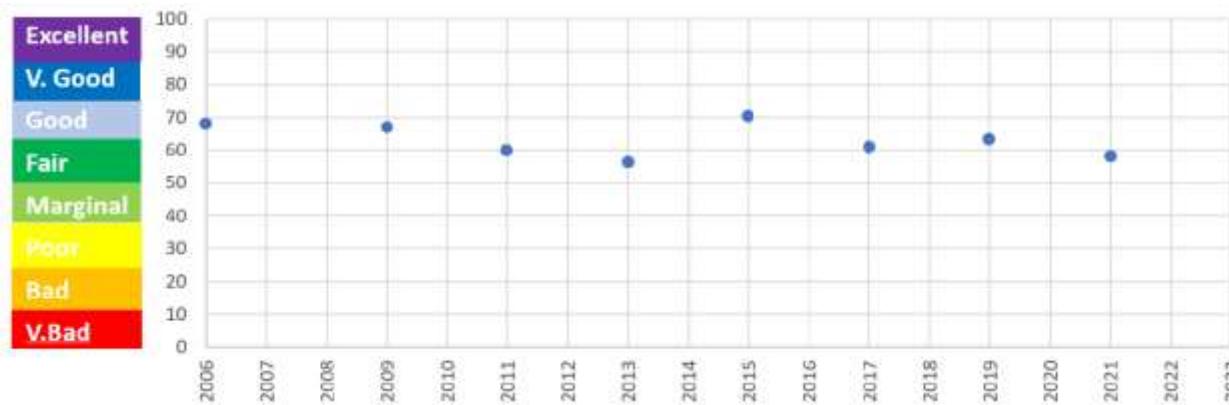


Figure 3. EII Water Quality scores for Barton Creek Reach 1

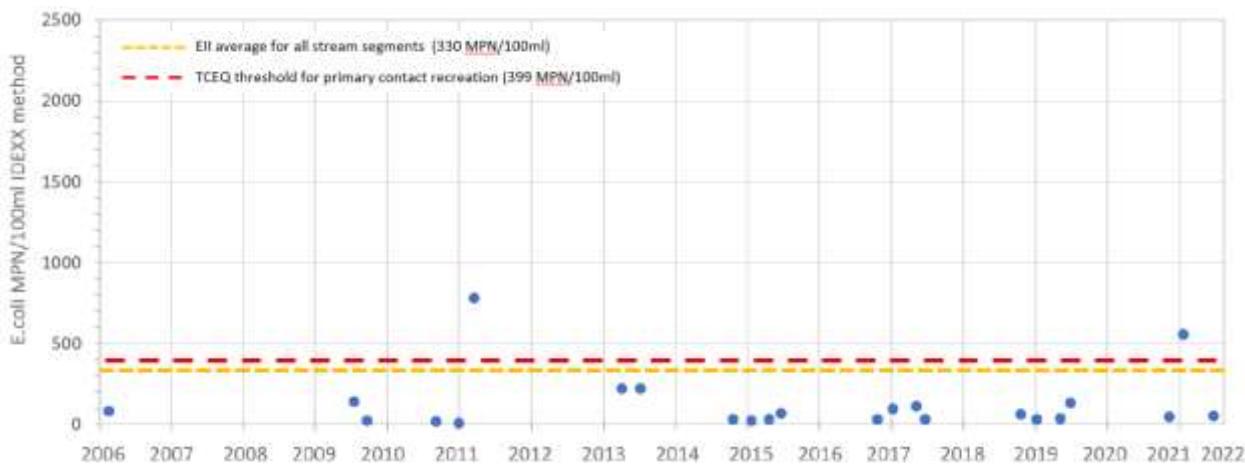


Figure 4. *E.coli* concentrations from all EII samples collected 2006-2023

Barton Creek Interceptor Condition and Capacity

The BCI was originally constructed in the 1960s and generally follows the alignment of Barton Creek. At the time it was constructed, it was common to locate wastewater interceptors at the natural low point of a drainage basin, often in close proximity to or even within creeks. Today, Austin has designated the Critical Water Quality Zone (CWQZ) to reduce development encroaching on and impacting these important natural features. The CWQZ for Barton Creek is 400 feet on either side of the centerline of the creek.

The BCI is approximately 11,050 linear feet of mostly 24-inch to 36-inch fiberglass reinforced plastic pipe (FRMP). FRMP is a composite material that combines fiberglass and resin, giving the pipe high strength, durability, and corrosion resistance.

The BCI alignment includes significant encroachments on Barton Creek, which would not be acceptable if the interceptor were constructed today:

- Approximately 9,900 linear feet (90%) in the CWQZ
- Approximately 4,900 linear feet (45%) in the Erosion Hazard Zone
- Approximately 10,900 linear feet (98%) in the 100-year flood plain

There are 13 service connections along the interceptor. To the west, there are eight service connections, and to the east, there are five service connections that cross under the creek and tie into the BCI.

The BCI's performance has been very good, with no reported breaks or repairs. In reviewing the sanitary sewer overflow (SSO) history for this interceptor, there was one occurrence in 2015, which resulted in a 50 gallon spill due to a blockage in the pipe. AW regularly performs video inspection of the wastewater collection system. The BCI was inspected between 2021 and 2024, with the exception of one section that was last fully inspected in 2010. That section is planned for inspection this year utilizing a new contract for specialized access. This specialized access is necessary due to horizontal deflections in the existing pipe that prevent access via manholes.

Flow monitoring in the BCI and hydraulic modeling indicate that the 2024 wastewater flows in the BCI are lower than the design capacity of the existing interceptor.

Comparisons of current wastewater flows to the available capacity of the existing BCI indicate that at expected rates of development and redevelopment in the contributing wastewater basin, there should be adequate remaining capacity for ten or more years, until planning, design, and construction of additional interceptor capacity can be completed.

Flow monitoring and hydraulic modeling of the upstream contributing interceptors west of Mopac Expressway indicate that the Bee Cave Lift Station and the Skunk Hollow Interceptor are at or near capacity. Existing peak wet weather flows into the Bee Cave

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Lift Station and the Skunk Hollow Interceptor may exceed the capacity of the existing infrastructure at certain times. The 1996 Relief Interceptor Study and the 1997 Consensus Group identified the Thousand Oaks Interceptor as a proposed solution to address these wastewater capacity constraints.

The Thousand Oaks Interceptor or other wastewater capacity increases would need to be made to serve growth or redevelopment in the areas upstream of the Bee Cave Lift Station and the Skunk Hollow Interceptor. Austin Water has continued to assess the proposed Thousand Oaks Interceptor CIP project for some time. This project would be necessary to accommodate additional wastewater flows associated with development or redevelopment in the area.

Proposed Development and Redevelopment

AW's Utility Development Services staff identified six representative stakeholders that are currently served by the Barton Creek Interceptor, shown in Exhibit 2. These stakeholders include commercial properties, a multi-family property, and two independent municipalities, including:

- City of Rollingwood
- City of West Lake Hills
- Woods at Barton Skyway: a proposed multi-family redevelopment requesting wastewater service above the Consensus Group Design Flows
- Palisades West: an existing office requesting to abandon its onsite treatment system and cutover to the City's system, which is prohibited by the 1997 Consensus Group (site restricted to decentralized/onsite treatment)
- Barton Creek Mall: an existing retail mall with proposed mixed-use (residential, hospitality, restaurant, retail, etc.) redevelopment that requires wastewater service above established flow limits included in their development agreement and anticipated by the 1997 Consensus Group
- The Terrace PUD: an existing multi-family and office with future phases of residential and commercial uses that are subject to flow limits included in their development agreement and anticipated by the 1997 Consensus Group

Staff met with stakeholders to discuss their utility service needs and proposed redevelopment on their property or within their service area. Staff explored options for interim service plans to provide wastewater service to their projects and onsite opportunities to reduce wastewater discharge. Although most of these projects could not feasibly incorporate onsite black water reuse that would have the effect of reducing wastewater flow into the Barton Creek Interceptor, staff emphasized value in

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incorporating onsite water reuse and other water conservation measures to help preserve and extend water supply for the community overall.

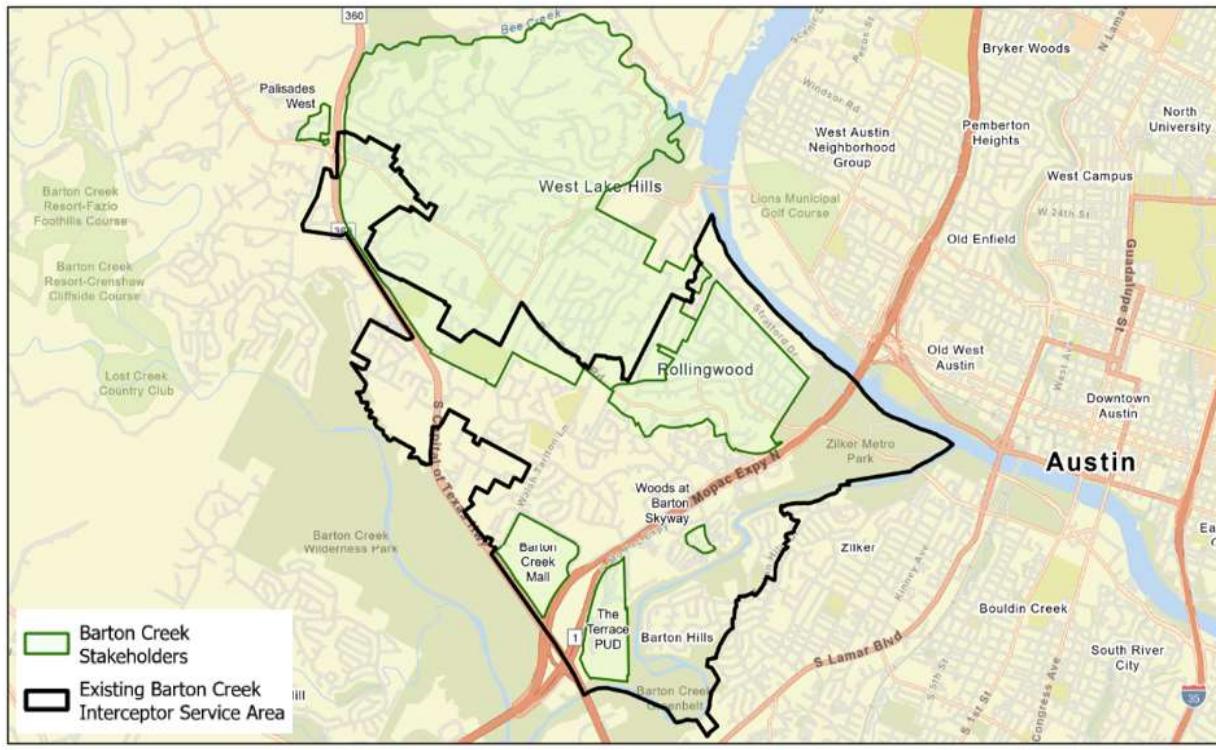


Exhibit 2. Representative Stakeholder Customers of the BCI

Wastewater Service West of Mopac Expressway

The majority of projected future flows are located west of Mopac. To serve these flows, a conceptual alignment for a new interceptor was developed. The “Mopac Interceptor” would be constructed along Mopac Expressway from Capital Parkway to Barton Springs Road to an existing shaft located along Toomey Road .

Additionally, the Thousand Oaks Interceptor would be constructed to address existing wastewater capacity constraints in the existing Skunk Hollow Interceptor and allow the decommissioning of two lift stations. These improvements are shown in Exhibit 3.

The Mopac Interceptor would have the following features:

- Approximately 13,900 linear feet, with a planning level construction cost of \$60 million and an implementation timeline of approximately 10 years
- No new lift stations
- Elimination of two existing lift stations (requires Thousand Oaks Interceptor)
- Elimination of three existing crossings under Mopac Expressway

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- No new crossings of Barton Creek
- Reduce the BCI contributing service area to local flows (a reduction of approximately 65% based on current winter averaging data)
- Overall encroachments would be limited
 - Approximately 2,400 linear feet (17%) in the CWQZ
 - Approximately 1,600 linear feet (12%) in the Erosion Hazard Zone
 - Approximately 1,800 linear feet (13%) in the 100-year flood plain

The construction of the Mopac Interceptor could be coordinated with the proposed Central Texas Regional Mobility Authority (CTRMA) MoPac South improvement project. Currently, the project is completing the Environmental Assessment (EA) per the National Environmental Policy Act of 1969.

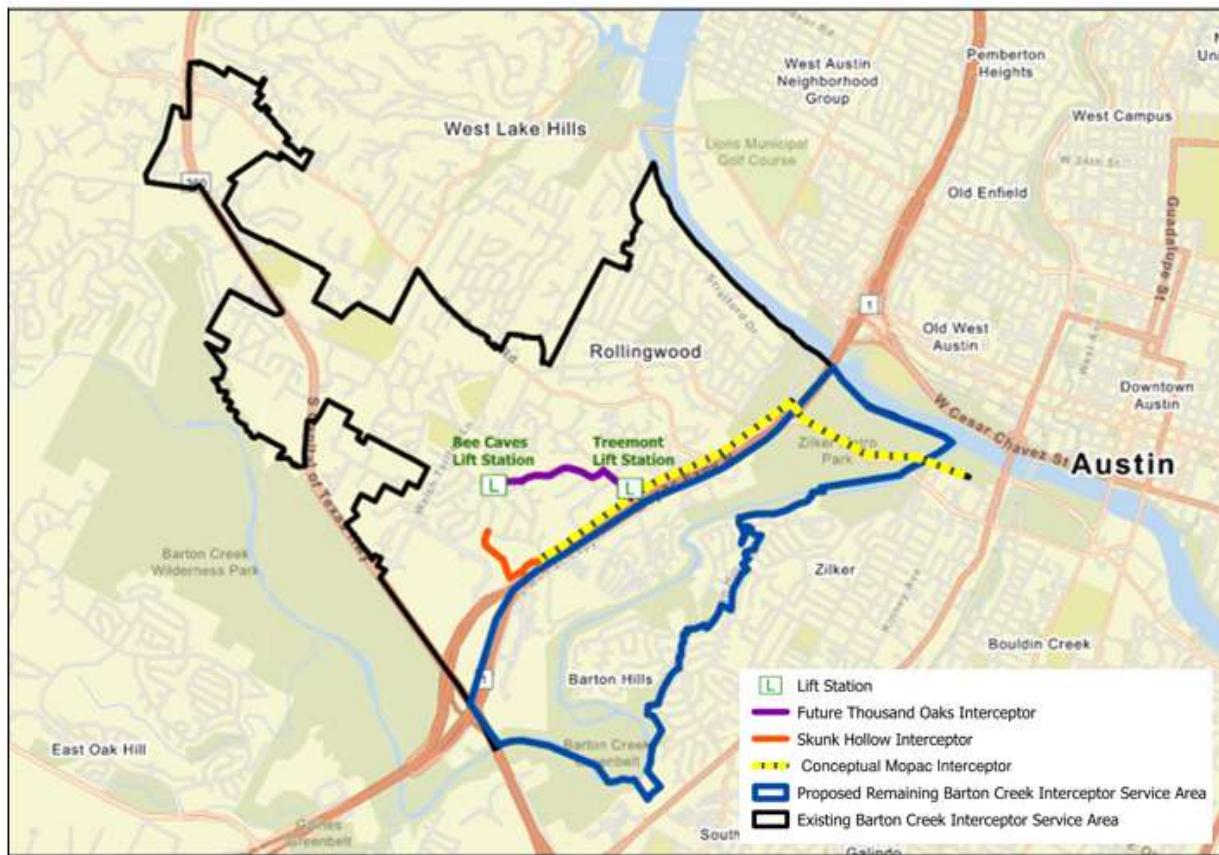


Exhibit 3. Mopac, Thousand Oaks, and Skunk Hollow Interceptor Alignments

Relocation of the Barton Creek Interceptor

With the construction of the Mopac Interceptor, flows to the BCI would be reduced to “local” flows, approximately 35% of current flows to the interceptor. Exhibit 4 shows the BCI local service areas and CWQZ. As directed by the resolution, staff reviewed alternatives to remove the BCI from the Barton Creek CWQZ.

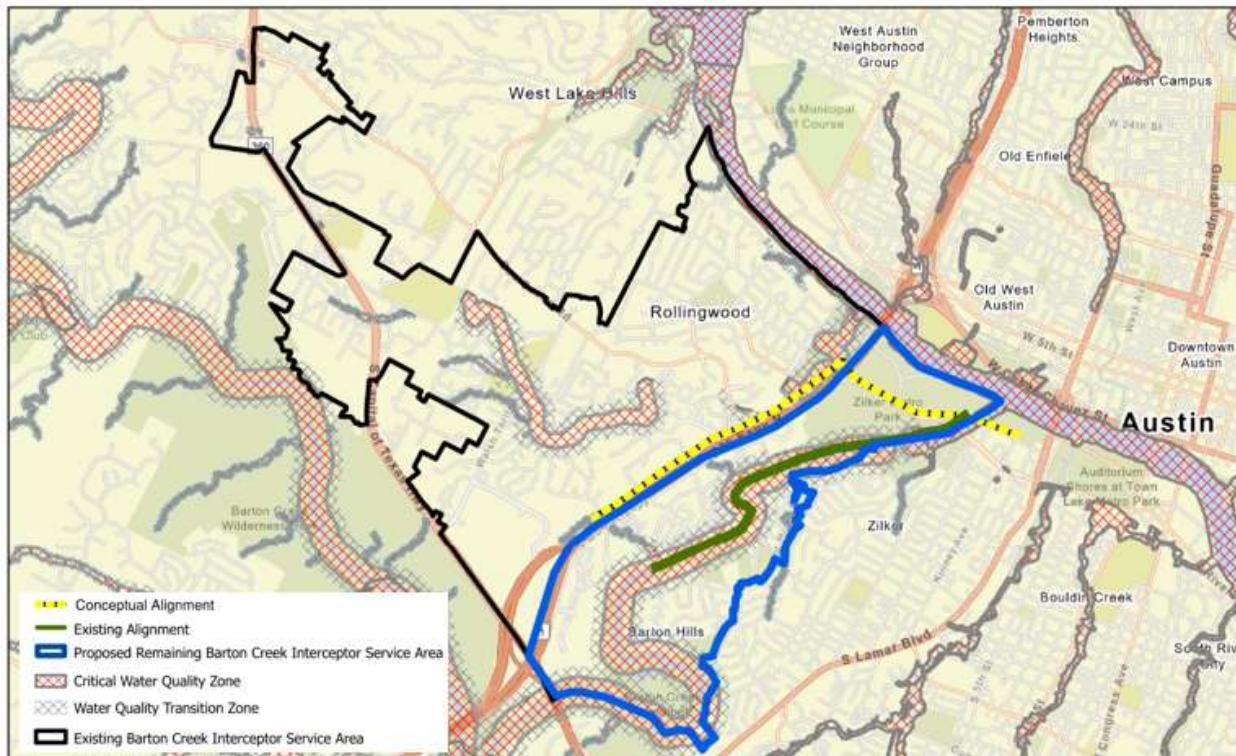


Exhibit 4. BCI Local Service Area and CWQZ

Evaluation Criteria

The elevation of the BCI allows it to serve existing customers by gravity, despite a vertical elevation change across the service area of more than 200 feet. The Barton Creek top of bank elevation varies from 440 ft msl to 500 ft msl. Existing foundation slab elevations vary from 480 ft msl to 690 ft msl east of Barton Creek, and from 490 ft msl to 680 ft msl on the west side of Barton Creek. The approximate flowline of the interceptor is from elevation 451 feet above mean sea level (ft msl) to 437 ft msl, a drop of about 14 feet with an average slope of 0.13%.

Local flows from properties west of Barton Creek are delivered to the BCI at eight connection points. Local flows from properties east of Barton Creek are delivered to the BCI at five connection points that cross under the creek.

Exhibit 5 shows the elevation map of the Barton Creek watershed, showing the BCI at the low point of the basin. The Mopac Interceptor would collect flows to the west.

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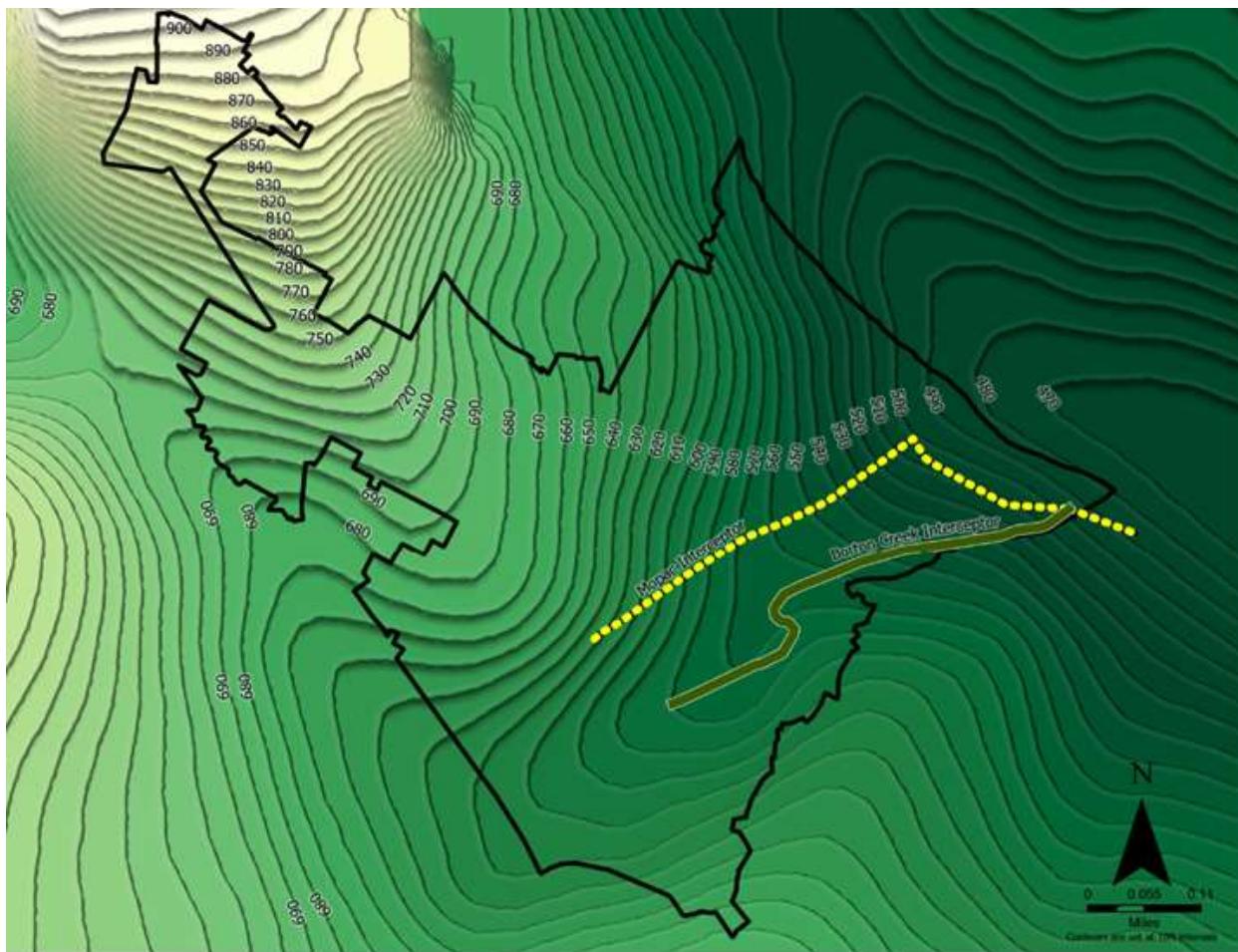


Exhibit 5. Barton Creek Watershed Elevation Map

To determine feasible alternatives to remove the BCI from the CWQZ, the following key elements were considered:

- **Provide service to existing customers:** All alternatives must be able to provide service to existing customers being served by the BCI.
- **Avoid displacing existing homes:** Alternatives must not require acquiring the property of existing homes to construct wastewater infrastructure.
- **Minimize lift stations:** With an elevation change of over 200 feet within the service area, relocating the BCI would require wastewater pumping stations, commonly referred to as lift stations, to move wastewater from lower elevations to higher elevations. Wastewater lift stations rely on mechanical pumping systems driven by electrical motors. These systems introduce operational complexity and failures can cause significant SSOs. Lift stations provide lower resiliency than well-maintained and regularly-inspected gravity wastewater systems.

- **Provide access for maintenance:** Steep slopes may compromise access for maintenance and inspection, influencing the design and location of access points.
- **Avoid environmental impacts:** Pipe routing should minimize environmental impacts and concerns, including new crossings of Barton Creek.
- **Achieve regulatory compliance:** Pipe routing must meet all city, state, and federal regulations regarding wastewater collection.

Alternatives Evaluation

Two alternatives for a new interceptor east of Barton Creek and outside the CWQZ were identified, but neither was determined to be feasible. Exhibit 6 illustrates the challenges of relocating the BCI.

1. A new interceptor along the creek but located outside the CWQZ:
 - Service to customers on the east side of Barton Creek could be accomplished by gravity without crossing the creek.
 - Service to customers on the west side of Barton Creek would require seven new crossings of Barton Creek.
 - Routing of the interceptor would require acquiring the properties of existing homes.
2. A new interceptor routed through the Barton Hills Neighborhood, along Bluebonnet Lane, Folts Avenue, and Barton Boulevard, delivering wastewater flows to existing infrastructure in Toomey Road:
 - Service to customers on the east side of Barton Creek would require five new lift stations. Most would be located in the CWQZ and 100-year floodplain or require acquiring the properties of existing homes.
 - Service to customers on the west side of Barton Creek would require seven new lift stations and crossings of Barton Creek. Several lift stations would be located in the CWQZ and 100-year floodplain.

Staff also evaluated serving customers west of Barton Creek from the Mopac Interceptor, which would also require seven lift stations and force mains.

Current requirements for new lift stations in AW's service area require elevating electrical equipment above the 100-year flood plain, permanent installation of a diesel or natural gas generator, driveways and security gates to provide operations and maintenance access for AW vehicles, and intruder-resistant fencing, security cameras, and vegetation clearing.



Exhibit 6. Elevation Cross Section: Barton Creek Area

Recommendations

Based on this evaluation, as well as the condition and capacity of the existing interceptor, staff recommend maintaining the BCI in service with continued heightened surveillance of the pipe condition and performance.

Next Steps

Since the completion of the 2002 BCI right-sizing project, wastewater service in the BCI service area has been governed by the 1997 Consensus Group study, which established maximum wastewater flows from each section of the study area.

Flow monitoring in the BCI and hydraulic modeling indicate that there should be adequate remaining capacity in the BCI to support expected rates of new development and redevelopment in the contributing wastewater basin until the planning, design, and construction of the Mopac Interceptor could be completed.

Should City Council direct the City Manager to take steps to provide wastewater service for new development and redevelopment in the area, Austin Water would implement the following:

1. Continue wastewater flow monitoring to verify existing wastewater flows and potential redevelopment impacts to future wastewater flows in the BCI
2. Continue condition assessment and monitoring of BCI at regular intervals

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3. Initiate preliminary engineering for Thousand Oaks and Mopac interceptor projects
4. Evaluate service extension requests (SERs) in accordance with the City's SER policy (rather than the 1997 Consensus Group Study). As the projects advance through SER application and review process, AW staff will evaluate wastewater service needs, system impacts, sizing of system upgrades, and onsite water reuse and other water conservation opportunities.
 - City code (LDC 25-9-61) prohibits City cost participation for oversized wastewater infrastructure that provides service within the Drinking Water Protection Zone.
5. Continue encouraging new development and redevelopment projects to voluntarily incorporate onsite water reuse and water conservation measures, even if they may not otherwise be required per Code or if the project is exempted by age from compliance with current Code.

Staff will brief the Austin Water Oversight Committee on these matters on November 12, 2024. The agenda and briefing materials will be posted at [2024 Austin Water Oversight Committee Meetings | AustinTexas.gov](https://www.austintexas.gov/2024-austin-water-oversight-committee-meetings).