




MEMORANDUM

TO: Mayor and Council

FROM: Christopher Herrington, P.E., Environmental Officer 
Watershed Protection Department

DATE: August 28, 2019

SUBJECT: **Response to Council Resolution 20190619-183 regarding Kinder Morgan Pipeline**

The purpose of this memo is to provide a summary of potential water quality impacts that the proposed Kinder Morgan Permian Highway Pipeline may have on the Trinity and Edwards aquifers in response to Council Resolution [20190619-183](#). Attached please find a staff report for your consideration.

If you have any questions about environmental concerns regarding the proposed pipeline, please contact me at 512-974-2840 or chris.herrington@austintexas.gov.

cc: Spencer Cronk, City Manager
Rey Arellano, Assistant City Manager
Jose M. Guerrero, P.E., Interim Director, Watershed Protection Department

Attachment



Potential Water Quality Impacts of the Proposed Kinder Morgan Permian Highway Pipeline

SR-19-10; August 2019

City of Austin Watershed Protection Department
505 Barton Springs Road, 11th floor
Austin, Texas 78704

Introduction

At the June 19, 2019 meeting, the Austin City Council adopted Resolution [20190619-183](#) which directed the City Manager to “study the potential water quality impacts a pipeline transporting hydrocarbons would have on the Trinity and Edwards aquifers.” The focus of the Resolution is the proposed Permian Highway Pipeline. This report focuses on the potential water quality impacts of the proposed PHP. This analysis is limited due to the fact there is little publicly-available information about the PHP.

Pipeline Overview

Kinder Morgan Texas Pipeline (KMTP) and EagleClaw Midstream Ventures propose constructing a 42-inch, 430-mile long steel natural gas pipeline, through the Central Texas Hill Country. The pipeline is proposed to travel through Gillespie, Blanco, and Hays counties, where it will cross through the Edwards Aquifer Recharge and Contributing Zones (Figure 1). The exact alignment of the pipeline is not publicly known and may ultimately be dependent on right-of-way acquisitions. The proposed PHP will carry approximately 2.1 billion cubic feet per day of natural gas from the Permian Basin in West Texas to existing pipelines northeast of Houston for transport to export facilities on the Texas coast. KMTP has stated that nearly all of the natural gas will be for export and not for domestic use.

KMTP is currently in the process of acquiring right-of-way through eminent domain and condemnation. KMTP has stated its intent to acquire a 125-foot wide temporary construction easement and a 50-foot wide permanent easement for the pipeline. Pipeline construction is currently proposed to start in Fall 2019. Pipe is currently being stockpiled along the route. KMTP has stated they intend to have the pipeline operational in late 2020.

KMTP has publicly stated that it has done an alternative route analysis and has conducted analyses of environmental risks and impacts. However, they have not shared this information with the public.

There is a significant lack of pipeline capacity to transport gas from the Permian Basin in west Texas to export facilities on the Gulf Coast. As a result, a large amount of natural gas, a byproduct of crude production, is being flared off contributing substantial amounts of greenhouse gas to the atmosphere. Limits on flaring of gas by the Texas Railroad Commission (TRRC) is limiting the expansion of oil production in the Permian Basin. This is driving the need for more gas pipeline capacity. It is anticipated that additional pipelines may be proposed in the near future. The proposed PHP route across the Edwards Aquifer is the shortest straight line distance from the Permian Basin to the Houston area. Successful completion of the PHP may attract other pipelines to this area.

Existing Pipelines in Austin

There are four active natural gas and hazardous liquid transmission pipelines located over the Barton Springs Segment of the Edwards Aquifer. These existing pipelines are all substantially smaller in diameter than the proposed 42-inch PHP. There have not been any new hazardous liquid or natural gas pipelines built over the Barton Springs Segment of the Edwards Aquifer in many decades. Although the All-American Pipeline was proposed, it was not built due to environmental concerns. The most recent significant project was the Longhorn Pipeline conversion from crude oil to refined projects in the early 2000s. For the Longhorn Pipeline, following a lawsuit, the federal government required major changes to the existing pipeline to mitigate environmental risks in order to approve the conversion. Longhorn Pipeline has since been reconverted to crude oil transport; however, the mitigation requirements remain in place. Kinder Morgan to date has not publicly committed to the same type of mitigation measures in use for the Longhorn Pipeline.

Regulatory Status

The PHP is classified as an intrastate pipeline. Thus, the PHP is not subject to federal siting regulations. Intrastate pipelines in Texas are regulated by the Texas Railroad Commission (TRRC), which does not provide opportunities for public review and input from the public. There is minimal regulatory oversight for siting new pipelines in Texas.

The PHP is subject to some environmental regulation through the TRRC, although not through the Texas Commission on Environmental Quality. Pipelines are specifically exempted from having to comply with the Texas Edwards Aquifer protection rules. As such, KMTP will not have to provide void mitigation during construction or other protections for the aquifer.

Potential Environmental Impacts

This report focuses primarily on impacts to environmental resources and species of concern in the vicinity of Austin. These resources and species include the contributing and recharge zones of the Barton Springs Segment of the Edwards Aquifer (the “Barton Springs Zone”), the Trinity Aquifer, area creeks, area springs, the Barton Springs salamander (*Eurycea sosorum*), the Austin Blind salamander (*Eurycea waterlooensis*), and the Golden-cheeked warbler (*Setophaga chrysoparia*).

Risks to Environmental Resources

Natural gas is a gas at ambient temperature and pressure and is lighter than air. These characteristics reduce the potential impacts of a pipeline gas release to groundwater and surface water. Natural gas is primarily methane, which is one of the most potent greenhouse gases. The PHP will capture gas currently being released to the atmosphere in west Texas. A gas release from the PHP would contribute to local air pollution.

The proposed route for the PHP is along the Edwards Aquifer groundwater divide between Barton Springs and the San Marcos springs. Depending on groundwater conditions, groundwater flow can vary between these two locations and so the operation of the pipeline presents a potential risk to both of these significant, highly sensitive environmental resources.

Potential Risks during Construction

Environmental risks of the PHP vary by project phase. Construction phase risks are primarily from sediment discharge from disturbed soils, spills of fuel and lubricant from construction equipment, and direct impacts to karst features (e.g., voids) encountered during trench excavation (Figure 2). Inadequate erosion and sedimentation controls and poor revegetation practices could occur. Inadequate revegetation of the pipeline right-of-way can create longer term water quality impacts from erosion of soil, decreased infiltration of rainfall, and decreased filtration of stormwater runoff, in addition to habitat degradation.

Construction of pipelines in karst terrain is known to be challenging. The Mariner East pipeline in Pennsylvania was recently shut down by regulators due to multiple sinkholes occurring along the right-of-way after construction which generated concerns about structural stability of the pipeline. Given the proposed location of the PHP, it is highly likely the trench will intersect fissures and voids, potentially altering flow pathways within the aquifers and creating pathways for contaminants to spread along underground conduits. The Barton Springs Edwards Aquifer Conservation District (BSEACD) has identified several known and suspected karst features over the Edwards Aquifer along the proposed pipeline route.

The PHP is exempt from the Texas Commission on Environmental Quality’s Edwards Aquifer protection rules, which are intended to minimize impacts of subsurface utilities. For example, TCEQ has void mitigation requirements to address karst features found during trenching for utilities. Although KMTP states that they are aware of issues related to karst geology, it is unknown what measures KMTP will take to address the unique challenges of construction in a karst terrain.

There are multiple protected species that could be impacted by pipeline construction. The golden-cheeked warbler, which is a protected songbird, has significant habitat along and in the vicinity of the proposed PHP pathway. Golden-cheeked warbler habitat is characterized by contiguous areas of mature oak-juniper woodlands. The proposed 125-foot wide construction easement is likely to be completely clear cut of these woodlands for construction of the pipeline. While much of this temporary easement would be allowed to revegetate, it will likely be decades before impacted areas would be restored to potential golden-cheeked warbler habitat. Furthermore, it is a common practice for pipeline owners to keep a 50-foot permanent easement clear of all trees making potential habitat fragmentation permanent in some areas.

Potential Risks during Operation

During operation of the PHP, the most significant threat to groundwater and surface water is from a release of liquids from the pipeline, which would contribute to degradation of water quality and negatively impact aquatic habitat. Additionally, if the PHP right-of-way is inadequately revegetated, the construction will likely create longer term water quality impacts from erosion of soil, decreased infiltration of rainfall, and decreased filtration of stormwater runoff.

Natural gas is typically dehydrated prior to entering a transmission pipeline. However, liquid may be still present in a gas pipeline and may accumulate in the pipeline from a variety of sources, including condensation. Federal regulations (though not applicable to the PHP) require natural gas transmission pipelines to provide facilities for draining accumulated liquids (49 CFR 192.476), further demonstrating the probable presence of these liquids in the PHP. While KMTP disputes that liquid of any quantity will occur in the pipeline, pipeline engineers contacted by staff confirmed that liquid does occur in gas transmission pipelines, and could occur in the thousands of gallons where there are long segments between valves and/or drains.

These accumulated liquids are likely to contain hydrocarbons in high concentrations. Concentrations of hydrocarbon liquids in condensate may be high as there would be minimal dilution, although the accumulated volume of those liquids is unknown. A pipeline break or faulty operation could release these liquid hydrocarbons, presenting a risk to nearby groundwater, springs, and surface water. Tanks that store these liquids could also present a potential source of hydrocarbon release to groundwater and surface water.

Populations of the federally protected Barton Springs salamander and Austin blind salamander occur in the Barton Springs Complex within Zilker Park. Recent studies have identified populations of Barton Springs salamanders at other spring locations outside of Austin and down gradient of the proposed PHP. The fully aquatic salamanders are highly sensitive to contaminants in water, including hydrocarbons.

Although the exact flow pathways are not definitively known, dye tracing completed by the City of Austin and regional partners has demonstrated that water in the Blanco River Basin and in the vicinity of the proposed PHP pathway could migrate to Barton Springs under low groundwater flow conditions which occur approximately 20% of the time with a travel time of several months. Thus, a release of liquid hydrocarbons from the PHP could adversely impact the Barton Springs

Complex and habitat for federally protected salamanders in Zilker Park, and these impacts could occur at a time when habitat conditions are sub-optimal due to reduced spring flows and salamanders are already under stress. The potential impacts to salamanders in San Marcos Springs would likely be similar to those in Barton Springs. Other known Barton Springs salamander populations outside of Zilker Park are most likely outside of potential groundwater flow paths within the aquifer.

Staff have been unable to obtain data on the possible volume of liquid or chemical composition of liquid contaminants that may be present in the PHP. Although a groundwater connection between the proposed PHP route and the Barton Springs Complex exists, and salamanders would be sensitive to hydrocarbon contaminants in groundwater, staff are unable to quantify the risks to Barton Springs because insufficient information exists about the volume of hydrocarbon condensate in the pipeline, the chemical constituents, and their concentrations, to enable a quantitative fate analysis.

Impacts to Water Quality Protection Lands

The proposed PHP route is near City of Austin Water Quality Protection Lands. Several water wells are on Water Quality Protection Lands between FM 150 and FM 967 that could be impacted if contaminants enter the aquifer and migrate northward. The City of Austin may have very limited options to prevent pipelines from being routed through these sensitive properties.

Future Change in Pipeline Contents

Transmission pipelines can be converted to carry different products as market conditions change. A local example of this is Longhorn Pipeline which was converted from crude oil service to refined products in the early 2000s, and converted back to crude oil service roughly 10 years later. Although hazardous liquids pipelines the size of the proposed PHP are rare, it is possible that the PHP could be converted to hazardous liquids service in the future. Kinder Morgan has stated publicly they intend to limit the easements they are acquiring to natural gas pipelines. New or modified easements may be necessary to convert the PHP to hazardous liquids in the future. Hazardous liquids, such as crude oil, would present a substantially greater threat to groundwater and surface water.

Conclusions

After reviewing the limited available information about the pipeline project, staff concludes that:

- The proposed PHP route occurs in an area that contributes flow to Barton Springs under low flow conditions that occur approximately 20% of the time.
- Applicable regulations are not sufficient to ensure that no adverse environmental consequences will occur as a result of the construction and operation of the PHP.
- Surface water and groundwater quality may be adversely impacted by sediment and contaminant discharge during construction.

- Recharge patterns and flow pathways within the aquifer may be impacted if voids are intercepted during construction and not properly mitigated.
- Gas transmission pipelines can contain liquid contaminants. Accidental release of the hydrocarbon liquids to surface water or groundwater could occur. The chemical constituents, concentrations, and volumes of potential liquids within the PHP are not known. Thus, a quantitative analysis of the risk of hydrocarbon contamination of the Edwards Aquifer cannot be completed at this time.
- If contaminants from a pipeline release were to reach the Barton Springs Complex at a sufficient concentration, it is possible that it would negatively impact federally protected species. The extent of that impact cannot be predicted given the lack of information on volume and characteristics of a release from the pipeline.

Potential Actions by the City

Based on these conclusions in combination with the lack of information about alternative routes and impacts to sensitive environmental resources, staff suggest the following possible actions for consideration:

1. Sharing these concerns with the Texas Railroad Commission, Texas Commission on Environmental Quality, U.S. Fish and Wildlife Service, and the U.S. Corps of Engineers, seeking additional information and asking that they seek the additional information from Kinder Morgan necessary to facilitate a more comprehensive analysis.
2. Coordinating technical information sharing and collaborating with other potentially concerned entities, including the Barton Springs/Edwards Aquifer District, Hays Trinity Groundwater Conservation District, Edwards Aquifer Authority, City of San Marcos, City of Kyle, the Wimberley Valley Watershed Association, other groundwater conservation districts, and potentially impacted property owners.
3. Supporting state legislative initiatives to provide greater protection for owners of conservation lands or easements.
4. Supporting state legislative initiatives to require pipeline projects to undergo a public review and comment process that includes environmental impact and route alternatives analyses.

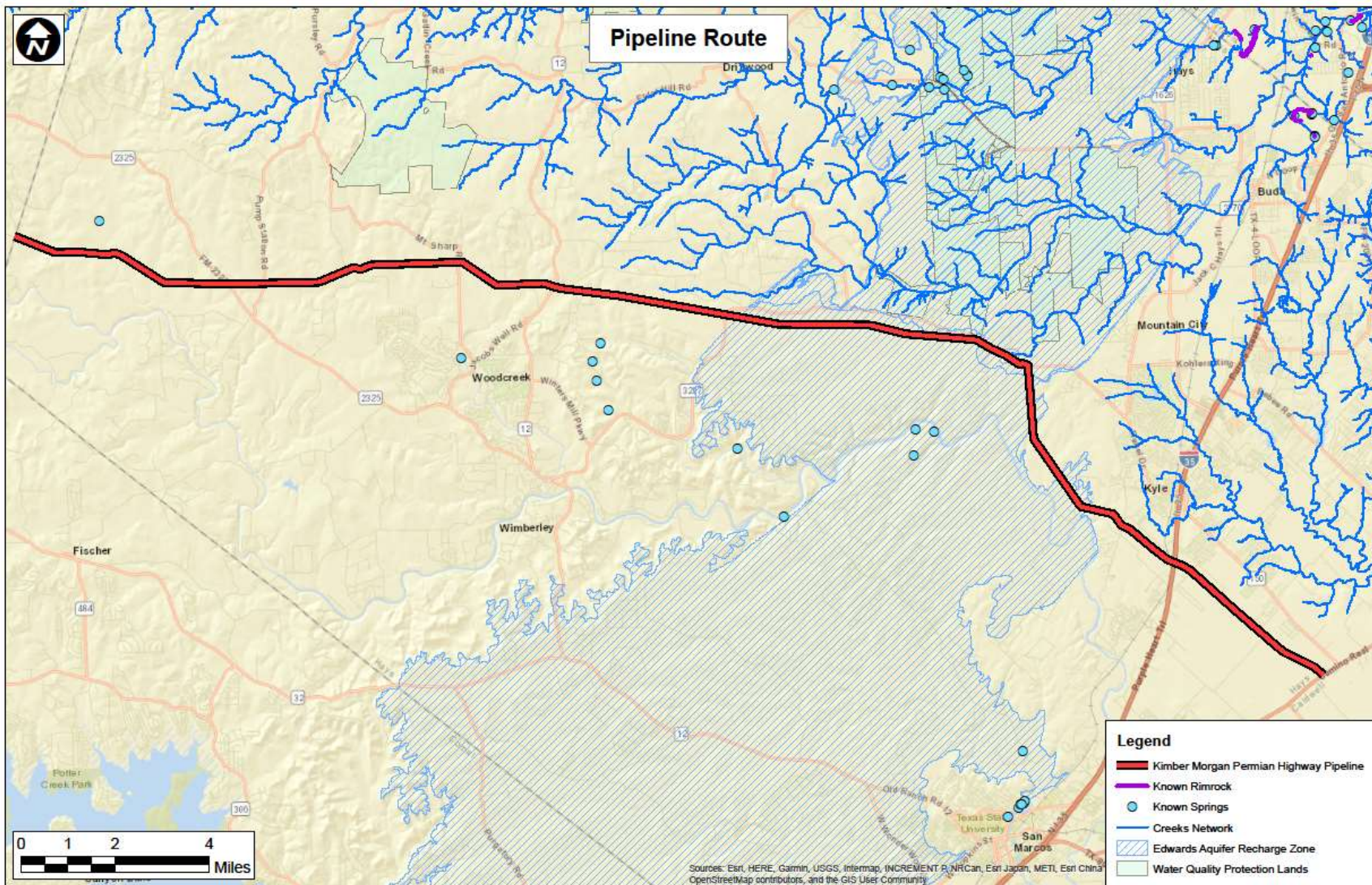


Figure 1. Potential pathway of the proposed Permian Highway Pipeline across the Edwards Aquifer in Hays County.



Figure 2: Photo of construction of a representative 42-inch pipeline in a 125-foot wide easement.