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Jason Cashman Port of Stockton
Port of Stockton Commissioners
2201 West Washington Street
Stockton, California 95203
Via email to ceqa@stocktonport.com

Re: Port of Stockton BayoTech Hydrogen Production and Dispensing Facility Project; Recirculated Initial Study/Mitigated Negative Declaration

Dear Mr. Cashman and honorable Port Commissioners,

As outlined in previous comments[1] with local coalition partners, Restore the Delta requests that a full environmental impact report (EIR) be conducted for the proposed BayTech Hydrogen Production and Dispensing Facility Project. New technologies being sited at the Port necessitate a higher level of scrutiny to ensure environmental protections and community benefit. There is potential for significant environmental impacts even after proposed mitigation measures have been fully implemented.

Moreover, as this is the first Hydrogen Production Project at the Port of Stockton, we believe it's especially important to get this first project right. Restore the Delta evaluates emerging technologies for the region in terms of community health, first, and community wealth, second. In other words, we want to ensure that the most effective strategies for decreasing air pollution and greenhouse gas emissions, keeping workers safe, reducing energy demand, and protecting water quality are implemented within new industries situated at the Port of Stockton before developing community benefits programs that will help to reverse the environmental damage from past decades within communities surrounding the Port. This letter is offered in the spirit of crafting a consistent path forward for best practices and standards for Port and industry leadership in advancing this developing industry and for ensuring that the Port is making the best investment decisions for its own long term operations.

We add to our previous comments points of emphasis below.

The Port of Stockton can prioritize clean, economically viable, community-centered alternatives for hydrogen production. We applaud the Port of Stockton's exploration of alternative energy industries to fuel stationary and mobile fuel cell power applications within the Port and for area commercial and industrial customers. In particular, we commend the Port's embrace of Zero Emissions Vehicle transition

[1] July 2023 letter submitted to Port commissioners, led by Delta Sierra Group of the Sierra Club

strategies to "displace the need for petroleum fuels and reduce dependency on foreign fuels". We also appreciate new language in the updated initial study/mitigated negative declaration confirming the Port's requirement of BayoTech to develop and implement a community benefits agreement with local community groups. Unfortunately, BayoTech's hydrogen production project would be an annual net emitter of over 10,000 tons of CO2e while only producing 700 tons of hydrogen per year. This project will use diesel trucks to transport hydrogen generated from natural gas, with no plans detailed for carbon capture and storage or meaningful mitigation measures with tangible local air quality benefits to an already heavily overburdened community. Gray hydrogen is not a profitable enterprise for our local economy or environment. Steam methane reforming (SMR), the proposed technology for the project, emits 10-14 kilograms of CO2e per kilogram of hydrogen[2] – well above the threshold of eligibility for proposed federal hydrogen tax credits (45V)[3]. BayoTech's ineligibility for federal climate incentives is especially concerning, since the company appears to be hesitant to negotiate revenue sharing agreements with community members without significant public funding footing the bill.

To achieve greater environmental, economic, and community benefits, the Port can prioritize cleaner, more profitable and efficient methods of hydrogen production. Green hydrogen is poised to become cost-competitive[4] with traditional fossil-based methods, thanks to new federal tax subsidies. The Inflation Reduction Act offers a 10 year tax credit for "clean hydrogen" production facilities (45v Clean Hydrogen Production Tax Credit). Draft guidelines for 45v, which currently give green hydrogen a $2 to $3/kg subsidy advantage over its gray and blue counterparts, respectively, are expected to be finalized in the coming months. Investing in green hydrogen now is a win-win strategy: even if green hydrogen is still prohibitively expensive after the 45v tax credits have expired, the Port will have enabled a massive build-out of renewable energy sources that can be used for other purposes.

For comparison, the climate benefits of various methane-derived hydrogen production methods are predicated on eliminating methane leaks in the supply chain and in the conversion process, reliably capturing a high amount (90%+) of CO2 generated from the facility, and storing that CO2 safely underground in saline aquifers (i.e. blue hydrogen). It's worth noting that the few SMR plants that currently use carbon capture and sequestration (CCS) are quoted as achieving 50-60% capture rates. Additionally, the CO2 stream from burning methane onsite to power SMR is much more expensive and difficult to capture. If geologic CO2 storage is demonstrated for safety and viability in the Delta, the Port should work with community stakeholders to carefully evaluate a wider variety of methane-derived approaches (e.g. partial oxidation, autothermal reforming, etc.) to determine whether steam methane reforming is truly the best technology fit for climate benefits, local pollution reductions, and energy and cost efficiency.

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[2] International Energy Agency. "Towards hydrogen definitions based on their emissions intensity" (April 2023)

[3] The tax credit goes up to $3 per kilogram of hydrogen that's produced with less than 0.45 kilograms of carbon dioxide or its equivalent — but can go as low as 60 cents per kilogram of hydrogen that has emitted between 2.5 and 4 kilograms of CO2.

[4] According to the International Energy Agency, for regions with abundant renewable resources, using renewable electricity to produce hydrogen is set to be "the most cost-effective option, even before 2030."

We take issue with the GHG and criteria air pollutant accounting for the project, given a number of issues the study fails to consider.

- **By using Book-and-Claim Credits for Renewable Natural Gas (RNG), BayoTech's project has failed to commit to *locally beneficial* GHG mitigation measures**. BayoTech plans to procure RNG "book-and-claim" credits through California's Low Carbon Fuel Standard (LCFS) to reduce the facility's lifecycle carbon intensity to below 10,000[5] MT of CO2e annually. There are three problems with this approach. First, RNG Book-and-Claim credits would not guarantee a reduction of GHGs (or criteria air pollutants) in the San Joaquin Valley Air Basin, since eligible LCFS credits for "avoided methane emissions" currently include out-of-state manure lagoons. Second, the climate benefits of LCFS dairy biomethane credits are drastically overstated and unreliable; since many eligible credits have been generated by out-of-state dairies that installed digesters before LCFS was enacted, there is no way to prevent biomethane producers from claiming credit for the same GHG reduction in other settings. Additionally, LCFS biomethane credits incentivize the consolidation of large industrial dairies that pollute groundwater and air quality in environmental justice communities in the San Joaquin Valley, rather than regulating for more geographically appropriate cattle and manure management approaches to reduce methane emissions and address sanitary and contamination risks. Third, increasing demand for methane undermines California climate goals (California's Short-Lived Climate Pollutant Reduction Strategy mandates a 40% methane emissions reduction by 2030 through efforts to divert organic waste from landfills, clean up dairy and livestock manure management practices, and reduce fugitive methane emissions from oil and gas). Instead of using ineffectual book-and-claim credits, a more environmentally responsible option would be for BayoTech to acquire RNG from local sources onsite, however, the cost of RNG would increase the overall cost of the project. The monthly and annual reports of RNG purchase records and overall fuel consumption that BayoTech would be required to provide the Port through the Mitigation Monitoring and Reporting Program (MMRP) system should be transparent and available for public review on-line.

- **Methane emissions associated with increased use of natural gas or RNG across the full supply chain should be accounted for and mitigated.** Upstream and midstream emissions of methane and CO2 in natural gas production are responsible for a significant portion[6] of the total emissions from natural gas-based hydrogen production. The MND did not provide mitigation measures for monitoring, reporting, and verifying fugitive methane emissions directly upstream of the facility (i.e. the new natural gas distribution line that would serve the project), meaning that even the immediate upstream methane impact, which should be the most straightforward to estimate, remains unknown. BayoTech should fund the installation of a community air quality monitoring network to detect fugitive methane plumes in upstream pipeline infrastructure and

[5] Threshold of significance for GHGs set by South Coast Air Quality Management District in 2008, which has been adopted by some other air districts, but not by the San Joaquin Valley Air Pollution Control District

[6] 1-5 kg CO2-eq/kg H2 out of total 10-14 kg CO2-eq/kg H2, according to the International Energy Agency

provide real-time reports in a publicly accessible geospatial database. We recognize that fugitive and operational methane emissions farther upstream, such as natural gas processing plants, storage facilities, and transmission pipelines, are not the sole responsibility of BayoTech. However, BayoTech should consider limiting its procurement to local biomethane sources and working with community advocates and environmental experts to hold upstream RNG producers and distributors (i.e. PG&E) accountable to funding robust methane mitigation (e.g. monitoring, maintenance and repair of supply mains, feeder mains, and distribution mains; landfill interconnections; and large natural gas storage sites) and corresponding workforce development needs in consultation with area labor unions and worker support groups.

- **To provide a comprehensive GHG impact analysis, a full EIR is needed to account for hydrogen leakage downstream of the facility, and implications for local air quality impacts and global warming potential. BayoTech should also submit and comply with a hydrogen emission management plan that verifies end uses (e.g. documentation of offtake agreements), work with community-based vendors to measure hydrogen emissions with advanced sensors verified by the US Department of Energy's National Energy Technology Lab, and mitigate downstream leakage risks with locally beneficial mitigation measures.**

    - Hydrogen is a potent short-lived, indirect greenhouse gas; when released directly into the atmosphere, hydrogen can increase concentrations of existing GHGs (e.g. atmospheric levels of methane, tropospheric ozone, and stratospheric water vapor)[7]. Given its small molecular size, hydrogen is extremely difficult to confine and is emitted throughout the value chain from both operational releases and downstream leakage. Due in part to uncertainties with measuring hydrogen emissions, environmental groups have petitioned the US EPA to list and establish hydrogen production facilities as a stationary source category under Clean Air Act sections 111 and 112 and develop protective national emission standards under both sections to limit climate-destabilizing and health-harming air pollution from new and existing facilities.

    - The updated study now includes estimates of hydrogen leakage from BayoTech's facility (0.144 kg/yr., per "system tests") and corresponding Global Warming Potential (GWP), however, both require a more thorough analysis.

        - **More details are needed to characterize BayoTech's plans to minimize leakage at the facility.** BayoTech has provided additional details on their plans for minimizing facility hydrogen leakage, including "use of pressure sensors, which detect pressure loss in production equipment, compression systems, ground storage pods, and filling facilities; use of gas and flame detection, which involves using thermal and optical sensors to detect natural gas or hydrogen leaks and flames; automated control and shutdown systems that isolate the affected system; and valve testing to the Canadian Standards Association

[7] Warwick et al. (2023); Sand et al. (2023); Derwent et al. (2023); Hauglustaine et al. (2022)

(CSA)/American National Standards Institute (ANSI) Fuel System Components for Hydrogen Vehicles Hot Gas Valve (HGV) 3.1 standards (2015)." Sensors with the speed and sensitivity necessary to quantify hydrogen emissions at levels below the threshold for hydrogen gas flammability are not widely available. We implore BayoTech to procure more advanced sensor technologies – measuring 10 parts per billion with a 10 second response time or less – as they become commercially available. In the meantime, we implore BayoTech to 1) work with the community to participate in advanced sensor demonstration projects to more accurately measure hydrogen emissions at its facility and downstream and 2) to implement more robust measures to minimize leakage, mitigate operational emissions, and mitigate operational repair emissions.

- **More accurate accounting is needed for downstream hydrogen leakage and related transport impacts.** The Port should exercise more scrutiny in verifying hydrogen end uses, since associated emissions of GHGs and criteria air pollutants could vary significantly. The study misleadingly states that "hydrogen fuel generates power using a chemical reaction rather than combustion"; this is true if hydrogen is consumed in a fuel cell, however, hydrogen can also be directly combusted, resulting in NOx emissions. The study's estimated CO2e avoidance potential of replacing diesel equipment with hydrogen does not appear to account for transport emissions or downstream leakage. BayoTech intends to "distribute zero-carbon hydrogen to customers throughout the region via compact transport trailers." While "most of the hydrogen" produced at the site will be used within 25-100 miles of the port, it can "go as far as 200-300 miles." These descriptions fail to specifically detail both the quantity to be used and the type of end use within 25-100 miles of the port and beyond, leaving to the lead CEQA agency's imagination whether the hydrogen will be used as a feedstock for industrial chemicals synthesis or oil refining; combusted; or converted to electricity in a stationary or mobile fuel cell. Because BayoTech plans to use trucks to transport gaseous hydrogen, a very flammable gas that burns invisibly and can cause explosions, communities deserve more transparency on where hydrogen will be transported, and whether it will be used as a fuel or feedstock. Since there are zero hydrogen refueling stations located in San Joaquin County, and the nearest *planned* mixed use stations to the Port appear to be 30 to 40 minutes away (in Galt and Livermore, respectively), we are highly doubtful that BayoTech is prioritizing hydrogen end uses that will produce meaningful air quality benefits in San Joaquin County. The Port should disclose offtake agreements for hydrogen produced at BayoTech's production facility to verify end uses, including whether hydrogen demand at adjacent port facilities is expected to be addressed in full by the facility.

- **The Global Warming Potential of hydrogen leakage cited in the study needs to be updated in alignment with latest science.** BayoTech should estimate CO2e using 20-year GWP value. Hydrogen's atmospheric warming effects only last a few decades, and the next 20 to 30 years will be some of the most critical for bringing global atmospheric GHG concentrations back into balance to stave off the worst, irreversible impacts of climate change. The study, however, only cites a 100-year GWP for hydrogen of 5.8. Notably, 5.8 is still an underestimate for hydrogen's 100-year GWP, since the latest consensus, based on advancements in chemistry-climate modeling, is closer to 11.6.

Once an EIR has been conducted and GHGs and criteria air pollutants associated with the project are properly accounted for, BayoTech should prioritize investment in *local* demand side solutions for mitigating methane emissions to offset the one percent increase in total natural gas usage in San Joaquin County that would otherwise result from the project. Mitigation measures that can improve energy affordability and ensure *local* air quality benefits include demand reduction measures (e.g. home weatherization) and avoidance measures (e.g. conversion of commercial and residential buildings from natural gas to electricity, efforts to divert organic waste from landfills, etc.).

We support and appreciate tremendously the Port of Stockton's exploration of alternative energy industries to reduce local air pollution impacts, create local quality jobs, and position the Port as a global leader on new climate innovations. We question the financial viability of the BayoTech hydrogen production and dispensing facility proposal, due to the high costs of natural gas and RNG, ineligibility for 45v tax credits, and excessive costs of future carbon capture on an SMR unit as compared to other hydrogen production methods. Additionally, we hope our concerns with GHG and air criteria pollutant accounting can be addressed and standardized as a best practice for future hydrogen proposals at the Port of Stockton.

Sincerely,

Davis Harper
Carbon Program Manager

Barbara Barrigan-Parrilla
Executive Director