

Dale Lutz

NOTE: The attached file is a copy of this comment, but with hyperlinks included, and a more readable format.

I believe this project shows that the Solid Waste Management policy team should broaden their thinking and scope to simply "Waste Management." I feel the plan presented is not "complete," because some key opportunities are not discussed.

Page 36 of the Environmental Assessment Worksheet (EAW) states in part:

"The MPCA's Metropolitan Solid Waste Management Policy Plan 2022 – 2042 (MPP)⁵ applies to the Project." ...

"The goals of the MPP are to:

- Manage materials in a manner that will protect the environment and public health, REDUCE GHG EMISSIONS, conserve energy and natural resources, and reduce toxicity and exposure to toxics" [Emphasis added.]

On page 67, Table 13 estimates the project would produce the following GHG (greenhouse gas) emissions: Carbon Dioxide Equivalent (CO₂e) (anthropogenic) 5,597 tpy [short tons per year], and CO₂e (biogenic) 28,361 tpy.

While page 75 states that, for some reporting purposes, "Biogenic GHG emissions are allowed to be excluded as per MPCA guidance," slowing global warming requires reducing or delaying ALL greenhouse gas emissions, regardless of the source of the "carbon". Thus, this project is expected to release a total of about 34,000 tons of carbon dioxide GHG per year.

The best way to "reduce GHG emissions" is to STOP EMITTING CO₂ GHG!

I am a retired Ph.D. chemist and a Ramsey County resident whose food waste would be sent to the proposed Dem-Con HZI anaerobic digester. Since 2006 I have been very concerned about global warming and climate change caused by CO₂ greenhouse gas emissions. I dread the thought of my grandsons living in a hellscape in the year 2100, looking back at us and saying, "You saw this coming, and you did nothing to stop it!" For the past 17 years I have searched for the best ways to reduce the amount of CO₂ in the atmosphere. I have helped on several Department of Energy R&D contracts addressing this issue.

As the articles below show, CO₂ can be captured and "utilized" to produce multiple useful products, including construction aggregate for concrete, concrete curative, and "electrofuels" like methanol, ethanol, and sustainable aviation fuel (SAF). The anaerobic digester plan could, for example, include capturing and using the CO₂ with demolition concrete from the adjacent Dem-Con landfill to produce construction aggregate for sale.

Fulfilling the Promise of Carbon Capture and Utilization

<https://www.bcg.com/publications/2024/four-applications-of-carbon-capture-and-utilization>

Carbon dioxide mineralization in recycled concrete aggregates can contribute immediately to carbon-neutrality (See, e.g., Fig. 1)

<https://www.sciencedirect.com/science/article/pii/S0921344922002798>

This CO₂ mineralization would help compensate for the CO₂ emissions from the limestone (CaCO₃) that will be mined at the site by Bryan Rock Products Inc. The limestone will almost certainly be cooked in a kiln to produce lime (CaO) for cement, thus releasing the carbon that has been sequestered in the mineral (CaCO₃ => CaO + CO₂).

The CO₂ from the plant's flare and stacks could be captured, for example, using the Chart Industries' Cryogenic Carbon Capture technology described in the article below. Chart Industries also supplies cryogenic transport trailers for hauling the liquid CO₂ produced by truck to a point of use.

Cryogenic Carbon Capture

<https://www.chartindustries.com/Products/Carbon-Capture>

As part of the cryogenic capture process, the gas cooling also condenses the water vapor that was released in the combustion or gasification process. This water could be used in place of much of the well water currently required by the plan. If we assume, for example, that each carbon atom in the biomass in the anaerobic digester is accompanied by at least 2 hydrogen atoms, 34,000 tons per year of CO₂ would be accompanied by the release of about 3.3 million gallons of water per year. Page 52 says, "The expected water consumption for the Project will be about 3.8 million gallons per year, with the potential for 8.8 million gallons per year in the worst-case scenario." Substituting pure condensed water vapor for precious aquifer water would support the MPP goal of conserving natural resources.

I am working with my state representative on a bill to have the legislature fund a design study for building a state-owned facility that would combine captured CO₂ with "green hydrogen" to produce sustainable aviation fuel (SAF) for the MSP airport. This SAF would displace fossil fuels. The "green hydrogen" would be produced from water electrolyzers using dedicated low-carbon renewable energy, like wind and solar (plus storage). An example of a commercial system is shown in the article below.

Infinium's Project Pathfinder is World's First Fully Operational eFuels Facility

<https://www.infiniumco.com/news/infiniums-project-pathfinder-is-worlds-first-fully-operational-efuels-facility>

Including technologies like those described above in the Dem-Con HZI Bioenergy plan can move Minnesota closer to being a "circular economy."

Dem-con HZI Bioenergy (Shakopee) – Environmental Assessment Worksheet Comments

Dale R. Lutz, Ph.D., Maplewood, MN – 7/31/2024

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