



March 18, 2023

Ms. Laurie Gharis
Chief Clerk
Texas Commission on Environmental Quality
MC-105
P.O. Box 13087
Austin, Texas 78711-3087

VIA ELECTRONIC FILING

RE: Gapped Bass LLC Permit Application WQ0005397000; Comments, Requesting Review of Integrated Assessments of Segment 1428, and that Anti-Degradation determination be reexamined.

Dear Ms. Gharis:

These comments on the above referenced application are submitted on behalf of Environmental Stewardship and its members.

The initial comments of Environmental Stewardship are provided in the attached listing of issues, concerns and objections. Attachment 1. Environmental Stewardship would be pleased to discuss these matters with Gapped Bass and/or TCEQ to resolve all or any. If the concerns and objections are not resolved, Environmental Stewardship reserves its right to a contested case hearing contingent on resolving all issues raised herein resulting from the application and draft permit.

Environmental Stewardship is a Texas non-profit that works to protect the Colorado River, Matagorda Bay, and the Carrizo-Wilcox Aquifer group in the lower basin. Environmental Stewardship has members who own property adjacent to and near the irrigation field and outfall to the river and have drinking water and/or irrigation wells downgradient from the proposed land disposal spray field, who would be adversely affected by the proposed discharges. They also have concerns about the level of nuisance conditions, such as noise, and light, and the potential increase in insect vectors of disease, such as mosquitos. Moreover, these and other Environmental Stewardship members are concerned about the overall ecological health of the Colorado River, its tributaries, and the aquifers of the region.

For example, one member with property adjacent to The Boring Company/Gapped Bass LLC property, has an exempt irrigation well within approximately 1300 feet of the proposed sprayfield that went dry and burned out the pump soon after The Boring Company started operations. The landowner also has two other exempt domestic wells that source drinking water from an aquifer

in near proximity of the sprayfield. Other landowners have domestic wells in the region that draw water from the aquifers, including the Colorado Alluvial Aquifer, that exchanges water with the river and the Calvert Bluff, Simsboro, and Hooper Aquifers of the Wilcox Group.

Another member with adjacent property has a domestic well that his family depends on for domestic use, and has experienced nuisance noise, night light, traffic, and unauthorized expansions of TBC operations.

Other members have a certified-organic farm on Wilbarger Bend across the river from TBC's operations and depend on wells in the Colorado Alluvial Aquifer (CAA) to irrigate their crops and to retain their certified-organic status. They are concerned about the impact of TBC's land application of wastewater that might likely contaminate the quality of water available for their organic farming operations and the potential of direct disposal into the river that would likely contaminate their well.

Other members down river from TBC's operations are concerned about potential contamination of their groundwater well as a result of continuing degradation of the water quality in the river that can result in contamination of shallow aquifers.

Other members landowners with riparian rights down river from The Boring Company are concerned about potential contamination of surface water of the Colorado River, and the alluvial aquifer, as a result of degradation of the water quality in the river, and the alluvial aquifer, due to direct discharge, and potential contamination that will likely result from the proposed permit application.

Applicant's Experience and Reliability

It does not appear that Gapped Bass LLC or its consultants for the application 1) have adequate experience with the siting, design and operations, storage, treatment, application, and discharge facilities, and with the monitoring, recording and reporting requirements, given the proposed land application and discharge, for the management of the wastewater to assure compliance with any permit that might be granted, Texas laws and regulations, or 2) is willfully acknowledging and complying with such laws and regulations, but rather, may be purposefully avoiding such obligations.

The application does not demonstrate that the entire technical report 1) was prepared by a registered professional engineer or a qualified person who is competent and experienced in the field to which the application relates and thoroughly familiar with the operation or project for which the Application is made, as is clearly required by TCEQ rules at 30 TAC §329.8 (a) , or 2) is willfully designed to protect, or enhance, the ecological paradise that our members and constituents enjoy and expect the applicant to affirmatively protect or enhance.

For example, the technical report does not address the discharge of waste waters that, once applied to the land, will migrate into the Colorado River. It does not address the discharge location, or how waste waters will be managed when the ground at the application site is frozen or saturated. It does not indicate the depth to the aquifer below the ground surface of the

sprayfield, nor the identity of the aquifer. [Based on the information Environmental Stewardship has on the landowner well that went dry, the depth to water at the sprayfield is less than 25 feet, and likely much shallower.] It further does not willfully address how the applicant will address situations where the sprayfield is inadequate, but rather, simply offers the solution "to dispose of in the river" without assuring that such disposal will not contribute to further degradation of the river.

Moreover, even a number of requirements in the administrative report of the initial application were not completed or completed properly, until after receiving several deficiency letters from TCEQ. And Gapped Bass already has been cited by TCEQ, TxDOT, and Bastrop County for failure to comply with Texas laws.

Overall, the Application does not demonstrate that the applicant 1) has investigated the interactions between the Colorado River and the aquifers in the immediate and general area of the requested wastewater operation, 2) understands the exchanges of groundwater and surface water that are likely to occur, nor 3) developed adequate plans to manage the wastewater discharge operations in a way that protects these critical community and/or privately owned water resources.

Integrated Water Quality Reports & Anti-Degradation Reviews

It has become clear to persons that use and recreate on this reach of the river that the water quality and ecology of the Colorado River below Austin have been degrading over the past decade and are likely impaired. Two segments (1428 and 1434), that have the highest aquatic and recreational use standards in the state, are falling short of meeting the standards set in the 1980's and early '90's and updated in 2018. (TAC, Title 30, Chapter 307.10(1), Appendix A - pages 29-31.)

Environmental Stewardship *strongly* objects to the statement that Segment No. 1428 of the Colorado River is not currently listed on the State's inventory of impaired and threatened waters (the 2022 CWA § 303(d) list) since this implies that the river is meeting exceptional standards. To the contrary, there are numerous citations of ecological/biological, physical, and chemical impairment concerns that have been repetitively listed for this section of the river since 2006 and earlier. The evidence shows that for more than 17 years concerns have been raised about impairment of fish and macrobenthic communities, as well as physical and chemical that do not support water quality standards, yet these concerns have not been adequately investigated.

Environmental Stewardship asserts that segment 1428 is likely impaired according to the 2020 and 2010, 2008, and 2006 Texas Integrated Reports, and should either be on the 303(d) list of impaired streams, or assumed to be impaired, and should be subject of management strategies to remedy the impairments and a proper anti-degradation review.

In reviewing the 2020 Texas Integrated [Assessment] Report¹ for the Colorado River (Basin 14) it is clear that concern for impaired fish and macrobenthic communities in these segments of the river may not only be currently impaired, but many of these impairments are carried forward from the 2006 report "due to inadequate data for this method of assessment".

Even more concerning is that many of the impairments that were listed in the 2020 report, were de-listed on July 7, 2022, after new guidelines were adopted.² No justification for these de-listings is found in the record. Attachment 2.

In order that Environmental Stewardship, and the public, are able to review and evaluate such studies as may have been conducted, we are requesting copies of the anti-degradation reviews on the receiving waters (Tier 1 and 2), and the studies that underlay these reviews.

Colorado Alluvial Aquifer Interaction with Colorado River and Wilcox Aquifer Group.

Environmental Stewardship is concerned that adequate consideration has not been given to the impacts of the interactions that will likely occur between the proposed sprayfield, the Colorado Alluvial Aquifer (CAA), the Colorado River, and the Wilcox Aquifer Group.

The close proximity of the sprayfield already located directly above the Colorado Alluvial Aquifer poses high risk of direct contamination of the Colorado River, Calvert Bluff, Simsboro and Hooper aquifers (Wilcox Group) as a result of water that is exchanged between these formations.

The Colorado River, as it runs through Bastrop County, is primarily a gaining stream as it is recharged by groundwater flowing from the Wilcox Aquifer group by way of the Colorado Alluvial Aquifer (CAA). Likewise, when the river flows are high, or at flood stage, water flows into the aquifers from the river by way of the alluvial aquifer (CAA). The application of treated wastewater over the alluvial aquifer, contributes an additional flow of potentially contaminated water into both the Colorado River and the Wilcox Aquifer Group by way of the alluvial aquifer, thus increasing the chances of contaminating these waters with both industrial and domestic wastewater components.

Furthermore, wastewater discharged directly into the Colorado River also recharges the Wilcox Group of Aquifers in this segment of the river. Comments submitted by Graves, Dougherty, Hearon, and Moody on behalf of the Management Committee of the Lost Pines Groundwater Conservation District Board of Directors³ further describes the high geologic sensitivity of this segment of the Colorado River and the important hydrologic connections it has to the major and minor aquifers within the district's jurisdiction. Both the quality and quantity of water involved in this hydrologic connection is of great importance to the future of Central Texas.

¹ The Texas Integrated Report describes the status of the state's waters, as required by Sections 305(b) and 303(d) of the federal Clean Water Act. It summarizes the condition of the state's surface waters, including concerns for public health, fitness for use by aquatic species and other wildlife, and specific pollutants and their possible sources. <https://www.tceq.texas.gov/waterquality/assessment/20twqi>

² 2022 Guidance for Assessing and Reporting Surface Water Quality in Texas, July 7, 2022.

³ Natasha J. Martin filed electronically on Permit No. WQDO13977001, March 13, 2022.

To quote from the comments submitted on behalf of the Management Committee,

"In a report prepared by well-published hydrogeologist and engineer Dr. Bill Hutchison, attached as Exhibit B, there is proof that surface water from the Colorado River in Bastrop County communicates with the aquifers in the District.⁶ The report reveals flow losses in the Colorado River and those losses contribute to increases in the groundwater water table. These losses indicate that the Colorado River provides recharge to the aquifers in the same vicinity of the Corix^[4] discharge.

Groundwater and surface water interaction or communication must be addressed by TCEQ. In addition, these aquifers and the surface water feeding them serve as a primary water supply for many in the region. TCEQ's own documents acknowledge the significance of the Colorado River Segment No. 1428's designated use of "Domestic Water Supply Use."⁸ The sensitive environment in this unique hydrogeologic setting, the regional dependence on groundwater for drinking water supply, and the known interaction between surface water and groundwater are extraordinary circumstances that will be affected by the Corix's application. TCEQ may not issue a permit unless existing uses are maintained, and must prevent the degradation of waters, both surface water and groundwater.⁹"

The above comments apply equally to the discharges requested by the Gapped Bass permit application on behalf of The Boring Company in this same geologic sensitive segment of the Colorado river and should likewise be considered as a part of this permit review process. Attachment 3.

A Unique Opportunity to Establish Standards for the Conjunctive Use and Management of the waters of the Colorado River and the Wilcox Aquifer Group by Municipal, Industrial, Agricultural, Domestic, Aquatic-Life, and Recreational, users of these water resources in Central Texas.

Environmental Stewardship's overall goal is protection of the exceptionally high-quality waters and aquatic-life use in this segment of the Colorado River and the groundwater aquifers that exchange water with the river. Our members goals further extend to the protection of their interests in the use of these waters for domestic, irrigation, and recreational use. The Applicant's goal is to use these waters to further their industrial and municipal interests.

A primary interest of The Boring Company is to conduct research to improve upon its ability to bore tunnels in the vicinity of rivers, aquifers, and other natural land resources in order to further their commercial interests. In doing the research and development of such boring technology, it is a reasonable extension to understand the impacts of the technology on the natural water and land resources impacted by the tunneling processes, whether directly or indirectly through the alteration, use, treatment, and disposal of such natural resources.

As such, it seems that these interacting goals and interests, coming together in this uniquely sensitive segment of the Colorado River, provide an opportunity for cooperation among the stakeholders to investigate, develop, and implement a program that contributes to, and enhances

⁴ Corix is the owner/applicant for the wastewater treatment permit at the McKinney Roughs Park location.

these goals for all parties, the communities, and the environment in which their desired ecological paradise can survive and thrive.

Prayer

Environmental Stewardship respectfully requests that the TCEQ, the Applicant, and other interested parties take notice of the filing of these comments. Environmental Stewardship respectfully requests that, upon final decision in this action, TCEQ:

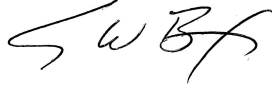
- (1) recognize the need to take special precautions in this sensitive segment of the Colorado River by requiring that the Applicant, in cooperation with the Lost Pines Groundwater Conservation District (District), to plan, install, maintain, and continuously operate a well monitoring network in this segment of the river to provide data and information to measure the quality and quantity of water exchanged between the river, alluvial aquifer, and other aquifers in compliance with such laws and rules of that govern such management practices in the District;
- (2) recognize the need to take special precautions relative to any research or commercial boring practices in this segment of the river that may alter the flow or quality of the water of the river and connected aquifers in a way that degrades such waters and the aquatic-life, recreational, and drinking water sources of the river and aquifers by requiring the Applicant to plan, install, maintain and continuously operate monitoring equipment, and to report such information regarding the impact of these actions on these resources to appropriate authorities;
- (3) conduct, prior to making a final decision regarding this permit, such biological assessment studies as are necessary to adequately assess and take remedial actions where needed to reverse the degradation of these segments of the river;
- (4) reexamine, prior to making a final decision regarding this permit, the anti-degradation reviews on the receiving waters (Tier 1 and 2) and the studies that underlay these reviews, to determine the current status of impaired fish and macrobenthic communities resulting from nitrogen, total phosphates, and other impairments in the segments 1428, including the level of PFAS contamination, and report these results to the public in a manner that makes such justifications transparent; and
- (5) recognize that per- and polyfluoroalkyl substance (PFAS) must be included in the chemical contaminants that the Applicant is required to measure and monitor in this segment of the river. Attachment 4.

Moreover, Environmental Stewardship disputes the classification of the discharge and facility as “minor” and will be asking EPA to evaluate that classification.

Finally, Environmental Stewardship disputes that an adequate regionalization evaluation or consideration of alternatives was performed by the applicant or TCEQ staff.

Thank you for your consideration. If you have any questions regarding these comments, please feel free to contact me.

Respectfully submitted,



Steve Box
Executive Director
Environmental Stewardship
Executive.Director@envstewardship.org

ATTACHMENT 1 - ISSUES LIST

ATTACHMENT 2 - WATER QUALITY ASSESSMENT REPORTS: SUPPORTING EVIDENCE & TIMELINE

ATTACHMENT 3 - COLORADO RIVER & CARRIZO WILCOX INTERSECTION WITH LOCATION OF CORIX AND GAPPED BASS OUTFALLS, AND GAPPED BASS SPRAYFIELD IN SECTION 1428 OF THE COLORADO RIVER

ATTACHMENT 4 - PFAS SURFACE WATER MONITORING REPORT

CC: Mr. Hunter Brauer, Lead Civil Engineer, The Boring Company (TBC), 725-279-8632
Gapped Bass LLC., 130 Walker Watson Road, Bastrop, Texas 78602

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Garrett Arthur, Office of Public Interest Counsel, TCEQ garrett.arthur@tceq.texas.gov

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Senator Charles Schwertner, District 5 Charles.Schwertner@senate.texas.gov

Representative Stan Gerdes, District 17 Stan.Gerdes@house.texas.gov

Elvis Hernandez, President, Lost Pines Groundwater Conservation District

lpgcd@lostpineswater.org

Trey Job, Assistant City Manager, City of Bastrop tjob@cityofbastrop.org

Environmental Stewardship is a nonprofit organization whose purposes fall under the following categories: Public Policy - Aiming to protect, conserve, restore, and enhance the earth's natural resources in order to meet current and future needs of the environment and humans; Science & Ecology - Gathering and using scientific information to restore and sustain ecological services provided by environmental systems; and Outreach & Education - Providing environmental education and outreach that encourages public stewardship. We are a Texas nonprofit 501(c) (3) charitable organization. For more information visit our website at <http://www.environmental-stewardship.org/>.

ATTACHMENTS 1-4

to

Environmental Stewardship's comments to TCEQ regarding Gapped Bass LLC/The Boring Company's wastewater permit application WQ0005397000

ATTACHMENT 1 - ISSUES LIST

**ATTACHMENT 2 - WATER QUALITY ASSESSMENT REPORTS: SUPPORTING
EVIDENCE & TIMELINE**

**ATTACHMENT 3 - COLORADO RIVER & CARRIZO WILCOX INTERSECTION
WITH LOCATION OF CORIX AND GAPPED BASS OUTFALLS,
AND GAPPED BASS SPRAYFIELD IN SECTION 1428 OF THE
COLORADO RIVER**

ATTACHMENT 4 - PFAS SURFACE WATER MONITORING REPORT

ATTACHMENT 1

ISSUES LIST

ISSUES, OBJECTIONS AND CONCERNS WITH THE APPLICATION OF GAPPED BASS L.L.C. FOR PERMIT APPLICATION WQ0005397000

BY ENVIRONMENTAL STEWARDSHIP

10 March 2023

I. COMPLETENESS, ACCURACY AND COMPLIANCE OF THE APPLICATION WITH TEXAS LAW, TCEQ RULES AND APPLICATION REQUIREMENTS

1. The Application fails to adequately assure that the applicant has the operational control required of operators, given the clear responsibilities identified in the Industrial Administrative Report of the Boring Company to pay for permit fees, report violations of the permit, and to control of other management decisions over the operations. Moreover, there is a clear relationship of the Boring Company to Gapped Bass with Gapped Bass clearly responsible to the Boring Company.
2. The Application fails to adequately identify a proper basis for its determination that the facility and discharge are minor for purposes of referral of the application to EPA. ES does not believe GB can prove or support its burden of proof on this issue.
3. The Initial¹ Application fails to adequately demonstrate compliance with all applicable facility design and management requirements, including but not limited to:
 - a. The owner and location of any sludge disposal site is not identified, See, Item 10, subsection h, Owner of sewage sludge disposal site of the Industrial Administrative Report. 11 c indicates sewage sludge is not disposed of onsite but does not give location or carrier.
 - b. That there will be adequate testing of the sludges to assure the sludges will not contain toxic, hazardous constituents and will not be industrial or hazardous wastes.
 - c. The location and management procedures for sludge created at the facility to assure prevention of the following were not identified:
 - i. ground or surface water contamination
 - ii. the attraction of flies, mosquitos and other insects that could be carriers of disease, or
 - iii. odors or other nuisance conditions.
 - d. All constituents of its wastewaters from industrial and municipal sources have not been identified.
 - i. Applicant has not completed WORKSHEET 2.0, POLLUTANT ANALYSES REQUIREMENT, even though the applicant frequently and consistently cites disposal of treated waste to the Colorado River as the option being requested as a disposal method in the TPDES Permit application². **Worksheet 2.0 is required for all applications submitted for a TPDES permit. Worksheet 2.0 is not required for applications for a permit to dispose of all wastewater**

¹ Some of the deficiencies listed have been cured as a result of TCEQ deficiency letters but are listed here to demonstrate the pattern of omission, obfuscation, and lack of compliance with, or knowledge of, existing laws and regulations.

² see Introduction: Phase 1 will authorize the land application or discharge to the Colorado River of up to 22,500 gallons per day (GPD) of treated industrial and domestic wastewater.

ATTACHMENT 1 - ISSUES LIST

- by land disposal or **for discharges solely of storm water** associated with industrial activities.
- ii. Applicant does not intend to SOLEY use land disposal for its treated wastewater comingled with domestic waste. Applicant is also requesting permit to dispose into the Colorado River³,
 - iii. Applicant does not adequately demonstrate that the purpose of comingling of industrial and domestic wastewater **is not to dilute** the concentration of industrial contaminants before discharge. ["the solution to pollution is not dilution".]
 - iv. Applicant does not intend to use wastewater impoundments⁴ (lagoons or ponds) to control wastewater when land application is not available. Applicant needs to be required to have impoundments or containments rather than depending on discharge to Colorado River.
- e. The facility and operations have not been designed in sufficient detail to allow proper evaluation of the proposed treatment, storage, and discharge facilities to assure protection of ground and surface waters.
 - f. The location, testing and procedures for the management of run-off waters and other waters associated boring spoils are not identified.
 - g. The location or management of wastewaters during times of frozen ground, when soils are saturated, or under other conditions when wastewater cannot be applied to the land or discharged, given that the application states that there will be no storage of wastewaters have not been identified.
 - h. The operator has not demonstrated adequate experience with the siting, design and operations for the storage, treatment, application, and discharge facilities and with the monitoring, recording and reporting requirements for the management of the wastewater to assure compliance with the Texas laws and regulations.
 - i. The Application does not demonstrate that it was prepared by a qualified person, one who is competent and experienced in the field to which the Application relates and thoroughly familiar with the operation or project for which the Application is made. (30 TAC §305.45(a) (8)).
 - j. The Application does not demonstrate that there will be adequate monitoring and reporting to detect violations of permit limitations and of state water quality and use standards due to the multiple sources of contaminants reaching the River from direct surface discharges, storm water runoff and groundwater discharges from the land application. Applicant has not adequately completed the following:
 - i. Section 4. Well and Map Information (page 33): c: Groundwater monitoring wells or lysimeters are /will be installed around the land application site or wastewater ponds. **YES, should be checked**⁵.
 - ii. Section 6. Laboratory Accreditation and Certification needs to be completed.
 - iii. Section 7. Effluent Monitoring Data needs to be completed.

³ See Section 7 (a) Other (e.g., portable toilets) , specify and Complete Item 7.b: On-site treatment and disposal through sprayfields in the interim, eventually to be routed to the Colorado River

⁴ Section 3. Impoundments, Applicant has checked "no".

⁵ If yes, provide the existing/proposed location of the monitoring wells or lysimeters on the site map attached for Item 4.a. Additionally, attach information on the depth of the wells or lysimeters, sampling schedule, and monitoring parameters for TCEQ review, possible modification, and approval.

ATTACHMENT 1 - ISSUES LIST

- iv. Section 8. Pollutant Analysis will need to be completed within 2 years of operations.
- k. The Application does not demonstrate that there will be adequate record keeping procedures and adequate duration of maintaining such records of constituents in the wastewaters and application rates to assure that long-term impacts of the land application can be evaluated.
- l. The Application does not demonstrate that the Operator will have sufficient property interest in all locations of wastewater treatment, application, routing and discharge to assure control of all proposed activities.
- m. The Application does not demonstrate that the location of all proposed activities will comply with all applicable location standards, buffer requirements and other requirements for
 - i. nearby schools, hospitals, churches, or homes,
 - ii. known faults, oil or gas wells, water wells, springs, seeps, surface water groundwater recharge zones or features, flood plains, archeological and historic sites or wetlands and
 - iii. the discovery of faults, groundwater recharge features, oil or gas wells, water wells and archeological and historic artifacts during site preparations for or construction at the wastewater facilities, and
 - iv. the presence of endangered or threatened species or habitat or of critical habitat for such species.
- n. The Application does not demonstrate that there will be adequate facilities or operations to prevent access to wastewaters facilities, ponds or land application areas by feral pigs and other animals that could use access to contact the wastewaters or to disturb the soils or vegetation at the land application sites or the liners of ponds. .
- o. The Application does not demonstrate that there will be adequate facilities or operations to prevent nuisance conditions.
- p. The Application does not demonstrate that Gapped Bass will report to TCEQ and local governments its violations of the permit, as well as upsets or accidents at the site, or creation of odors or other nuisance conditions.
- q. The Application does not demonstrate that there are adequate descriptions of the location and extent of land application sites and discharge point(s) to assure enforcement of the Permit by federal, state and local governments.
- r. The Application does not demonstrate that Gapped Bass has adequate knowledge of requirements of Texas laws, and regulations applicable to the facility and activities, to assure compliance with such laws and regulation and any permit issued give the history includes citations by TCEQ and TXDOT, including,
 - i. The Boring Company construction of a driveway at an unsafe location after TXDOT advised the Company of that issue,⁶ and

⁶ It is Environmental Stewardship's understanding based on a report from Bloomberg . . . that after a year of demanding exceptions, TXDOT legal had to threaten to barricade the entrance to get the Boring Company to submit a safe plan and . the violation by the Boring Company continue to this day, with and April 25th, 2022 TXDOT email threatening to barricade their driveway. See, <https://www.bloomberg.com/news/articles/2022-06-15/elon-musks-boring-co-is-feuding-with-texas-over-a-driveway?srnd=technologyvp>

ATTACHMENT 1 - ISSUES LIST

- ii. The Boring Company moved six families into mobile homes on the site, without an adequate septic system or other wastewater management system.⁷
- iii. The Boring Company⁸ pressured Bastrop County officials to approve numerous permits at breakneck speed — even as The Boring Co. was being cited for two code violations and issued three warnings of noncompliance.

II. PROPER PUBLIC NOTICE AND OPPORTUNITY FOR PUBLIC COMMENTS

The Application fails to demonstrate compliance with all applicable notice requirements, including but not limited to

- i. The failure of the notice of application and intent to provide the required information on the potential discharge location and routes with sufficient specificity to provide the public, local governments, the Texas Parks and Wildlife Department, and EPA with notice of potential locations of discharges to the Colorado River or its tributaries from surface or groundwater discharges resulting from the operation of the proposed treatment facility.
- ii. The failure to identify all landowners who will be affected and must be provided with proper notice
- iii. The failure to assure proper and timely notice by newspapers.

⁷ It is Environmental Stewardship's understanding based on a report from the Austin Business Journal that the Boring Company simply piped the wastewaters into a legacy system that had been there for an old cabin and was not adequate for the six mobile homes. See <https://www.bizjournals.com/austin/news/2022/02/28/boring-co-bastrop-warehouse-facility-residences.html>.

⁸ It is Environmental Stewardship's understanding based on a report from the San Antonio Express Article that “documents also reveal that the companies have pressured Bastrop County officials to approve numerous permits at breakneck speed — even as The Boring Co. was being cited for two code violations and issued three warnings of noncompliance. On June 22 of this year, then-county engineer Robert Pugh complained in a letter to Bastrop County Commissioner Clara Beckett about the heavy demands both companies had placed on the county’s Development Services and engineering departments.” Pugh wrote that staff had been “regularly hounded” by Boring Co. and Starlink employees and consultants to “expedite and approve permit applications that are incomplete and not in compliance with the Commissioners Court (CC) regulations.” In an email dated March 1, 2022, Pugh, the county engineer at the time, told The Boring Co.’s director of business operations, Paul Gentsch, that inspectors discovered the company had built employee housing on the property without proper septic- tank disposal. He directed the company to fix the problem within 60 days. In another email to Gentsch, also in March, Pugh noted several problems county officials found during an inspection of the property on Feb. 24. They included a discrepancy between the number of houses the company said would be located on the property and the number actually built; an RV and two trailers that weren’t in the original design plans; and septic holding tanks that a contractor was servicing without a legally required permit. County inspectors also observed a cement truck being hosed down in a right-of-way ditch, in violation of a Texas Commission on Environmental Quality regulation, according to an email. “In sum, priority needs to be given to bringing OSSF (on-site septic facility) into compliance, and all site plans submitted need to be consistent, showing all structures, OSSF fields, building locations and roadway locations and configurations,” Pugh wrote. But the company still hadn’t resolved the septic tank problem as of May 17, county officials said in a letter to The Boring Co. They warned that continued use of unauthorized holding tanks could result in a Class C misdemeanor charge, fines and court costs. Annie Blanks , San Antonio Express-News Dec. 16, 2022, Updated: Dec. 16, 2022, 2@05 p.m.

III. IMPACTS OF WASTEWATER APPLICATION ON GROUND WATERS.

The Application fails to adequately demonstrate that the land application of wastewaters and related operations will not cause pollution of groundwaters. The contaminants in the waste waters applied will move into the Colorado River Alluvium and Calvert Bluff, Simsboro, and Hooper Aquifers; aquifers which provide drinking and irrigation water to residents all along this segment of the river.

- 1) The Application has not properly and adequately characterized the aquifers, perched waters or other groundwater formation below the areas of wastewater application. ES does not believe GB can prove or support its burden of proof on this issue.
- 2) The Application has not adequately identified the location of all springs, seeps, recharge features, water wells, oil or gas wells, exploratory wells, or other wells in the area of its proposed activities.
- 3) The Application has not adequately demonstrated that all public and private water wells, springs, seeps, stock ponds, or other sources of water supply for domestic or agricultural uses within the appropriate regulatory distance in state law have been adequately identified and accurately located.
- 4) The Application has not adequately demonstrated that the rate of application of wastewaters for each area of application is appropriate given the different soils and groundwater conditions.
- 5) The Application has not demonstrated that there will be proper planting and maintenance of an appropriate cover crop(s) for the rate of application of wastewaters at each application sites.
- 6) The Application does not adequately identify the contaminants that are expected to be present in the pre-treated wastewater, or that are expected to be present in the wastewater being applied, including PFAS compounds (see ATTACHMENT 3) or how those contaminants will be removed and disposed of by other means. Further, ES does not believe GB can prove or support its burden of proof on this issue.
- 7) The Application does not adequately identify nutrients, such as nitrogen and phosphorous compounds, that are known to be above desired levels in this segment of the river, and how those compounds will be treated and removed from the wastewater applied and/or directly discharged. Further, ES does not believe GB can prove or support its burden of proof on this issue.
- 8) The Application does not adequately identify drilling fluids as a source of contaminants that will be a component of the wastewater to be treated, even-though it is known that it is the intent to conduct boring operations on the properties. Further, ES does not believe GB can prove or support its burden of proof on this issue.
- 9) The Application does not adequately identify the components of drilling fluids that will be contaminants that will be in the wastewater being treated, nor how those compounds will be

ATTACHMENT 1 - ISSUES LIST

treated and removed from the wastewater being applied and/or directly discharge. Further, ES does not believe GB can prove or support it burden of proof on this issue.

- 10) The application has not adequately demonstrated that its proposed treatment facilities can or will treat the wastewaters sufficient to meet the limits for protection of ground and surface water as a result of the land application of the wastewaters.
- 11) The Application has not adequately demonstrated that there will be the required inspection and maintenance activities for the wastewater application equipment, pumps, lines, and discharge ports to assure that the equipment will not fail or result in application rates in violation of those proposed in the Application, or result in ponding of wastewater, or discharge of wastewater to areas not authorized.
- 12) The Application has not adequately demonstrated that there has been or will be adequate pre-application monitoring of the quality of the ground waters to assure that the required monitoring of ground waters after application will identify any contamination from the land application, a concern of significant importance since it is evident that land application has already begun to occur at the site. Further, ES does not believe GB can prove or support it burden of proof on this issue.
- 13) The Application has not demonstrated that there will be adequate monitoring, proper location and depths for groundwater monitoring, or the recording and reporting of monitoring detection of groundwater contamination.
- 14) The Application has not adequately identified the chemical constituents and physical parameters that will be measured and monitored during pre-application and during application of wastewater at the site, including nitrogen, phosphates, per- and polyfluoroalkyl substances (PFAS), and pharmaceuticals.
- 15) Thus, the Application has not adequately demonstrated that the application of wastewaters will not contaminate ground waters over time? Further, ES does not believe GB can prove or support it burden of proof on this issue.
- 16) The Application does not adequately demonstrate that the applicant has developed a plan to manage produced groundwater from boring operations in a manner that avoids waste of groundwater.
- 17) The Application does not adequately demonstrate that the applicant has developed a plan to manage produced groundwater from boring operations in a manner that avoids nuisance pools of standing water and percolation of potentially contaminated water into the underlying alluvium and aquifers. Further, ES does not believe GB can prove or support it burden of proof on this issue.
- 18) The Application does not adequately demonstrate that the applicant has developed a plan to store, dispose of, and otherwise manage spoils from boring operations in a manner that avoids runoff of contaminated stormwater from the property into the Colorado River.

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- 19) The Application does not adequately demonstrate that the applicant has investigated, understands, and has developed a plan to avoid or mitigate the impacts of boring through the Colorado Alluvial Aquifer on the Colorado River without diminishing or otherwise damaging the flow and water quality of the aquifer and/or river. Further, ES does not believe GB can prove or support its burden of proof on this issue.
- 20) The Application does not adequately demonstrate that the facilities proposed are adequate to treat and dispose of domestic wastewater from additional Phase 1 and Phase 2 Project Awesome housing development recently revealed and not discussed in the application.
 - i) Is the sprayfield adequate to handle the additional wastewater from proposed future developments.
- 21) The Application does not address how industrial and domestic wastewater from Space X, Starlink, and other associated companies will be managed, treated, and disposed of.

IV. IMPACTS OF WASTEWATER APPLICATION ON SURFACE WATER QUALITY.

The Application fails to adequately demonstrate that the operations will not cause pollution of surface water or comply with water quality standards for exception aquatic life use designation for the Colorado River. The Colorado River, as it runs through Bastrop County, is primarily a gaining stream as it is recharged by groundwater flowing from the Carrizo-Wilcox Aquifer group by way of the Colorado Alluvial Aquifer (CAA), and application of treated wastewater over the river alluvium and the Calvert Bluff, Simsboro, and Hooper Aquifers underlying the disposal site has the high probability of contaminating the river unless the highest water quality treatment technology available are installed by the applicant. The Application fails to demonstrate that the technology to be used is the best-available-technology for treating the wastewater being discharged and will not further degrade the water quality or aquatic use standards for this segment of the river. Further, ES does not believe GB can prove or support its burden of proof on this issue.

The Geological Atlas of Texas, Austin shows that the site for land application overlies the alluvial aquifer along the Colorado River (Qal - Alluvium, and Qt Fluvial Terrace) and is near the outcrops of the Calvert Bluff, Simsboro, and Hooper aquifers. The alluvial aquifer exchanges water with the Colorado River and with underlying aquifers.

According to the Groundwater Availability Model (GAM), the site of the proposed land application is underlain by 25 to 50 feet of alluvium. The alluvium is underlain by the Calvert Bluff Aquifer.

The water discharged to the proposed land application areas would be applied directly above the alluvial aquifer. Thus, any contaminants in the applied water may be transported to the Colorado River via the Colorado Alluvial Aquifer (CAA).

PFAS compounds have been identified in the Colorado River at the Webberville Boat Launch, Onion Creek, Gilliland Creek, and Decker Creek (Segment 1428) above this site. The land application and direct discharges of waste waters will likely include PFAS that add to the current

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loading of such contaminants in the river. PFAS compounds have been identified in Wilbarger, Big Sandy, Piney, Alum creeks, and the Colorado River at Smithville below this site. See ATTACHMENT 3.

Moreover:

1. The Application has not adequately demonstrated that all applicable state water quality standards will be met in the Colorado River from discharge of contaminated groundwaters to the river. No dye tracer studies or other studies or discharge from the aquifers below the land application areas have been done to determine the nature of the alluvial and fluvial terrace deposits in order to describe and quantify the connectivity between Colorado River and the Carrizo-Wilcox Aquifer group. Further, ES does not believe GB can prove or support its burden of proof on this issue.
2. The Application has not adequately demonstrated compliance with all applicable anti-degradation requirements that may be violated due to the discharge of contaminated groundwaters. Further, ES does not believe GB can prove or support its burden of proof on this issue.
3. The Application has not adequately demonstrated that storm water ponds, berms or other controls are adequately located, sized, and operated, given recent increases in storm events, to avoid run on to the land application areas, or other areas of wastewater storage, processing or treatment and then run off to surface waters.

V. IMPACTS OF DIRECT WASTEWATER DISCHARGES TO THE COLORADO RIVER ON SURFACE WATER QUALITY.

The application does not adequately provide sufficient details on timing and use of surface water discharges or treatment technologies to assure protection of the water quality in the receiving segment of the Colorado River, a segment designated for Exceptional Aquatic Life Uses. Further, ES does not believe GB can prove or support its burden of proof on this issue.

1. The Application has not adequately demonstrated that all applicable state water quality standards will be met in the Colorado River from discharge.
2. The Application has not adequately demonstrated that all applicable technology standards will be met.
3. The Application has not adequately demonstrated that there will be adequate provisions for the monitoring, recording, and reporting of constituents in the discharge, or violations of the permit or water quality standards during normal, start-up or upset conditions.

Environmental Stewardship is concerned whether Segment 1428 of the Colorado River fully complies with Texas Water Quality Use standards for Aquatic-Life, Recreational, and Drinking Water uses.

1. Whether the evaluation of impacts properly considers current conditions and complies with applicable regulations to ensure the draft permit is protective of

ATTACHMENT 1 - ISSUES LIST

water quality, including utilizing accurate assumptions and inputs, e.g., proper evaluation of the current state of pollutants in and impairments of the Colorado River and its tributaries downstream of the discharge in a manner that considers the total loading on the river.

- a. Whether the impacts of the explosion of gravel mining operations and associated stormwater permits in this segment of the river have been properly considered and enforced relative to the silt load being deposited into the river.
- b. Whether the Executive Director's antidegradation review was accurate, e.g., proper evaluation of the current state of pollutants in, and impairments of, the Colorado River downstream of the discharge, proper use of the historic measuring period for evaluation of degradation and proper evaluation of the degradation standard:
 - i. Whether impairments in Segment 1428, AUID: 1428_0 have been timely field studied using biological metrics, monitored, and assessed by TCEQ, based on TCEQ, TPWD, or LCRA data collected since originally assessed in 2006 to determine if the segment should be on the 303(d) list based on impairment of fish and microbenthic communities, nitrogen, and phosphorus, or whether removal of these causes for impairment were justifiably based on best-available science.

VI. OTHER CONSIDERATIONS

1. Whether the burden of proof has rightfully been placed on the Applicant and the Commission to prove that concerns and issues brought up before the Commission are in accordance with the federal laws that have been delegated to the State.
2. Whether the Commission has been as transparent, as is necessary to provide the public adequately and fully with timely and visible notice of proposed actions and timely and efficiently provided the information and documents necessary for the public interest to be able to review and respond to such proposed actions without delays.

ATTACHMENT 2

WATER QUALITY ASSESSMENT REPORTS: SUPPORTING EVIDENCE & TIMELINE

Supporting evidence for issues raised by Environmental Stewardship in comments to TECQ regarding Gapped Bass/The Boring Company, and Corix/McKinney Roughs wastewater TPDES permit applications

SUMMARY

Fish and Macroenthic Communities have been TCEQ listed¹ as "impaired ... in water" as "TCEQ cause[s]" for concern in numerous Assessment Units (AUID) of Segment 1428 since before 2006² when they were carried forward from the previous assessment. Both are "use concerns" (CN³) based on "inadequate data (less than 4)" (ID). The methods of assessment for these parameters for Aquatic Life Use were listed in 2020 as "regional" and "qualitative", respectively.

These two biological parameters of concern that relate to aquatic life use have been carried forward for at least 17 years without having been further evaluated to determine whether to rate them as fully supporting (FS), nonsupport (NS), or no concern (NC).

Fish Community, as an Aquatic Life Use Method, and the lower segment of the Colorado River, were *delisted* from the July 7, 2022,⁴ TCEQ Water Quality Report⁵. Dissolved oxygen concerns in the upper segment of the Colorado river were also *delisted* from the same report.

NOTE: Segment 1428 was included in "*intensive biological and physical data collection activities conducted in 2004-2007*" and reported in 2008⁶. Aquatic habitat and use data were collected at 10 sites from Longhorn Dam to Wharton. Fifty (50) species of fish⁷ were collected in the entire lower basin.

Nutrient screening for Nitrate and Total Phosphate have been TCEQ listed as General Use "in water" "TCEQ cause" of concern based on the concentration levels that these compounds are found in water. (See Documents cited in footnotes 1 and 2). Neither have been carried forward from previous assessments. Both are "screening level concerns" (CS) based on adequate data (AD). The method of assessment for these General Use parameters have been by Nutrient Screening Levels. Orthophosphorus was listed in this group until 2020.

¹ 2020 Texas Integrated Report - Assessment Results for Basin 14 - Colorado River Basin, Segment 1428, page 183 of 242.

² 2006 Texas Water Quality Inventory - Basin Assessment Data By Segment, Segment 1428, Page 1 of 7; 2008 Texas Water Quality Inventory - Basin Assessment Data based on Segment (March 19, 2008) page 1 of 5; 2010 Water Quality Inventory: Assessment Results for Basin 14 - Colorado River (page 280 - 297).

³ From 2006 to 2008 CN was listed as "Concern for Near non-attainment" until changed in 2010 to "Use Concern".

⁴ TCEQ SFR-127, 2022 Guidance for Assessing and Reporting Surface Water Quality in Texas, was adopted July 7, 2022.

⁵ See: Timeline and Exhibits in Support of Evidence for Issues raised by Environmental Stewardship in comments to TCEQ regarding Gapped Bass/The Boring Company, and Corix/McKinney Roughs wastewater TPDES Permit Applications and Draft Permits.

⁶ Colorado and Lavaca Rivers and Matagorda and Lavaca Bays Basin and Bay Expert Science Team (CL-BBEST) Environmental Flow Regimes Recommendations Report, March 1, 2011.

⁷ Surface Water Quality Monitoring Procedures, Volume 2: Appendix B: Greater than or equal to 52 fish species are needed to support the exceptional aquatic-life use standard for fish (Metric for Ecoregion 30 (Table B.6.) and greater than or equal to 42 species for Ecoregion 31 Table B.7.).

Both have been chemical parameters of concern for at least 17 years but continue to be assessed and included because the data indicates an ongoing concern that is short of being characterized as nonsupport (NS) that would trigger a Category 5c response. The Nitrate and Total Phosphate concerns in lower segment of the Colorado River were also *delisted* from the July 7, 2022, TCEQ Water Quality Report.

Category 5c concerns, like bacteria in this Segment, are included on the 303(d) list and require additional data or information to be collected and/or evaluated for one or more parameters before a management strategy, normally TMDLs for chemical parameters, is selected.

CONCLUSIONS

Fish and Macrobenthic Communities have been a TCEQ cause based on impairment in water concerns that have not been investigated for at least 17 years by collecting biological field data to determine whether to rate them as fully supporting (FS), nonsupport (NS), or no concern (NC).

Without a holistic biological assessment of these biological indicators of the status of aquatic life use, there is no ability for TCEQ, or the public, to determine whether management strategies for constituents in discharges to this segment of the river -- such as nitrogen and total phosphate -- are degrading the water quality in this Colorado River segment to an extent that the aquatic life use has also been degraded, or not degraded.

The Executive Director has asserted,

"no significant degradation of water quality is expected in the Colorado River below Lady Bird Lake/Town Lake which has been identified as having exceptional aquatic life use",

That assertion for both the Tier 1 and Tier 2 antidegradation review cannot be reliably concluded given the uncertainty in the data and the agency's levels of evaluations of the conditions in the River below Lady Bird Lake/Town Lake.

Issues Raised: To be included in issue lists in comments on Gapped Bass/The Boring Company, and Corix/McKinney Roughs wastewater TPDES permit applications.

- a) Whether the evaluation of impacts properly considers current conditions and complies with applicable regulations to ensure the draft permit is protective of water quality, including utilizing accurate assumptions and inputs, e.g., proper evaluation of the current state of pollutants in and impairments of the Colorado River downstream of the discharge in a manner that considers the total loading on the river.
- b) Whether the Executive Director's antidegradation review was accurate, e.g., proper evaluation of the current state of pollutants in, and impairments of, the Colorado River downstream of the discharge, proper use of the historic measuring period for evaluation of degradation and proper evaluation of the degradation standard:
 - a. Whether impairments in Segment 1428, AUID: 1428_0 have been timely field studied using biological metrics, monitored, and assessed by TCEQ, based on TCEQ, TPWD, or LCRA data collected since originally assessed in 2006 to determine if the segment should be on the 303(d) list based on impairment of fish and microbenthic communities, nitrogen, and phosphorus or if the removal of these causes for impairment were justifiably based on best-available science.

**Timeline for Listing and Assessment of Colorado River (Basin 14)
Segment 1428
-- impairments listed since 2006 in the Texas Integrated Reports --**

SUMMARY

Fish Community:

- 2006 Concern for Near non-attainment (CN)
- 2010 Use Concern (CN)
- 2022 **Fish Community as an Aquatic Life Use Method was Delisted (July 7, 2022)**

Macrobenthic Community:

- 2006 Concern for Near non-attainment (CN)
- 2010 Use Concern (CN)
- 2006 Colorado River, lower segment
- 2008 Walnut Creek added
- 2022 **Colorado River delisted from this Aquatic Life Use Method (July 7, 2022)**

Dissolved Oxygen:

- 2020 New Method Added
Colorado River, Walnut Creek to Longhorn Dam (CS) (May 31, 2020)
- 2022 **Colorado River, Walnut Creek to Longhorn Dam delisted (July 7, 2022)**

Habitat:

- 2020 New Method Added
Walnut Creek

Nitrate:

No. Listings

- | | | |
|------|---|--------------|
| 2006 | 1 | |
| 2008 | 2 | |
| 2010 | 3 | |
| 2020 | 6 | May 31, 2020 |
| 2022 | 5 | July 7, 2022 |
- Colorado River lower segment delisted**

**Timeline for Listing and Assessment of Colorado River (Basin 14)
Segment 1428
-- impairments listed since 2006 in the Texas Integrated Reports --**

SUMMARY (continued)

<u>Orthophosphorus:</u>	<u>No. Listings</u>
2006	2
2008	2
2010	3
2020	0

<u>Total Phosphates:</u>	<u>No. Listings</u>
2006	1
2008	2
2010	3
2020	2
2022	1

May 31, 2020

July 7, 2022

Colorado River lower segment delisted

<u>Bacteria Single Sample:</u>	<u>No. Listings</u>	<u>Concern</u>
2006	1	
2008	2	CN
2010	1	CN
	1	NS
2020	0	May 31, 2020
2022	0	July 7, 2022

<u>Bacteria Geomean:</u>	<u>No. Listings</u>	<u>Concern</u>
2006	1	
2008	2	CN
	2	NS
	4	5c
2010	3	CN
	5	5c
2020	3	CS May 31, 2020
	3	4a May 31, 2020
2022	2	CN July 7, 2022
	4	4a July 7, 2022

**Timeline for Listing and Assessment of Colorado River (Basin 14)
Segment 1428
-- impairments listed since 2006 in the Texas Integrated Reports --**

2006 - Report from TCEQ website (see attached Exhibit 4)

- **Assessment Data (7 TCEQ Causes Listed)**

- Fish Community Concern for Near non-attainment (CN) Carry Forward
1428_01 Colorado River, Lower end of segment to Gilleland Creek

- Macrobenthic Community- Concern for Near non-attainment (CN) Carry Forward
1428_01 Colorado River, Lower end of segment to Gilleland Creek

- Nitrate Concern for Screening level (CS) No
1428_01 Colorado River, Lower end of segment to Gilleland Creek

- Orthophosphorus Concern for Screening level (CS) No
1428_01 Colorado River, Lower end of segment to Gilleland Creek
1428_02 Colorado River. Gilleland Creek to Walnut Creek

- Total Phosphorus Concern for Screening level (CS) No
1428_01 Colorado River, Lower end of segment to Gilleland Creek

- E. coli Non-Supporting (NS), Impaired Category 5c No
1428_03 Walnut Creek to Longhorn Dam

**Timeline for Listing and Assessment of Colorado River (Basin 14)
Segment 1428
-- impairments listed since 2006 in the Texas Integrated Reports --**

2008 - Reports from TCEQ website (see attached Exhibit 3)

- **Integrated Report - Not Available on TCEQ website**

- **Assessment Data - 20 TCEQ Causes Listed**

- Fish Community Concern for Near non-attainment (CN) Carry Forward
1428_01 Colorado River, Lower end of segment to Gilleland Creek

- Macrobenthic Community- Concern for Near non-attainment (CN) Carry Forward
1428_01 Colorado River, Lower end of segment to Gilleland Creek
1428B_04 Walnut Creek, From Dessau Rd. upstream to MoPac/Loop 1

- Nitrate Concern for Screening level (CS) No
1428_01 Colorado River, Lower end of segment to Gilleland Creek
1428C_01 Gilleland Creek, From Colorado River upstream to Taylor Lane
1428C_02 Gilleland Creek, From Taylor Lane upstream to Old Hwy 20

- Orthophosphorus Concern for Screening level (CS) No
1428_01 Colorado River, Lower end of segment to Gilleland Creek
1428C_01 Gilleland Creek, From Colorado River upstream to Taylor Lane

- Total Phosphorus Concern for Screening level (CS) No
1428_01 Colorado River, Lower end of segment to Gilleland Creek

- Bacteria Single Sample Concern for near non-attainment (CN) No
1428_03 Colorado River, Walnut Creek to Longhorn Dam
Fecal coliform
1428C_01 Gilleland Creek, From Colorado River upstream to Taylor Lane

- Bacteria Single Sample Non-Supporting (NS), Impaired Category 5c No
1428B_05 Walnut Creek, From MoPac upstream to RR west of Loop 1
E. coli

- Bacteria Geomean Concern for near non-attainment (CN) No
1428B_04 Walnut Creek, From Dessau Rd. upstream to MoPac/Loop 1
E. coli
1428B_05 Walnut Creek, From MoPac upstream to RR west of Loop 1
E. coli

- Bacteria Geomean Non-Supporting (NS) No
1428_03 Colorado River, Walnut Creek to Longhorn Dam
Fecal coliform
1428C_01 Gilleland Creek, From Colorado River upstream to Taylor Lane
Fecal coliform

**Timeline for Listing and Assessment of Colorado River (Basin 14)
Segment 1428
-- impairments listed since 2006 in the Texas Integrated Reports --**

- Bacteria Geomean Non-Supporting (NS), Impaired Category 5c No
- 1428_03 Colorado River, Walnut Creek to Longhorn Dam
 E. coli
- 1428B_01 Walnut Creek, From Colorado River upstream to FM 969
 Fecal coliform
- 1428B_03 Walnut Creek, From old Manor Rd. upstream to Dessau Rd.
 Fecal coliform
- 1428C_01 Gilleland Creek, From Colorado River upstream to Taylor Lane
 E. coli

**Timeline for Listing and Assessment of Colorado River (Basin 14)
Segment 1428
-- impairments listed since 2006 in the Texas Integrated Reports --**

2008 - Reports from TCEQ (continued)

- **Water Bodies Evaluated**

- Colorado Below Town Lake Assessed in 2008 TWQS-Appendix A
- Walnut Creek Assessed in 2008 Presumption from
Flow Type
- Gilleland Creek Assessed in 2008 Presumption from
Flow Type

- **Colorado River Below Town Lake**

- Colorado River, Walnut Creek to Longhorn Dam Category 5c Bacteria
Not Carried Forward
- Walnut Creek Category 5c Bacteria Not Carried Forward
- Gilleland Creek Category 5c Bacteria Not Carried Forward

- **303(d) List**

- Bacteria Colorado River Category 5c First Listed 2006
- Bacteria Walnut Creek Category 5c First Listed 2006
- Bacteria Gilleland Creek Category 5c First Listed 1999

- **Water Bodies and Impairments Added to 303(d) List**

- None added for Segment 1428

- **Water Bodies and Parameters Removed from 303(d) List**

- None removed for Segment 1428

**Timeline for Listing and Assessment of Colorado River (Basin 14)
Segment 1428
-- impairments listed since 2006 in the Texas Integrated Reports --**

2010 - Report from TCEQ - 18 TCEQ Causes Listed, 4 Screening Level Concerns wo/Cause Listed (See Attached Exhibit 2)

- Fish Community (Regional) Use Concern (CN) Carry Forward
1428_01 Colorado River, Lower Segment to Gilleland Creek

- Macrobenthic Community (Qualitative) Use Concern (CN) Carry Forward
1428_01 Colorado River, Lower Segment to Gilleland Creek
1428B_04 Walnut Creek, From Dessau Rd. upstream to MoPac/Loop 1

- Nitrate Screening Level Concern(CS) No
1428_01 Colorado River, Lower Segment to Gilleland Creek
1428_02 Colorado River, Gilleland Creek upstream to Walnut Creek
1428C_01 Gilleland Creek, From CR upstream to Taylor Lane
1428C_02 Gilleland Creek, From Taylor Lane upstream to Old Hwy 20

- Orthophosphorus Screening Level Concern(CS) No
1428_01 Colorado River, Lower Segment to Gilleland Creek
1428_02 Colorado River, Gilleland Creek upstream to Walnut Creek
1428C_01 Gilleland Creek, From CR upstream to Taylor Lane

- Total Phosphorus Screening Level Concern(CS) No
1428_01 Colorado River, Lower Segment to Gilleland Creek
1428_02 Colorado River, Gilleland Creek upstream to Walnut Creek

- Bacteria Single Sample Screening Level Concern (CS) No
1428B_04 Walnut Creek, From Dessau Rd. upstream to MoPac/Loop 1

- Bacteria Single Sample Nonsupport (NS) No
1428B_05 Walnut Creek, From MoPac/Loop 1 upstream to RR. west of Loop 1

- Bacteria Geomean Screening Level Concern (CS) No
1428B_01 Walnut Creek, From Colorado River upstream to FM 969
1428B_02 Walnut Creek, From FM969 to Old Manor Rd.
1423B_03 Walnut Creek, From Old Manor Rd. upstream to Dessau Rd.

- Bacteria Geomean Nonsupport (NS), Category 5c No
5c: Additional data and information will be collected before a TMDL is scheduled
1428_03 Colorado River, Walnut Creek to Longhorn Dam
1428B_05 Walnut Creek, From MoPac/Loop 1 upstream to RR. west of Loop
1428C_01 Gilleland Creek, From CR upstream to Taylor Lane
1428C_03 Gilleland Creek, From Old Hwy 20 to Cameron Rd.

**Timeline for Listing and Assessment of Colorado River (Basin 14)
Segment 1428**

-- impairments listed since 2006 in the Texas Integrated Reports --

1428C_04 Gilleland Creek, From Cameron Rd to the spring source
2020 - Reports from TCEQ (see attached Exhibit 1)

May 31, 2020, Report (19 TCEQ Causes Listed)

- Fish Community (Regional) Use Concern (CN) Carry Forward
1428_01 Colorado River, Lower Segment to Gilleland Creek
- Macrobenthic Community (Qualitative) Use Concern (CN) Carry Forward
1428_01 Colorado River, Lower Segment to Gilleland Creek
1428B_04 Walnut Creek, From Dessau Rd. upstream to MoPac/Loop 1
- Nitrate Screening Level Concern(CS) No
1428_01 Colorado River, Lower Segment to Gilleland Creek
1428_02 Colorado River, Gilleland Creek upstream to Walnut Creek
1428C_01 Gilleland Creek, From CR upstream to Taylor Lane
1428C_02 Gilleland Creek, From Taylor Lane upstream to Old Hwy 20
1428C_03 Gilleland Creek, From Old Hwy 20 to Cameron Rd.
1428C_04 Gilleland Creek, From Cameron Rd to the spring source
- Total Phosphorus Screening Level Concern(CS) No
1428_01 Colorado River, Lower Segment to Gilleland Creek
1428_02 Colorado River, Gilleland Creek upstream to Walnut Creek
- Dissolved Oxygen Screening Level Concern(CS) No
1428_03 Colorado River, Walnut Creek to Longhorn Dam
- Bacteria Geomean Screening Level Concern(CS) Carry Forward
1428B_02 Walnut Creek, From FM969 to Old Manor Rd.
1428B_04 Walnut Creek, From Dessau Rd. upstream to MoPac/Loop 1
1428C_01 Gilleland Creek, From CR upstream to Taylor Lane Bacteria
Geomean Nonsupport (NS), Category 4a No
4a: ALL TMDLs have been completed and approved by EPA
1428B_05 Walnut Creek, From MoPac/Loop 1 upstream to Union Pacific
RR. south of McNeil Drive
1428C_03 Gilleland Creek, From Old Hwy 20 to Cameron Rd.
1428C_04 Gilleland Creek, From Cameron Rd to the spring source
- Habitat **New Method** Screening Level Concern(CS) Carry Forward
1428B_03 Walnut Creek, From Old Manor Rd upstream to Dessau Rd.

**Timeline for Listing and Assessment of Colorado River (Basin 14)
Segment 1428
-- impairments listed since 2006 in the Texas Integrated Reports --**

2020 - Reports from TCEQ (continued)

July 7, 2022, Report (14 TCEQ Causes Listed)

- **Macrobenthic Community (Qualitative)**

	Use Concern (CN)	Carry Forward
1428B_04	Walnut Creek, From Dessau Rd. upstream to MoPac/Loop 1	

- Nitrate

	Screening Level Concern(CS)	No
1428_02	Colorado River, Gilleland Creek upstream to Walnut Creek	
1428C_01	Gilleland Creek, From CR upstream to Taylor Lane	
1428C_02	Gilleland Creek, From Taylor Lane upstream to Old Hwy 20	
1428C_03	Gilleland Creek, From Old Hwy 20 to Cameron Rd.	
1428C_04	Gilleland Creek, From Cameron Rd to the spring source	

- Total Phosphorus

	Screening Level Concern(CS)	No
1428_02	Colorado River, Gilleland Creek upstream to Walnut Creek	

- Bacteria Geomean

	Use Concern(CN)	Carry Forward
1428B_02	Walnut Creek, From FM969 to Old Manor Rd.	
1428C_04	Walnut Creek, From Dessau Rd. upstream to MoPac/Loop 1	

- Bacteria Geomean

	Nonsupport (NS), Category 4a	No
4a: A state-developed TMDL has been approved by EPA or TMDL has been established by EPA for any water-pollutant combination.		
1428B_05	Walnut Creek, From MoPac/Loop 1 upstream to Union Pacific RR. south of McNeil Drive	
1428C_01	Gilleland Creek,	
1428C_03	Gilleland Creek, From Old Hwy 20 to Cameron Rd.	
1428C_04	Gilleland Creek, From Cameron Rd to the spring source	

- **Habitat**

	New Method Screening Level Concern(CS)	Carry Forward
1428B_03	Walnut Creek, From Old Manor Rd upstream to Dessau Rd.	

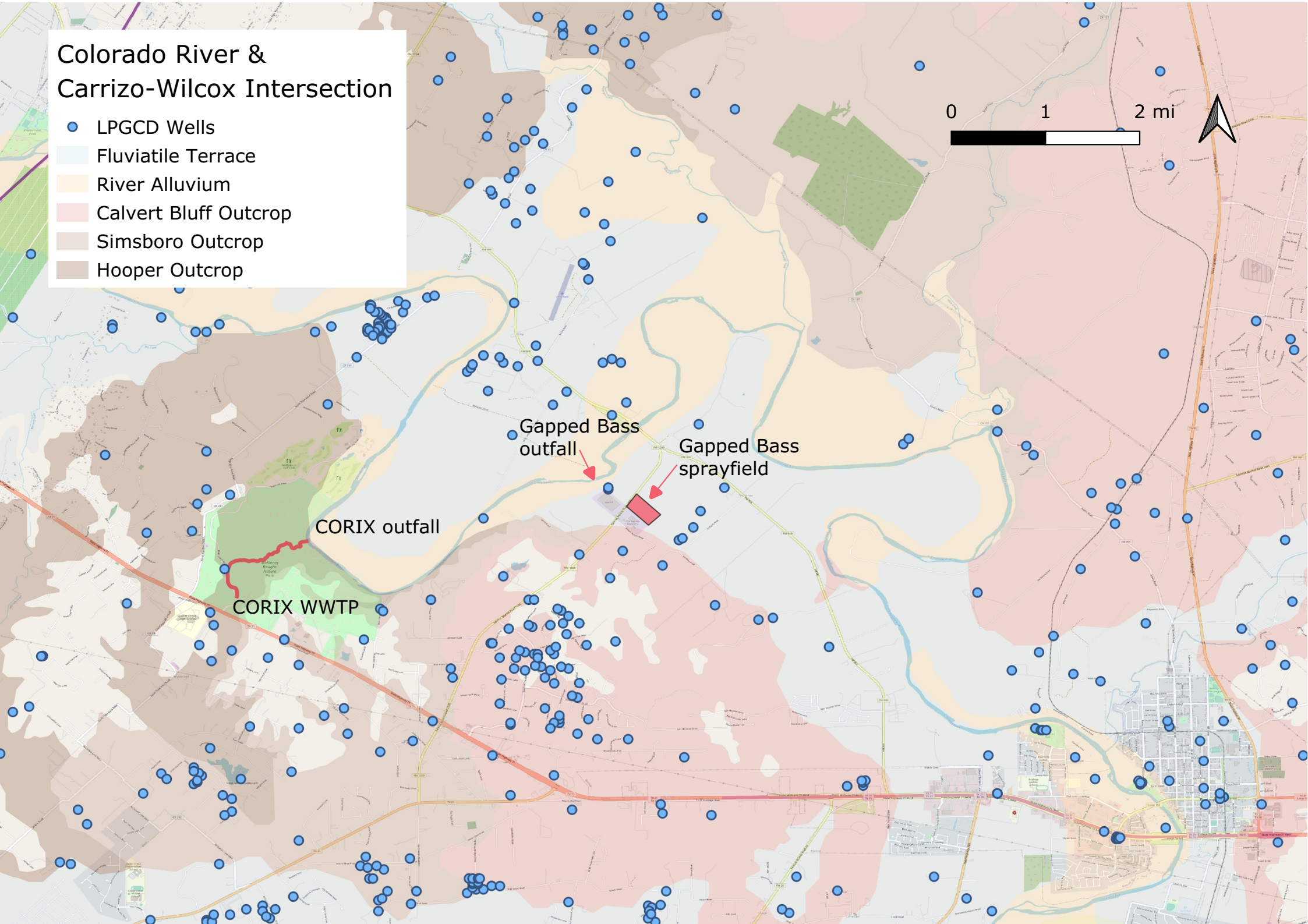
ATTACHMENT 3

**COLORADO RIVER & CARRIZO WILCOX
INTERSECTION WITH LOCATION OF
CORIX AND GAPPED BASS OUTFALLS,
AND GAPPED BASS SPRAYFIELD IN
SECTION 1428 OF THE COLORADO RIVER**

Colorado River & Carrizo-Wilcox Intersection

- LPGCD Wells
- Fluvial Terrace
- River Alluvium
- Calvert Bluff Outcrop
- Simsboro Outcrop
- Hooper Outcrop

0 1 2 mi



ATTACHMENT 4

**PFAS SURFACE WATER MONITORING
REPORT**

PFAS Contamination in Surface Water Samples taken from the Colorado River and tributaries in Bastrop County, December 2022

by

Molly O'Neil Fisher

for

Environmental Stewardship

02/11/23

Introduction

Environmental Stewardship (ES) is an environmental non-profit in the Bastrop, TX area which conducts environmental research to inform policy and decision-making in Texas. In December 2022, ES conducted a preliminary test of surface water contamination of per- and polyfluoroalkyl substances (PFAS) in the Colorado river and its tributaries. The goal of this study is to ascertain the existence of PFAS contamination and report upon the results to the proper authorities so judgments can be made about the state of our environment and catalyze discussion regarding plans to move forward in a regulatory sense.

PFAS are a widely employed industrial chemical group used to create fluoropolymer coatings and products that resist heat and water, such as non-stick cooking products, clothing, furniture, food packaging, adhesives, and wire insulation. These chemicals do not break down in the environment, rather they are persistent and bioaccumulate in fish and wildlife, and infiltrate soil and water. The nature of their composition and multifunctional use makes them environmentally pervasive and globally widespread. The nature of their composition and bioaccumulation capacity has led to discoveries of the compound in the blood of humans and animals (Domingo, 2019).

Definitive claims about the impact of long-term exposure to PFAS on human health cannot be made as research is currently rudimentary and ongoing (Fenton, 2021). However, the EPA released an updated drinking water Health Advisory¹ (HA) about PFAS, for which the results of this study have been framed upon. This new HA states that the advised level of exposure to PFOA and PFOS are .004 ppt² (ng/L) and .002 ppt (ng/L) respectively³. The EPA is a regulatory agency with enforcement authority. However, the agency has authorized most states by a delegation

¹ Health Advisories Explained: <https://www.epa.gov/sdwa/drinking-water-health-advisories-has>

² ppt, parts per trillion

³ EPA Notice of PFAS Health Advisory, Federal Register Vol. 87 Number 118, June 21, 2022, page 36848. <https://www.govinfo.gov/content/pkg/FR-2022-06-21/pdf/2022-13158.pdf>

process whereby a memorandum of agreement guides the state in implementing and enforcing federal regulations on a local level. States, however, can independently set limits and enforce limits. Texas Commission on Environmental Quality (TCEQ) has been delegated this authority but has not issued regulatory standards or advisories about PFAS. Therefore, it is necessary for the proper authorities at TCEQ to address the concerns brought forth in this study.

Methods

ES worked with Cyclopure labs for PFAS testing of water samples. All eleven samples discussed in this report were collected with a Cyclopure product called Water Test Kit Pro. These kits do not require the collecting and shipping of large water samples, rather water is filtered through Cyclopure’s patented filtration device DEXSORB®. This lab uses an isotope dilution method to determine the existence of 55 PFAS chemicals, including all listed in EPA health advisories. Cyclopure is not a certified lab, therefore these results serve as preliminary information and demand further inspection by a certified lab to be considered by state and federal regulatory agencies. For more information on Cyclopure’s patented technology and laboratory efficacy, please consult their website⁴.



Image 2: Sample Collection at Colorado River at Smithville (ES-4)



Image 1: Cyclopure Water Test Kit in Use at Decker Creek (ES-3)

⁴ More information about Cyclopure Water Test Kit and DEXSORB® technology can be found here: <https://cyclopure.com/product-information/>

Eleven samples were collected along the Colorado River and its tributaries in and around Bastrop County. Each sample location was publicly accessible from main roads and did not broach private property (Images 3-5). The directions for use outlined by Cyclopure were followed. Gloves were worn and about 250 ml of water was directly collected into the Cyclopure testing kit. Before collecting the sample from the site, the data card from the test kit was filled out with the appropriate information from the sample location. Sample collection was executed with precaution. The inside of the sample cup was not touched and the blue extraction filter at the bottom of the cup containing the DEXSORB® was not detached or disturbed.



Image 3: Entrance to Onion Creek (ES-1) sampling location



Image 4: Piney Creek (ES-7) Sampling Location



Image 5: Cedar Creek (ES-6) Sampling Location

Once all the location and sample data were recorded, water samples were collected directly into the Cyclopure sample cup. When taking the sample, the cup was faced up-stream with little to no disturbance of the river/stream bottom. Each water sample cup was filled to the 250 ml line and the lid was placed directly back onto the cup immediately after the collection of water. Once all collected water was filtered through the testing kit, which took roughly about 15-20 minutes depending on turbidity, they were sealed, labeled, and returned to Cyclopure labs for analysis.

Results

Environmental Stewardship, TX PFAS Testing Dec 2022						
Detects Highlighted in Yellow by Cyclopure						
Format part per trillion (ng/L); LOQ 1.0 ppt all PFAS, except Genx 2.0 ppt						
ES Name	Colorado River, Webberville	Big Sandy Creek	Piney Creek	Cedar Creek	Wilbarger Creek	Texas PFAS Regulations. EPA has set Health Advisory Levels for PFOA (0.004 ppt); PFOS (0.02); GenX (10 ppt) and PFBS (2,000 ppt). Texas Commission on Environmental Quality has not established PFAS drinking limits at this time. Per Cyclopure
ES Kit Number	Upstream (U)	ES-9	ES-7	ES-6	ES-8	
Sampling Location	Colorado River, Boat Ramp @ Webberville, TX	Bastrop, TX 78602 ES-9; BSC	Bastrop, TX 78602 ES-7; PINC	Bastrop, TX 78602 ES-6; WLC	Elgin, TX 78621 ES-8; WLC	
Filtered/Unfiltered	Unfiltered	Unfiltered	Unfiltered	Unfiltered	Unfiltered	
Sampling Date	9/16/22	12/17/22	12/17/22	12/17/22	12/17/22	
Order ID	wtk-22-00126	P-140680472	P-140680472	P-140680472	P-140680472	
PFBA	2.3	1.6	1.6	1.9	2.2	
PFPeA	3.9	4.4	< 1 ng/L	< 1 ng/L	8.4	
PFHxA	3.8	2.9	< 1 ng/L	< 1 ng/L	2.8	
PFHpA	1.9	< 1 ng/L	< 1 ng/L	< 1 ng/L	< 1 ng/L	
PFOA	2.7	2.1	< 1 ng/L	< 1 ng/L	1.8	
PFNA		< 1 ng/L	< 1 ng/L	< 1 ng/L	< 1 ng/L	
PFDA		< 1 ng/L	< 1 ng/L	< 1 ng/L	< 1 ng/L	
HFPO-DA (GenX)		< 2 ng/L	< 2 ng/L	< 2 ng/L	< 2 ng/L	
PFBS	1.9	1.1	1.2	< 1 ng/L	3.4	
PFHxS	5.1	< 1 ng/L	1.8	< 1 ng/L	< 1 ng/L	
PFOS	4.2	< 1 ng/L	< 1 ng/L	< 1 ng/L	< 1 ng/L	
Total PFAS (11 Compounds)		12.1	4.6	1.9	18.6	
Additional PFAS						
6:2 FTS		< 1 ng/L	< 1 ng/L	< 1 ng/L	< 1 ng/L	
FBSA		< 1 ng/L	< 1 ng/L	< 1 ng/L	< 1 ng/L	
PFHpS		< 1 ng/L	< 1 ng/L	< 1 ng/L	< 1 ng/L	
PFPeS		< 1 ng/L	< 1 ng/L	< 1 ng/L	< 1 ng/L	
Total PFAS (All Detected)	25.8	12.1	4.6	1.9	18.6	
ES Name	Colorado River, Bastrop	Alum Creek	Gilliland Creek	Onion Creek	Decker Creek	Colorado River, Smithville
ES Kit Number	Downstream (D)	ES-5	ES-2	ES-1	ES-3	ES-4 (54)
Sampling Location	Colorado River downstream of HWY 71 Bridge, Bastrop, TX	Smithville, TX 78957 ES-5; ALC	Manor, TX 78653 ES-2; GILC	Austin, TX 78617 ES-1; ONC	Austin, TX 78725 ES-3; DEC	Smithville, TX 78957 ES-54; CRS
Filtered/Unfiltered	Unfiltered	Unfiltered	Unfiltered	Unfiltered	Unfiltered	Unfiltered
Sampling Date	9/16/22	12/17/22	12/16/22	12/16/22	12/16/22	12/17/22
Order ID	wtk-22-00126	P-140680472	P-140680472	P-140680472	P-140680472	P-140680472
PFBA	1.9	2.1	2.4	4.8	3	7.8
PFPeA	2.8	2.6	10.3	12.4	3	12
PFHxA	3.1	3.5	6	13.9	2.1	12.7
PFHpA	1.5	1.1	1.7	8	1.2	5.1
PFOA	1.7	1.4	4.7	7.9	2	6.7
PFNA		< 1 ng/L	1.2	1.1	< 1 ng/L	1.6
PFDA		< 1 ng/L	< 1 ng/L	< 1 ng/L	< 1 ng/L	< 1 ng/L
HFPO-DA (GenX)		< 2 ng/L	< 2 ng/L	< 2 ng/L	< 2 ng/L	< 2 ng/L
PFBS	1.3	4.3	6.7	7.1	1.9	7.4
PFHxS	2.1	< 1 ng/L	2.1	37.5	1.4	16.2
PFOS	3	< 1 ng/L	2.2	53.4	1.9	12.2
Total PFAS (11 Compounds)		15	37.3	146.1	16.5	81.7
Additional PFAS						
6:2 FTS		< 1 ng/L	< 1 ng/L	1.8	< 1 ng/L	2.5
FBSA		< 1 ng/L	< 1 ng/L	1.4	< 1 ng/L	1.2
PFHpS		< 1 ng/L	< 1 ng/L	1.3	< 1 ng/L	< 1 ng/L
PFPeS		< 1 ng/L	< 1 ng/L	3.2	< 1 ng/L	1.5
Total PFAS (All Detected)	17.4	15	37.3	153.8	16.5	86.9
Environmental Stewardship				Compiled		REV 0, 12-Jan-23

Table 1. Results of PFAS sampling in the Colorado River and tributaries in Bastrop County, TX. (See also Appendix)

The highlighted yellow portions indicate detected levels of PFAS that were of concern by Cyclopure. Highlighted values do not necessarily indicate these locations exceeded advisory levels as outlined by the EPA, rather the chemical was detected by Cyclopure's lab. However, based upon these results many test sites are contaminated beyond the advisory levels published by EPA.

Results of the study are recorded in Table 1. The sampling locations, relative levels of contamination, and locations of wastewater treatment plants discharging into the Colorado River basin⁵ are depicted in Figure 1. Cedar Creek (ES-6) and Piney Creek (ES-7) were the only tributaries tested that contained levels of PFOA, PFOS, and PFBS that are below the EPA's Health

⁵ The Colorado River Basin covers 40,000 square miles from eastern New Mexico to the Gulf of Mexico. Onion Creek (ES-1) is an important tributary to the Colorado River Basin.

Advisory Standards. Big Sandy Creek (ES-9), Alum Creek (ES-5), and Wilbarger Creek (ES-8) contained low levels of PFOS and PFBS but not of PFOA, which was above the Health Advisory levels. All other samples, Onion Creek (ES-1), Gilliland Creek (ES-2), Decker Creek (ES-3), Colorado River at Smithville (ES-4), Colorado River at Webberville Upstream (U), and Colorado River at Bastrop Downstream (D), indicated levels of contamination of PFOA and PFOS above the levels defined by the EPA per the 2022 update to the health advisory. No test sites exceeded the recommended levels of PFBS.

Other PFAS compounds that do not currently have drinking water Health Advisory levels were detected at all sites.

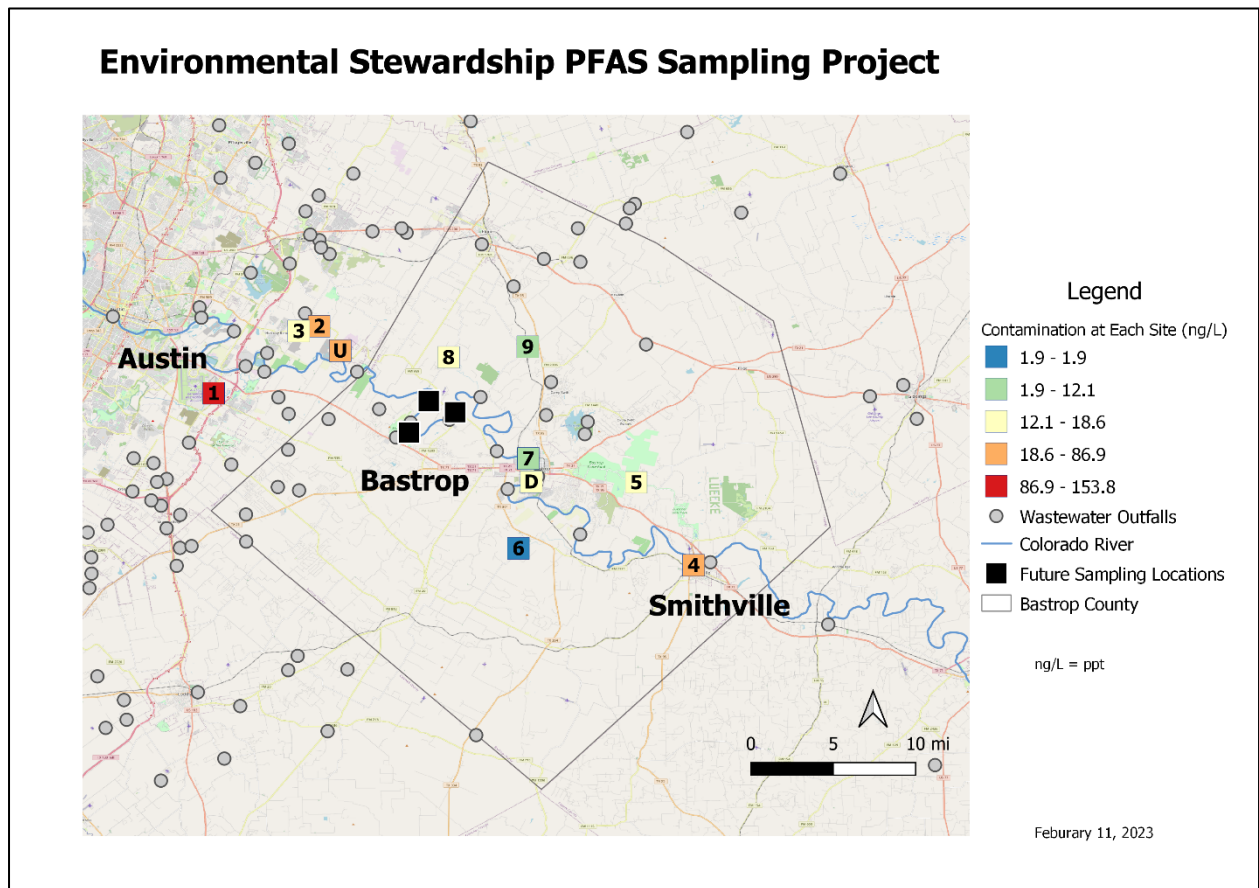


Figure 1: Map showing the location of samples taken, the relative level of contamination present, and the location of wastewater treatment plants discharging into the river basin in the region.

Discussion

The study conducted is preliminary and not designed to comment on the impact of this contamination on potential adverse effects on citizens in this area, fish and wildlife, or consumption of fish and wildlife containing PFAS compounds. The impacts of PFAS on human health and wildlife require further study.

The result of widespread contamination of PFAS in the surface water was the expected outcome due to the prolific and widespread use of PFAS chemicals for industrial purposes. This study does not provide a comprehensive view of PFAS contamination in Bastrop County, and further field research must be conducted to grasp the entirety of the current outlook on PFAS contamination. Furthermore, the testing methods employed in this study do not meet the federal and state standards for toxicity testing. ES does not claim these results should become the basis for legislation, rather inform policy and decision-makers of the existence of contamination and draw attention to the need for further in-depth research in this area. As a preliminary study, we have identified contamination in most testing sites and must further research the extent of PFAS in the ecosystem.

Conclusion

Upon the discovery of widespread contamination of surface water in the Bastrop/Austin area, it is imperative to conduct a study of groundwater used for drinking. ES will embark on another round of testing in the alluvial aquifers in the Willcox group. The alluvial aquifer exchanges water with the Colorado River, and it is likely that PFAS contamination may also be found in the other aquifers based upon the results of this study.

References

Domingo, José L., and Martí Nadal. "Human exposure to per-and polyfluoroalkyl substances (PFAS) through drinking water: A review of the recent scientific literature." *Environmental research* 177 (2019): 108648.

EPA Notice of PFAS Health Advisory, Federal Register Vol. 87 Number 118, June 21, 2022, page 36848. <https://www.govinfo.gov/content/pkg/FR-2022-06-21/pdf/2022-13158.pdf>

Fenton, Suzanne E., et al. "Per-and polyfluoroalkyl substance toxicity and human health review: Current state of knowledge and strategies for informing future research." *Environmental toxicology and chemistry* 40.3 (2021): 606-630.

Health Advisories Explained: <https://www.epa.gov/sdwa/drinking-water-health-advisories-has>

APPENDIX

Environmental Stewardship, TX PFAS Testing Dec 2022

Detects Highlighted in Yellow by Cyclopure

Format part per trillion (ng/L); LOQ 1.0 ppt all PFAS, except GenX 2.0 ppt

ES Name	Colorado River, Webberville Upstream (U)	Big Sandy Creek ES-9	Piney Creek ES-7	Cedar Creek ES-6	Wilbarger Creek ES-8	Texas PFAS Regulations.
ES Kit Number	Colorado River, Boat Ramp @ Webberville, TX	Bastrop, TX 78602 ES-9; BSC	Bastrop, TX 78602 ES-7; PNC	Bastrop, TX 78602 ES-6; CEDC	Elgin, TX 78621 ES-8; WLC	EPA has set Health Advisory Levels for PFOA (0.004 ppt); PFOS (0.02); GenX (10 ppt) and PFBS (2,000 ppt). Texas Commission on Environmental Quality has not established PFAS drinking limits at this time. Per Cyclopure
Sampling Location	Unfiltered	Unfiltered	Unfiltered	Unfiltered	Unfiltered	
Filtered/Unfiltered						
Sampling Date	9/16/22	12/17/22	12/17/22	12/17/22	12/17/22	
Order ID	wtk-22-00126	P-140680472	P-140680472	P-140680472	P-140680472	
PFBA	2.3	1.6	1.6	1.9	2.2	
PFPeA	3.9	4.4	< 1 ng/L	< 1 ng/L	8.4	
PFHxA	3.8	2.9	< 1 ng/L	< 1 ng/L	2.8	
PFHpA	1.9	< 1 ng/L	< 1 ng/L	< 1 ng/L	< 1 ng/L	
PFOA	2.7	2.1	< 1 ng/L	< 1 ng/L	1.8	
PFNA		< 1 ng/L	< 1 ng/L	< 1 ng/L	< 1 ng/L	
PFDA		< 1 ng/L	< 1 ng/L	< 1 ng/L	< 1 ng/L	
HFPO-DA (GenX)		< 2 ng/L	< 2 ng/L	< 2 ng/L	< 2 ng/L	
PFBS	1.9	1.1	1.2	< 1 ng/L	3.4	
PFHxS	5.1	< 1 ng/L	1.8	< 1 ng/L	< 1 ng/L	
PFOS	4.2	< 1 ng/L	< 1 ng/L	< 1 ng/L	< 1 ng/L	
Total PFAS (11 Compounds)		12.1	4.6	1.9	18.6	
Additional PFAS						
6:2 FTS		< 1 ng/L	< 1 ng/L	< 1 ng/L	< 1 ng/L	
FBSA		< 1 ng/L	< 1 ng/L	< 1 ng/L	< 1 ng/L	
PFHpS		< 1 ng/L	< 1 ng/L	< 1 ng/L	< 1 ng/L	
PFPeS		< 1 ng/L	< 1 ng/L	< 1 ng/L	< 1 ng/L	
Total PFAS (All Detected)	25.8	12.1	4.6	1.9	18.6	
ES Name	Colorado River, Bastrop Downstream (D)	Alum Creek ES-5	Gilliland Creek ES-2	Onion Creek ES-1	Decker Creek ES-3	Colorado River, Smithville ES-4 (54)
ES Kit Number	Colorado River downstream of HWY 71 Bridge, Bastrop, TX	Smithville, TX 78957 ES-5; ALC	Manor, TX 78653 ES-2; GILC	Austin, TX 78617 ES-1; ONC	Austin, TX 78725 ES-3; DEC	Smithville, TX 78957 ES-54; CRS
Sampling Location	Unfiltered	Unfiltered	Unfiltered	Unfiltered	Unfiltered	Unfiltered
Filtered/Unfiltered						
Sampling Date	9/16/22	12/17/22	12/16/22	12/16/22	12/16/22	12/17/22
Order ID	wtk-22-00126	P-140680472	P-140680472	P-140680472	P-140680472	P-140680472
PFBA	1.9	2.1	2.4	4.8	3	7.8
PFPeA	2.8	2.6	10.3	12.4	3	12
PFHxA	3.1	3.5	6	13.9	2.1	12.7
PFHpA	1.5	1.1	1.7	8	1.2	5.1
PFOA	1.7	1.4	4.7	7.9	2	6.7
PFNA		< 1 ng/L	1.2	1.1	< 1 ng/L	1.6
PFDA		< 1 ng/L	< 1 ng/L	< 1 ng/L	< 1 ng/L	< 1 ng/L
HFPO-DA (GenX)		< 2 ng/L	< 2 ng/L	< 2 ng/L	< 2 ng/L	< 2 ng/L
PFBS	1.3	4.3	6.7	7.1	1.9	7.4
PFHxS	2.1	< 1 ng/L	2.1	37.5	1.4	16.2
PFOS	3	< 1 ng/L	2.2	53.4	1.9	12.2
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PFHpS		< 1 ng/L	< 1 ng/L	3.2	< 1 ng/L	< 1 ng/L
PFPeS		< 1 ng/L	< 1 ng/L	3.2	< 1 ng/L	< 1 ng/L
Total PFAS (All Detected)	17.4	15	37.3	153.8	16.5	86.9
Environmental Stewardship					Complied	REV 0, 12-Jan-23