Byhalia Connection Pipeline: Environmental, Financial, and Community Risks

--- **Memphis Community Against the Pipeline** and **Protect Our Aquifer** ---

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Introduction

This document highlights some serious concerns surrounding the proposed Byhalia Connection pipeline. In addition to **(1) inadequate safeguards from the permitting process**, there are several other threats to the community and the environment that this project poses. Some of the risks described in this document result from Plains All American Pipeline's **(2) (Plain's) abysmal safety record**, the **(3) unique geology of the Memphis area**, and the **(4) likely insolvency of the corporate entities** behind the pipeline. The discussion in this document is limited to the threats posed by the convergence of multiple risk-factors associated with the proposed pipeline, and does not include grave community concerns around **(5) environmental injustice** and **(6) property rights and abuse of eminent domain**, which in and of themselves are powerful arguments against this project, have sparked public outrage, and have been covered extensively by activists and journalists [1][2][3][4][5][6][7].

These are just six of many reasons why the communities in Memphis and Shelby (TN) and DeSoto (MS) counties, the relevant regulatory agencies and boards, and the lawmakers representing these communities at the local, state, and national levels should not be assuaged by the reassurances from Valero and Plains on the safety, appropriateness, and necessity of the Byhalia Connection Pipeline. It would be prudent for all community stakeholders to reject this project and do everything in their power to stop it.

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Permit limitations

The proposed Byhalia Connection pipeline was recently granted Tennessee Department of Environment and Conservation's (TDEC's) Aquatic Resource and Alteration Permit and the US Army Corps of Engineers (USACE) Nationwide Permit 12 (NWP 12), which authorizes pipeline and utility line installations in waters of the United States with little or no delay where there are minimal impacts.

Both these permits have serious limitations. Despite similar permits, which experience has shown to be alarmingly lax, between 2010 and 2018, oil and gas pipelines encountered more than 5500 accidents resulting in 596 injuries, 126 deaths, 808 fires, 129 explosions, and more than 4 billion dollars in damages [1]. Oil pipelines were responsible for roughly two thirds of the incidents and damages. According to the Pipeline and Hazardous Materials Safety Administration (PHMSA), 99.999% of crude oil transported via a pipeline successfully reaches its destination; of the 0.001% lost, about two-thirds is unintentional (i.e., leaks or spills) [1]. If the Byhalia Connection pipeline follows the national average, then at the rate of 300,000 barrels (12.6 million gallons) a day, it will leak about 300,000 gallons of oil in ten years with almost near certainty. Can we afford 300,000 gallons of oil in the vicinity of the Memphis Sand Aquifer?

Despite sensing, alerting, and other mitigation technologies, leaks can go unnoticed for days or weeks [2]. A study [3] commissioned by PHMSA found that automated leak detection systems had a woeful 15% effectiveness rate in oil pipelines, and among the 85% leaks detected by humans, emergency responders or members of the public were more likely to detect hazardous liquid pipeline spills than pipeline companies themselves! In other words, despite operators' safety claims based on the permitting process and safety equipment, oil pipelines are inherently unsafe and given enough time, are almost guaranteed to leak.

TDEC admits that its permit has shortfalls and there are things that it does not consider [4]. Additionally, some of TDEC's determinations are based on the assumption of a protective impact of a confining clay layer over the Memphis Sand Aquifer. A recent rigorous hydrogeologic study [5] found these assumptions to be invalid and the risk to the aquifer to be considerable due to the vulnerability of MLGW's Davis well field that the pipeline route crosses, violating its Wellhead Protection Zone.

The USACE NWP 12 too considers a very narrow range of risks and is essentially a loophole that oil and gas companies exploit in order to avoid a thorough environmental impact study and community input. In particular, per USACE interpretation, application, and past practice, “public water supply intake” refers to surface water intakes [6]. This goes to show how meaningless these permits with gaping regulatory holes are, given that Memphis is 100% dependent on groundwater!

While disregarding groundwater contamination is a glaring shortcoming of NWP 12, USACE is required to consider the risks of oil spills from pipeline operation in general [6]. As discussed in detail in the Earthquake Risk section of this document, it is clear that USACE did not adequately consider these before issuing an NWP 12 permit for the Byhalia Connection pipeline, and this permit must be challenged.

Due to its limitations and lack of rigor, USACE NWP 12 has been routinely challenged in courts. A noteworthy challenge was in the context of the now defunct Keystone XL (KXL) pipeline in which not only did a Montana court cancel KXL’s permit [7], but also froze the issuance of this permit [8]. Although a subsequent ruling from the US Supreme Court reinstated the issuance of the permit, in anticipation of similar challenges in the future, USACE recently revised and split NWP 12 [9] so that electricity, telecom, water and other lines unrelated to oil and gas are not affected by litigation challenging NWP 12 for oil and gas pipelines that USACE fully expects to encounter.

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Safety record of Byhalia Pipeline partners

As bad as pipeline safety is, Plains' well-documented [1][2] poor safety record makes the Byhalia Pipeline situation even worse.

Following a leak from a Plains pipeline in Santa Barbara in 2015 [Fig. 1] that released 143,000 gallons of crude oil, research [1] by The Los Angeles Times using a database maintained by the PHMSA [3] found that Plains' rate of incidents per mile of pipe is more than three times the national average. Among more than 1,700 pipeline operators listed in the database maintained by the federal agency, only four companies reported more infractions than Plains Pipeline. It is noteworthy that, just like in the case of the Byhalia Connection pipeline, Plains reassured the California government that a break in the line was "extremely unlikely" and state-of-the-art monitoring could quickly detect possible leaks and alert operators [4]. These reassurances proved false, and similar reassurances in the context of the Byhalia pipeline are meaningless.

For the Santa Barbara leak due to corrosion, which occurred just a year after a leak in Los Angeles [Fig. 2] due to a faulty valve [5] in another Plains pipeline, a jury found Plains guilty of the felony count of knowingly discharging oil into the waters of California. Plains was also found guilty of knowingly making a false or misleading oil spill report to the California Office of Emergency Services and failing to immediately report any release or threatened release of a hazardous material to emergency agencies upon discovery, both misdemeanor charges. Plains was found guilty of six additional misdemeanor charges [6]. A summary of Plain's violations and fines (excluding the $60 million settlement for the Santa Barbara leak) can be found here: [7].

The Mayflower, AR spill [Fig. 3] from ExxonMobil's Pegasus pipeline [8] not only provides a glimpse of what Memphis could face [9] in the event of a leak, but also shows that even industry-leading international oil companies are not immune from pipeline accidents in residential areas.

The problems of leaks, lack of transparency, and bad faith actions are not limited to pipeline operators only. An investigative journalist recently discovered [10], by poring over PHMSA records, that Valero had a previously undisclosed spill of 800 gallons of crude in 2020 at its facility near the Byhalia pipeline's planned connection point, in the unprotected recharge zone of the Memphis Sand Aquifer, for which it spent almost $1 million in repairs and remediation.

While Byhalia Pipeline LLC has been making claims of safety in their advertising and through other public relations channels, their joint owners' own annual reports and SEC filings [11][12]

contradict these claims [Fig. 5]. In fact, Plains All American Pipeline admits that the risk of leaks increases with every increase in the mileage of pipelines that they operate [11]; i.e., every new project like the Byhalia Connection pipeline comes with an explicit risk of leakage.

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Earthquake risk

None of the permits obtained by Byhalia Pipeline LLC considered earthquake risk. This is one example of the lax nature of the USACE NWP 12. While groundwater is not within the scope of the NWP 12 review, an oil pipeline in an earthquake-prone region is a threat to both ground and surface water. This is grounds for questioning the legitimacy of Byhalia pipeline's NWP 12.

Memphis lies within the New Madrid Seismic Zone (NMSZ), which is the most active seismic area [Fig. 6] in the central and eastern United States [1][2][5]. The probability of a magnitude 6.0 or higher earthquake within 50 years is 24-40%; the probability of a major earthquake of magnitude 7.0 or higher during the same time is about 10% [2][3][4].

These data point to a moderate risk of an earthquake occurrence; however, the potential for damage is extremely high due to the fact that the Memphis region is situated on top of layers of sediment [4][6]. An earthquake is likely to last longer with longer vibration periods [4][6] than a similar earthquake on the west coast. The zone of damage from an earthquake in this region is also likely to spread farther from the epicenter. Additionally, this region faces unique risks, such as an extreme degree of soil liquefaction [2][4][6] with a low triggering threshold in the event of an earthquake. Furthermore, earthquakes can and do breach an aquifer's confining layers [7], thereby releasing previously confined contaminants into the aquifer.

It goes without saying that natural events, such as earthquakes and floods, can result in accidents in oil and gas pipelines with potentially severe consequences to the population and to the environment [8]. And indeed, this has happened! For instance, the 1994 Northridge earthquake in California had a magnitude of only 6.7, but caused eight ruptures along 35 miles of an oil pipeline, releasing about 200,000 gallons of oil [9][10]. The biggest hazard to underground pipelines is soil liquefaction [11], which the Memphis area is particularly susceptible to [2][4][6] in the event of even a moderate earthquake. A recent study [12] concludes that underground oil and gas pipelines are even more susceptible to earthquakes than previously believed.

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Risks from imminent energy transition

The Byhalia Connection pipeline is contrary to the reduced-carbon future based on environmental justice that we as a community, nation, and the world are heading towards. The politicization of the science and facts surrounding climate change and renewable energy technologies in the United States is unfortunate, and it costs everyone along the entire political spectrum in terms of economics and health [1], the latter due to deadly emissions from tailpipes, refineries, and power plants.

Politics notwithstanding, there is no denying the fact that the world is at the cusp of an energy transition [2][3]. New energy leaders are emerging in both the electricity [4] and transportation [5] sectors and are displacing the old ones that are slow to adapt. All auto manufacturers [6][7][8][9], responsible governments [10][11][12], and pragmatic oil industry leaders [13][14][15] are actively preparing for and participating in the transition. Even oil industry analysts are predicting that Lithium, used in electric vehicle (EV) batteries, is the commodity of the future [16] (and, ironically, water [17] that this pipeline threatens).

The energy transition and accelerating electrification of transportation are not media confabulations as some fossil fuel interests allege, but are palpable all around us. In 2020, sales of plug-in vehicles experienced an year over year increase of 43% worldwide, 137% percent in Europe, 4% in the US, and 12% in China. All this, when the total global, European, US, and Chinese auto sales were down (due to the pandemic) 14%, 20%, 15%, and 4% respectively [18]. Signs of the transition, and its positive economic impact, are visible right here in Tennessee [19][20][21].

These developments have very serious implications for Valero, Plains, and Byhalia pipeline; i.e., gasoline has a bleak future, as stated bluntly in an oil industry trade publication [22] based on research by Morgan Stanley. These companies are almost certain to experience extreme financial stress in the coming years, severely hampering their ability to maintain their sprawling infrastructure as well as their financial commitments. Even without the impending permanent downturn in the oil industry, the economic benefits touted by Byhalia Pipeline [23] in the form of local jobs and tax revenues are gross exaggerations [24] (everyone knows that pipeline jobs are nonlocal and temporary). However, even the fraction of the claimed economic benefits that do materialize will be short-lived.

Not only are the economic benefits unlikely to materialize beyond a relatively short period, eventually the pipeline is likely to become a liability for Memphis, Shelby and DeSoto counties, and Tennessee. It just took a little over a decade for the US coal industry to collapse [25] and in the wake of its collapse, it is leaving taxpayers with massive cleanup liabilities [26] because the safeguards that were supposed to ensure orderly decommissioning proved to be woefully inadequate [27]. It is just a matter of time before state and local governments friendly to oil interests face a similar reckoning. As a matter of fact, some already are [28]. While the rout is currently limited to small- and medium-sized companies, the contagion will eventually spread to larger players such as Plains and Valero. We know this from the recent history of coal [29].

Unsurprisingly, the fiscal health of both Valero and Plains has been deteriorating lately. Valero has dramatically underperformed the S&P 500 benchmark during the last three years [Fig. 6]. Plains, in particular, is in an alarming downward spiral. Having lost roughly 85% of its market value from its peak in 2014, its current market capitalization is below the level when it began trading in 1998 [Fig. 7].

Decommissioned oil pipelines retain hazardous chemicals forever and require permanent monitoring [30]. A recent report [31] details the myriad problems that abandoned pipelines are already causing property owners. Once the oil stops flowing through the Byhalia pipeline due to evaporating demand and Plains is financially insolvent, who will watch the pipeline for eternity? We already know the answer from the coal industry [26][27] and the Texas oil industry [28] experiences.

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Concluding remarks

While evaluating the appropriateness of the Byhalia Connection Pipeline in the context of the multiple risks enumerated in this report, it is not sufficient to analyze each risk factor in isolation. This is a situation with interconnected, compound, interacting, and cascading risks [1]. For example, the financial health of the companies, their poor and below average safety record, and the generally bleak pipeline leak statistics are all risk factors in themselves. However, financial stress can induce these companies already known for lax safety to implement cost-cutting in staffing and equipment necessary for safe operations, thereby compounding the risk of a leak. Similarly, a seismic event can not only cause a pipeline rupture, but can also increase the permeability of the Upper Claiborne Confining Unit and contaminate the aquifer with not only the oil discharged from the earthquake-induced leak, but also from all previous leaks; this is an example of interacting as well as cascading risks. The interconnected, compound, interacting, and cascading risks must be considered holistically [1] and balanced against the long-term benefits of the project, if any.

We are at a juncture where we have clear choices. Are we going to be on the right side of history and embrace a future with justice, health, and prosperity that we are getting a glimpse of from the nascent EV industry sprouting in Tennessee, or are we going to choose redlining, bullying, environmental racism, corporate greed, fossil-fuel grime, a contaminated aquifer, and eventually miles of decaying pipeline filled with toxic residue threatening to poison Memphis' people above and its water below? It's a choice that everyone in a decision making or law making position should weigh conscientiously in the coming weeks and months, with reason, compassion, integrity, fairness, and foresight.

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Figures

Figure 1: The Refugio oil spill on May 19, 2015, deposited 142,800 gallons of crude oil onto one of the most biologically diverse coastlines of the West Coast of the United States, resulting in financial impacts to the county estimated at up to $74 million. The oil pipeline operator, Plains All American Pipeline, had turned off an alarm that would have notified them of the leak as they were dealing with a separate problem with a pump.
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Figure 2: About 19,000 gallons of crude oil spilled into the street in eastern Los Angeles on May 15, 2014. It is believed to have been caused by valve failure, according to Plains All American Pipeline, who shut it off shortly after being contacted, but because the oil was under pressure, it continued to spill for 45 minutes.
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[http://america.aljazeera.com/blogs/scrutineer/2014/5/16/faulty-valve-eyedinlaspillthatcreatedlakeofcrudeoil.html]

Figure 3: The Mayflower oil spill occurred on March 29, 2013, when the Pegasus Pipeline owned by ExxonMobil ruptured and released about 134,000 gallons of heavy crude. In sealed depositions, Mayflower residents described illnesses, property damage, and a smell that haunted them for years. Some say they felt pressured to sign settlements. [https://en.wikipedia.org/wiki/2013_Mayflower_oil_spill] [https://insideclimatenews.org/news/24102019/exxon-oil-spill-neighborhood-mayflower-arkansas-sealed-depositions-illnesses-fines/]

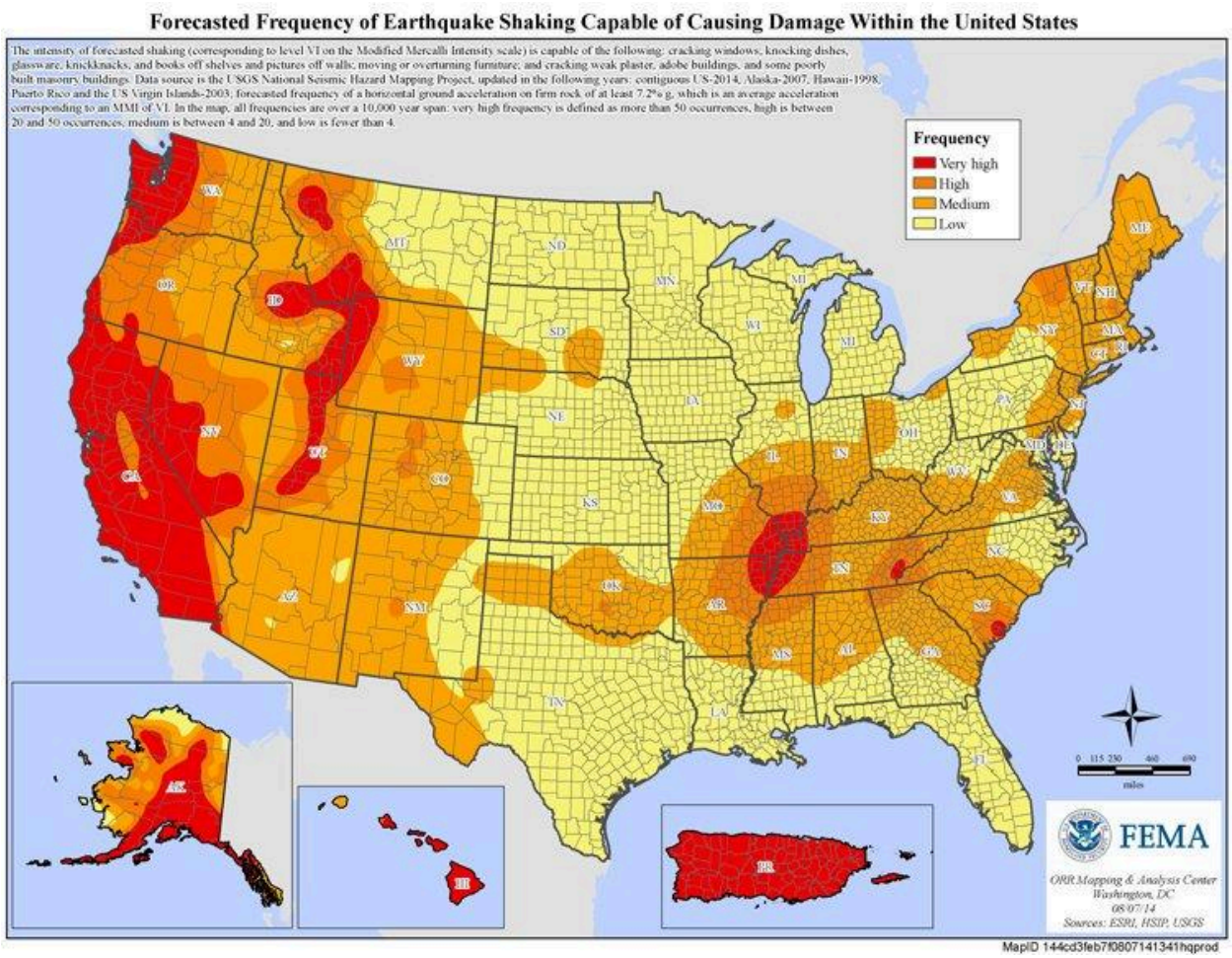

Figure 4: A picture is worth a thousand words. It must be noted that all the other risks presented in this document and elsewhere, including the hydrogeological evaluation cited earlier, have not taken earthquake risk into account. Earthquake risk compounds all other risks by an order of magnitude.
[https://www.fema.gov/sites/default/files/2020-07/fema_p1085_earthquake_2017.pdf]

We have a history of incremental additions to the miles of pipelines we own, both through acquisitions and investment capital projects. We have also increased our terminal and storage capacity and operate several facilities on or near navigable waters and domestic water supplies. Although we have implemented programs intended to maintain the integrity of our assets (discussed below), as we acquire additional assets we are at risk for an increase in the number of releases of liquid hydrocarbons into the environment. These releases expose us to potentially substantial expense, including clean-up and remediation costs, fines and penalties, and third-party claims for personal injury or property damage related to past or future releases. Some of these

significant. See "Environmental — General" in Note 19 to our Consolidated Financial Statements. In addition, despite our pipeline and facility integrity management efforts, we can provide no assurance that our pipelines and facilities will not experience leaks or releases or that we will be able to fully comply with all of the federal, state and local laws and regulations

Excerpts from Plains All American Pipeline 2020 annual report (SEC form 10-K).

The principal environmental risks associated with our operations are emissions into the air and releases into the soil, surface water, or groundwater. Our operations are subject to extensive environmental laws and regulations, including

We are subject to operational risks and our insurance may not be sufficient to cover all potential losses arising from operating hazards. Failure by one or more insurers to honor their coverage commitments for an insured event could materially and adversely affect our financial position, results of operations, and liquidity.

Excerpts from Valero Energy Corp. 2020 annual report (SEC form 10-K).

Figure 5: Excerpts from the latest annual reports filed by Plains All American Pipeline and Valero Energy Corporation with the SEC.
[https://sec.report/Document/0001070423-21-000008/]
[https://sec.report/Document/0001035002-21-000051/]

Figure 6: Three-year stock price chart of Valero (down 13%) versus S&P 500 (up 40%).

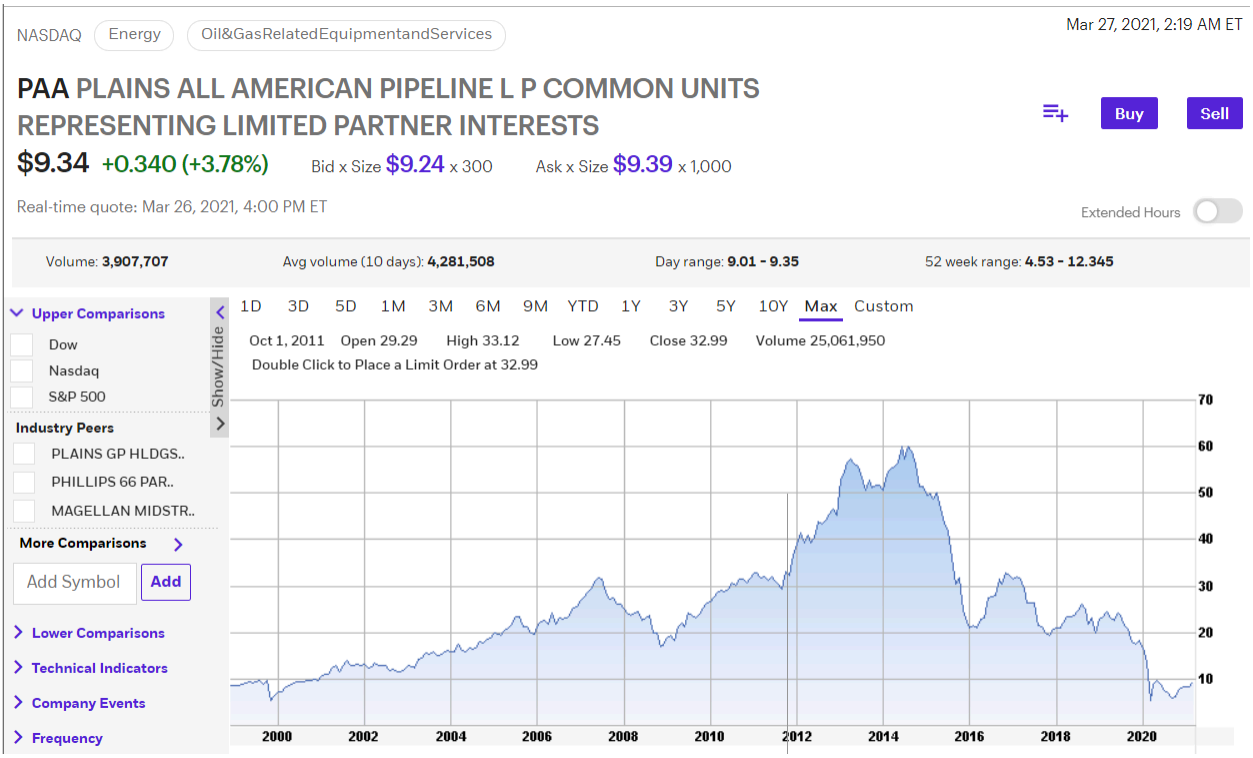

Figure 7: This chart shows that during the last six years, Plains All American Pipeline has relinquished all the gains in its market value that it accrued over the previous fifteen years and its current valuation is below where it started in 1998. It has lost 85% of its value from its peak in 2014.