Summary of Public Review Comments and Responses:
Draft *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2022*

July 2024
U.S. Environmental Protection Agency
Office of Atmospheric Programs
Washington, D.C.

Responses to Comments Received during the Public Review Period on the *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2022*

Preface

EPA thanks all commenters for their interest and feedback on the annual *Inventory of U.S. Greenhouse Gas Emissions and Sinks*. Per Federal Register Notice 2024-01658 published on February 14, 2024, EPA announced document availability and request for comments on the draft "Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2022" report. The EPA requested recommendations for improving the overall quality of the inventory report to be finalized in April 2024 and submitted under the United Nations Framework Convention on Climate Change (UNFCCC) and the Paris Agreement, as well as subsequent inventory reports.

During the 30-day public comment period which ended March 15, 2024, EPA received 10 sets of comments, including 13 unique comments in response to the notice. This document provides EPA's responses to technical comments on methods and data used in developing the annual greenhouse gas inventory. The verbatim text of each comment extracted from the original comment letters is included in this document, organized by commenter. Full comments can be found in the public docket here:https://www.regulations.gov/docket/EPA-HQ-OAR-2024-0004. EPA's responses to comments are provided immediately following each comment excerpt.

Commenter: Earthjustice, Friends of the Earth, and National Wildlife Federation

EPA Docket ID No.: EPA-HQ-OAR-2024-0004 *(Note: Complete comment with all citations/footnotes is available at docket link noted in preface.)*

Comment 1: EPA should expand agricultural economic sector emission estimates, validate its models for estimating methane emissions using direct measurements, include GHG emissions calculated according to 2-year global warming potentials (GWPs) in parallel with 100-year GWPs to match policy discussions, and prioritize reducing uncertainty in estimates of methane and nitrous oxide emissions from agriculture.

The Environmental Protection Agency's ("EPA") Inventory of U.S. Greenhouse Gas Emissions and Sinks ("Inventory") is a key source of estimates for the country's greenhouse gas emissions across numerous sectors. The Inventory is cited widely, demonstrating that it forms the foundation of policymakers' and the public's understanding of the country's emissions. And the Inventory has a significant impact, as it helps policymakers evaluate our progress toward the Paris Agreement's critical goal of limiting global warming to two degrees Celsius. It also informs policymaking, lawmaking, and scientific research. Given the Inventory's influence, it is essential that its estimates are complete, accurate, and not misleading.

EPA must make several improvements to the Inventory's estimates for agricultural emissions to ensure that the Inventory shows the full extent of agriculture's contribution to climate change. As discussed below, agriculture is the country's leading source of methane and nitrous oxide emissions and, unlike emissions from other sources, agricultural emissions are growing. But the Inventory's estimates of agricultural emissions are incomplete and uncertain, causing it to downplay agriculture's role in the climate crisis and mislead policymakers and the public about the importance of reducing agricultural emissions.
Accordingly, we urge EPA to:

a. expand the agricultural economic sector emission estimates to reflect a more complete accounting of agricultural emissions;
b. validate its models for estimating methane emissions using direct measurements of methane emissions from agriculture;
c. include greenhouse gas emissions calculated according to 20-year global warming potentials ("GWPs"), in parallel with 100-year GWPs, to match policy discussions; and
d. prioritize reducing uncertainty in its estimates of methane and nitrous oxide emissions from agriculture.

I. Agriculture is a large and growing source of greenhouse gas emissions.

As the Inventory shows, agriculture is the country's largest anthropogenic source of methane and nitrous oxide, two greenhouse gases with tremendous warming impacts. Unlike other emission sources—including natural gas, landfills, and coal mining, which have made progress in curbing or slowing the growth of their emissions—agricultural emissions have generally trended upward since 1990. Thus, agricultural emissions are of growing importance and will continue to jeopardize our ability to meet climate targets without aggressive mitigation measures.

Methane emissions from animal agriculture, which account for 36 percent of total anthropogenic methane emissions,5 have increased since 1990. In particular, methane emissions from enteric

fermentation—a digestive process in cows and other ruminant animals that produces methane as a by-product—rose from 183.1 to 192.6 MMT CO_2eq (million metric ton carbon dioxide equivalents) between 1990 and 2022.6 Methane emissions from manure management grew from 39.1 to 64.7 MMT CO_2eq during the same period.

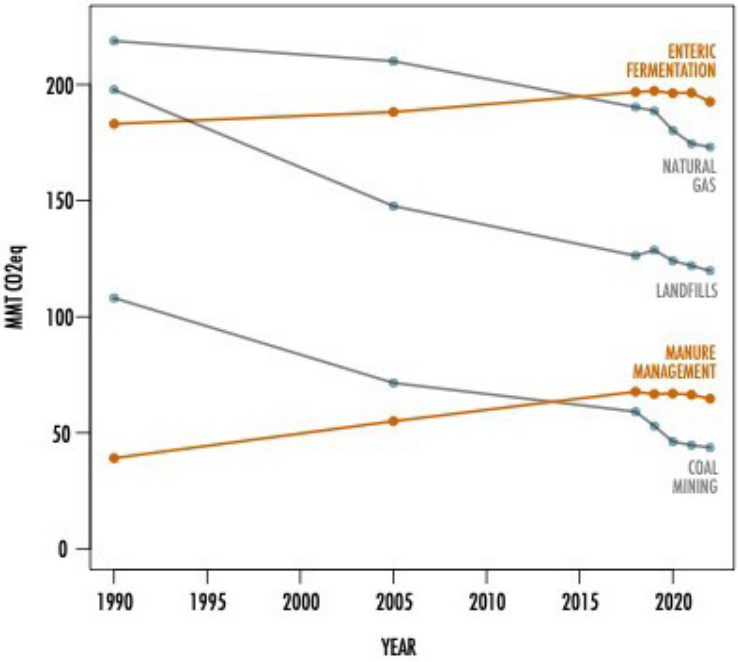

Figure 1: Trends in U.S. anthropogenic methane emissions between 1990 and 2022.

Similarly, nitrous oxide emissions from agricultural soil management, which account for 75 percent of anthropogenic nitrous oxide emissions,8 have either trended upward or failed to decrease meaningfully since 1990. Direct soil nitrous oxide emissions rose from 258.8 to 262.5 MMT CO_2eq between 1990 and 2022. These direct soil nitrous oxide emissions include emissions from synthetic fertilizer use on cropland, which rose from 61 to 62 MMT CO_2eq. And indirect soil nitrous oxide emissions failed to decrease significantly, going from 29.9 to 28.3 MMT CO_2eq between 1990 and 2022.

II. EPA should improve the completeness and accuracy of the Inventory's estimates of agricultural emissions.

1. EPA should expand the agricultural economic sector emission estimates to reflect a more complete accounting of agricultural emissions.

EPA should expand the agricultural economic sector emission estimates to include emissions from sources closely associated with agriculture. In addition to estimates based on Intergovernmental Panel on Climate Change ("IPCC") sectors, the Inventory includes estimates by economic sector. The agricultural economic sector estimates provide a more complete accounting of agricultural emissions, as they include emissions from on-farm fuel and electricity use. Including emissions from these sources increases agricultural emissions from 593.4 to 632.7 MMT CO_2eq. However, the sector still fails to include emissions from many sources that are crucial components of agricultural production, which

misleads policymakers and the public about the sector's contributions to climate change. To further improve the completeness of the agricultural economic sector estimates, EPA should include the following sources, all of which are closely associated with agriculture and generate substantial greenhouse gas emissions:

- Fertilizer manufacturing

  While the agricultural economic sector includes greenhouse gas emissions from fertilizer use, it does not account for fertilizer manufacturing, which releases methane and carbon dioxide. Indeed, a recent study estimated that synthetic nitrogen fertilizer manufacturing in the U.S. is responsible for 40.2 MMT CO_2eq. The Food and Agriculture Organization ("FAO") predicts that synthetic fertilizer use will increase by about 50 percent between 2012 and 2050, meaning that emissions from fertilizer manufacturing also will increase significantly, making it all the more important that EPA account for the emissions.

- Pesticide manufacturing and use

  Pesticides generate greenhouse gases during their manufacture and use, yet none of these emissions are included in the agricultural economic sector emission estimates. For example, studies estimate that the production of herbicides generates between 18.22 and 26.63 kilograms of CO_2eq per kilogram of herbicide, the production of insecticides generates between 14.79 and 18.91 kilograms of CO_2eq per kilogram of insecticide, and the production of fungicides generates between 11.94 and 29.19 kilograms of CO_2eq per kilogram of fungicide. A single pesticide manufacturer, Syngenta, reported that its operations produced 9.8 MMT CO2eq in 2021. Pesticide use also generates emissions, as some pesticides, like the fumigant sulfuryl fluoride, are themselves greenhouse gases, and pesticides also interact with the environment to produce greenhouse gases.

- Aquaculture and fisheries

  The agricultural economic sector emission estimates also overlook greenhouse gas emissions from aquaculture and fisheries. A recent study by the FAO of emissions from aquaculture estimated that production of nine of the main cultured aquatic species in North America generated 1,188 kilotons of CO_2eq. The study also noted that aquaculture production is increasing rapidly. And a study of emissions from fisheries estimated that North American fisheries were responsible for 10 MMT CO_2eq. Another study found that just one common industrial fishing method—bottom trawling— generates as much carbon dioxide annually as the aviation industry.

- Agricultural land use

  Although the Inventory accounts for emissions from agricultural land use in the IPCC sector on land use, land-use change, and forestry, those emissions are not included in the agricultural economic sector estimates. The Inventory estimates that converting land to cropland is responsible for 35.1 MMT CO_2eq. This is about the same level of emissions as on-farm fossil fuel combustion, yet it is missing from the agricultural economic sector emission estimates

- Carbon opportunity cost of agricultural land use

Neither the Inventory nor the agricultural economic sector estimates accounts for the carbon

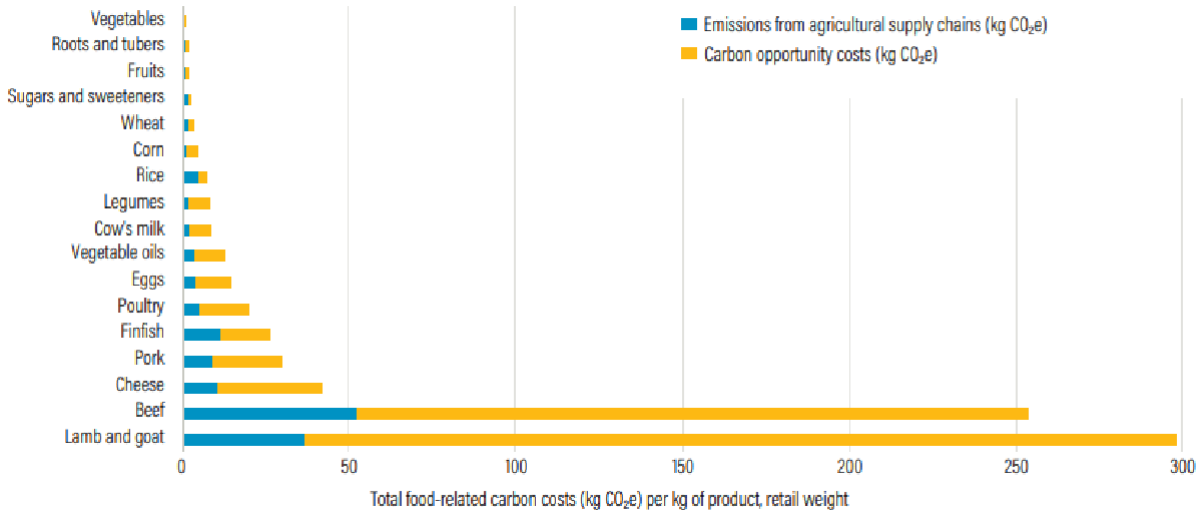

Figure 2: Supply chain emissions and carbon opportunity costs of various foods.

opportunity cost of agricultural land use, a measure of how much carbon land could sequester if, rather than being used for agricultural production, it reverted to native vegetation. However, EPA has recognized that carbon opportunity costs can be included in estimates of emissions from land use changes. Figure 2 demonstrates the significant carbon opportunity costs associated with various foods.

- Food waste

  The agricultural economic sector emission estimates also fail to account for greenhouse gas emissions from food waste. A recent report by EPA cited a study estimating that greenhouse gas emissions associated with food waste amount to 170 MMT CO_2eq per person annually. This is equivalent to more than the emissions of 42 coal-fired power plants or 36 million vehicles each year.

As the magnitude of the emissions from these sources makes clear, including them in the agricultural economic sector is necessary to present a complete picture of agriculture's immense climate impact.

Response: EPA notes this comment to further disaggregate the agricultural economic sector and will review the feasibility of updating the current economic sector analysis to provide additional disaggregation incorporating the LULUCF sector to the extent possible. While not disaggregated for specific manufacturing industries, EPA also notes that the manufacturing emissions from combustion are reported under the industrial sector in Chapter 3-Energy (see pp. 3-20). Process emissions during manufacture of chemicals are reported under Chapter 4-Industrial Processes and Product Use (see pp. 4-2 through 4-5).

Comment 2: EPA should validate its models for estimating agricultural methane emissions by using direct measurements of methane emissions from agriculture.

EPA should validate its models for estimating agricultural methane emissions with the following studies, which collect direct measurements of these emissions and indicate that actual emissions are much higher than EPA's estimates in the Inventory:

- Matthew N. Hayek & Scot M. Miller, *Underestimates of Methane from Intensively Raised Animals could Undermine Goals of Sustainable Development*, 16 Env't Rsch. Letters 63006 (2021).

  Emission estimates can be corroborated using atmospheric measurements taken above and downwind of industrial animal operations, and in the U.S., animal methane emissions may be 39 to 90 percent greater than EPA's estimates.

- Scot M. Miller et al., *Anthropogenic Emissions of Methane in the United States*, 110 Proceedings Nat'l Acad. Sci. 20018 (2013).

  A combination of comprehensive atmospheric methane observations, extensive spatial datasets, and high-resolution atmospheric transport modelling suggests that EPA's inventory underestimated methane emissions nationally by a factor of approximately 1.5 and that emissions due to enteric fermentation and manure management are up to twice the magnitude of existing inventories.

- Kevin J. Wecht et al., *Mapping of North American Methane Emissions with High Spatial Resolution by Inversion of SCIAMACHY Satellite Data*, 119 J. Geophysical Rsch. 7741 (2014).

  Satellite observations paired with chemical transport modeling suggest that U.S. livestock emissions are 40 percent greater than estimated according to EPA's inventory and that U.S. livestock emissions are 70 percent greater than oil and gas emissions, in contrast to comparable values in EPA's inventory.

- Alexander J. Turner et al., *Estimating Global and North American Methane Emissions with High Spatial Resolution Using GOSAT Satellite Data*, 15 Atmospheric Chem. & Physics 7049 (2015).

  Space-borne methane observations indicate that U.S. anthropogenic methane emissions are approximately 1.5 times greater than as reported in EPA's inventory, with 29 to 44 percent of emissions attributed to livestock.

Similarly, the following regional studies of direct agricultural methane emissions also suggest that emissions are significantly higher than the estimates in the Inventory:

- Megan E. McCabe et al., *Technical Note: Isolating Methane Emissions from Animal Feeding Operations in an Interfering Location*, 23 Atmospheric Chem. & Physics 7479 (2023).

  Measures of methane emissions collected via aircraft from above concentrated animal feeding operations suggests that actual emissions per head of cattle may differ substantially from coefficients used by EPA to estimate methane emissions based on cattle inventory.

- Seongeun Jeong et al., *Estimating Methane Emissions in California's Urban and Rural Regions Using Multitower Observations*, 121 J. Geophysical Rsch. 13,031 (2016).

Atmospheric observations of methane emissions in California suggest values 1.2 to 1.8 times greater than those reported by the California Air Resources Board.

- Zichong Chen et al., *Source Partitioning of Methane Emissions and its Seasonality in the U.S. Midwest*, 123 J. Geophysical Rsch. 646 (2018).

  Anthropogenic methane emissions in the midwestern U.S. were observed to be 1.5 times greater than the estimates from EPA's inventory, and livestock sources were underestimated by 1.8-fold in the inventory.

- Xueying Yu et al., *Aircraft-based Inversions Quantify the Importance of Wetlands and Livestock for Upper Midwest Methane Emissions*, 21 Atmospheric Chem. & Physics 951 (2021).

  Airborne measurements across seasons in the U.S. corn belt and upper midwest indicate that livestock emissions in the summer and winter are 25 percent higher than predicted in EPA's inventory, with particularly large discrepancies of 30 to 40 percent for dairies and hog farm estimates.

- Levi M. Golston et al., *Variability of Ammonia and Methane Emissions from Animal Feeding Operations in Northeastern Colorado*, 54 Env't Sci. & Tech. 11015 (2020).

  Observations at mobile laboratories in Colorado show large discrepancies between measured methane and ammonia plumes downwind of confined animal feeding operations and model predictions.

Taken together, these studies provide strong evidence that the Inventory underestimates agricultural methane emissions. EPA should integrate these existing direct measurements and explore opportunities for improving direct measurements, including through the use of novel remote sensing technologies, to validate and refine its models.

Response: EPA is continuously assessing currently used and other available methods, models and data to develop accurate emissions and reduce uncertainty. EPA is familiar with the referenced studies and, consistent with the 2019 IPCC Refinements, uses them where we can identify over- and under-estimates as much as possible. Additionally, EPA has recently updated the U.S. Gridded Methane Emissions product: https://www.epa.gov/ghgemissions/us-gridded-methane-emissions. These estimates will make it easier for atmospheric scientists to conduct future studies linking methane observations to specific emissions sources.

Across the agriculture and LULUCF estimates, time-series data, including population, are validated by experts to ensure they are representative of the best available U.S.-specific data. EPA also works closely with the U.S. Department of Agriculture to improve estimates for livestock methane emissions in order to better reflect ongoing livestock management practices. EPA's work with across the interagency through the implementation of the GHGMMIS federal strategy and the U.S. GHG Center will also encourage improvements in the underlying livestock activity data and research into the use of atmospheric observations to identify opportunities to improve the accuracy of source-specific inventory emissions estimates.

Comment 3: EPA should include greenhouse gas emissions calculated according to 20-year GWPs, in parallel with 100-year GWPs, to match policy discussions.

EPA should present greenhouse gas emissions in the Inventory using both 100-year and 20-year GWPs, as many scientists urge. To compare the global warming impacts of various greenhouse gases, scientists use GWPs, which represent the amount of heat absorbed by a single unit of a greenhouse gas over a specified timeframe. The Inventory relies solely on a 100-year GWP, representing the climate impact of a greenhouse gas distributed across a century. This choice has a significant impact on the Inventory's calculation of methane emissions, as the GWP of methane is 28 at 100-year timescales and 86 at 20-year timescales. In other words, using 100-year GWPs weights methane emissions nearly three times less than 20-year GWPs. And, since methane remains in the atmosphere for about 12 years on average, this choice also obscures methane's tremendous near-term impact on the climate. While methane accounts for 11 percent of U.S. greenhouse gas emissions with a 100-year GWP, it rises to 28 percent when its impact is analyzed using a 20-year GWP.

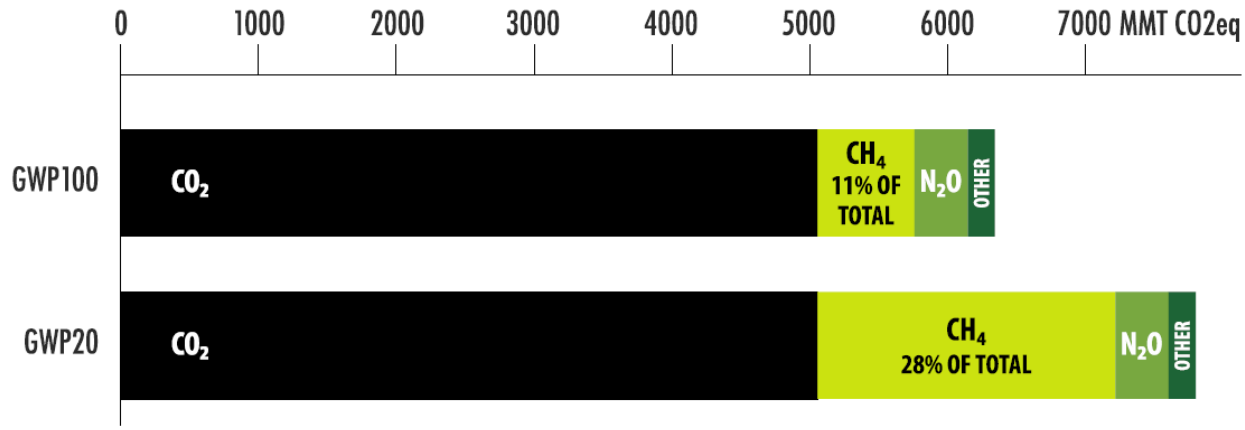

Figure 3. *Greenhouse gas emissions calculated according to 100-year and 20-year GWPs.*

Reporting greenhouse gas emissions using both 100-year and 20-year GWPs would provide more relevant data for policymakers, whose work often occurs on the scale of years or decades rather than centuries.It would also comply with the IPCC directive to tailor GWP choices to their appropriate policy contexts. And it would align with similar state-level reporting, such as in New York state's greenhouse gas inventory and in its climate planning.

Response: EPA uses 100-year Global Warming Potentials (GWP) from IPCC's Fifth Assessment Report to calculate CO_2 equivalent emissions as required for reporting annual inventories under the UNFCCC and the Paris Agreement. This is required to ensure that national GHG Inventories reported by all nations are comparable. See page ES-3 of the Executity Summary to the Inventory report here: https://www.epa.gov/system/files/documents/2024-04/us-ghg-inventory-2024-chapter-executive-summary_04-16-2024.pdf.

The U.S. Inventory also includes unweighted estimates in kilotons (see Table 2-2 of the Trends chapter) and stakeholder/researchers can and have used these values to apply other metrics. Further, Annex 6 of the Inventory includes information on effects to inventory estimates in shifting to AR5 and AR6 100-year GWPs. The U.S. Inventory report website is available at https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks. More

information on GWPs is available on the IPCC's Working Group 1 website for AR5 (Chapter 8) and for AR6 (Chapter 7) online at https://www.ipcc.ch/working-group/wg1/

Comment 4: EPA should prioritize reducing uncertainty in its estimates of methane and nitrous oxide emissions from agriculture.

EPA should prioritize reducing the uncertainty ranges for agricultural emissions, which are among the largest in the Inventory. For example, for methane emissions from enteric fermentation, the 95 percent confidence interval—that is, the range of values within which there is a 95 percent likelihood that the true value falls—spans from 11 percent below to 18 percent above the estimate. For methane emissions from manure management, the confidence interval ranges from 18 percent below to 20 percent above the estimate. Even more concerning, the confidence interval for direct soil nitrous oxide emissions is only constrained to ± 28 percent of the estimate, and the interval for indirect soil nitrous oxide emissions ranges up to 123 percent above the estimate. By contrast, the confidence interval for carbon dioxide emissions from natural gas ranges from just 1 percent below to 5 percent above the estimate.

Given that agricultural emissions are already high and growing, it is critical that EPA improve the precision of these estimates. EPA has made only marginal improvements in the uncertainties over the past few years, so it must prioritize them going forward. Without accurate estimates for agricultural emissions, policymakers do not know the true extent to which agriculture is driving climate change and, thus, may not take the steps necessary to reduce its emissions.

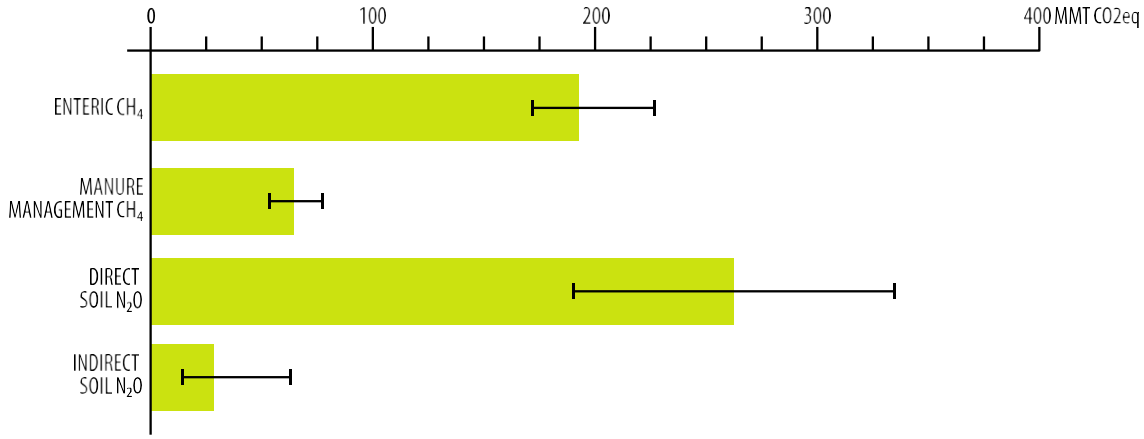

Figure 3: Agricultural greenhouse gas emissions with 95 percent confidence intervals.

* * *

The Inventory is a key component of the country's efforts to understand and address its greenhouse gas emissions. Given the Inventory's influence, it is essential that its estimates of agricultural emissions are accurate, complete, and not misleading. To ensure that the Inventory reflects agriculture's true climate impacts, EPA must make the improvements described.

Response: EPA agrees with commenter, consistent with IPCC good practice, that improving the inventory includes reducing uncertainty ranges as far as practicable, in particular for significant

sources that are the focus of these comments. This is a priority for EPA and collaborating agencies. The agriculture sector poses unique challenges in improving the activity data and emissions estimations models that underly many source categories within the agriculture sector in the absence of entity-scale reporting for agricultural sources of emissions.To this end, EPA is currently working on updates to the uncertainty analysis which will involved updating uncertainty parameters and the Monte Carlo simulation to accompany recent updates, as documented in the Planned Improvements sections for the following categories, for example, Enteric Fermentation (Page 5-11), Manure Management (Page 5-21), and Agricultural Soil Management (Page 5-47). This is a multi-year update and EPA will report on progress/publish results in future inventories.

Commenter: World Resources Institute

EPA Docket ID No.: EPA-HQ-OAR-2024-0004 *(Note: comment with complete graphics/citations/footnotes is available at docket link noted in preface.)*

Dr. Mike Badzmierowski | U.S. Agricultural Policy, Manager

Comment 5: The section on manure management inaccurately reflects current strategies in dairy and swing. The current assumptions used by EPA significantly underestimate manure in liquid systems and therefore significantly underestimate emissions. The comment provides revised estimates for manure management system distribution and resulting emissions. The commenter welcomes further discussion.

It has come to my attention that it appears the methodology used to determine greenhouse gas (GHG) emissions from manure management is significantly miscalculated. The U.S. EPA Inventory states, "The percent of waste by system was estimated using the USDA (U.S. Department of Agriculture) data broken out by geographic region and farm size…Starting in 2016, EPA estimates dairy WMS based on 2016 USDA Economic Research Service (ERS) Agricultural Resource 15 Management Survey (ARMS) data."

It is my understanding that the U.S. EPA distributed estimates with some emphasis on amount of manure in each management strategy. However, the estimates of your distribution do not appear to match this approach and significantly underestimates dairy cow manure in liquid-based manure management systems. Figure 1 shows U.S. EPA's estimated distribution of manure management strategies for dairies based on region. The West region in your estimate suggests less than 43% of the manure is in anaerobic lagoon or digesters. However, we know that California has 48.3% of West dairy cows of which more than 90% are in the San Joaquin Valley and are nearly all on flush systems with anaerobic lagoons. This means 43.5% of cows in the West region, without considering all other West region states, are on anaerobic lagoons and digesters. Revisions must be made to increase the proportion of dairy cows in anaerobic lagoons. This is probably why the California Air Resources Board consistently has estimated their dairy manure management emissions to be higher than U.S. EPA's GHG Inventory.

Figure 2 shows our (World Resources Institute) estimated dairy manure management systems by region which accounts for significant increases in liquid-based manure management systems. We assumed conservatively based on 2022 Census of Agriculture that farms with greater than 1,000 dairy head used anaerobic lagoons.iii Dairy cow populations in known operational anaerobic digesters by end of 2022 were accounted for via the AgSTAR database (same as U.S. EPA but still resulted in different values).iv Dairy cows in digesters were subtracted from the estimated dairy cows in anaerobic lagoons. Farms with

a dairy cow head count between 200 and 999 were assumed to be liquid slurry or deep pit systems. Farms with <200 dairy cows were assumed to be dry manure management systems and we used the allocation proportion estimated by EPA for the various dry systems.

Swine also appears to have significantly less in liquid-based manure management systems than what is typical. Specifically, large swine operations in the South typically use anaerobic lagoons.v Despite this fact, the U.S. EPA Inventory suggests only 25% of the hog manure in the South is in anaerobic lagoons and anaerobic digesters. We provide a rough estimate based on size and location of swine farms. For all locations we assumed farms with <200 hogs were in a dry solid storage system and farms with a hog population between 200 and 999 were assumed to be in a liquid slurry system. Farms with >1,000 hogs were assumed to be in a deep pit system if in the Midwest/North and in an anaerobic lagoon if in the

South. Hogs in operating anaerobic digesters by end of 2022 were accounted using the AgSTAR database. Our hog distribution is approximate to the simulations done by Putman et al. (2015).v Figures 3 and 4 gives U.S. EPA and our estimated hog manure management systems distribution by region.

We have provided a revised GHG manure management inventory for dairy and swine. Figures 5 and 6 show the estimated dairy cow and swine populations in each manure management system in each region. Using all the same equations and factors in the U.S. EPA Inventory, we show in Figures 7 and 8 comparisons of total GHG emissions from dairy cow and heifer and swine manure management. The latest U.S. EPA GHG Inventory methodology update uses IPCC AR5 GWP100 metric and values. We have provided these values and the more representative values to compare using updated IPCC AR6 GWP20 values (AR6 GWP 100 values are similar to AR5 GWP100 values used by U.S. EPA). Our dairy emissions estimate is 56.3 MMT CO_2e (AR5 GWP100) compared to U.S. EPA value of 39.6 MMT CO_2e, an increase of over 42%. Swine emissions in our estimates increased by nearly 36%, going from the U.S. EPA estimate of 25.6 MMT CO_2e (AR5 GWP100) to our WRI estimate of 34.7 MMT CO_2e. Looking further at the methane emissions from dairy cows, in Figure 9, **we find that methane emissions from manure management is 1.37 times more than methane emissions from dairy cow enteric fermentation** (54.3 MMT CO_2e for dairy cow manure management compared to 39.7 MMT CO2e for dairy cow enteric fermentation).

By adjusting only these two animal types, our estimates suggest manure management emissions would be 107.6 MMT CO_2e versus U.S. EPA's estimate of 81.8 MMT CO_2e.

I understand that this adjustment would require more details, but we are open to discussion on how we can help improve accounting to reflect current manure management strategies more accurately and the resulting GHG emissions.

Response: As described in the Inventory documentation, estimated manure management systems usage is based on USDA surveys (page 5-15 and see Annex 3.11). These surveys ask a representative group of farmers about on-farm manure management. The survey data are provided by farm size, and EPA uses farm size data from the USDA Census of Agriculture to develop an overall estimate of manure management in the United States. The manure management estimates used in the Inventory have undergone multiple reviews by USDA, academic, and industry manure management experts. Specifically, regarding USDA data and anaerobic lagoons, the 2016 Dairy ARMS data and the manure management experts, indicated that other manure management systems are in use even on larger farms in the West. EPA continues to review the latest available data for use in the Inventory to reflect the industry trends.

EPA is also investigating whether trends in swine systems in the South are moving away from the use of anaerobic lagoons. The Putnam reference cited also states there has been a decrease in lagoon use since the early 2000s. The 2009 Hog ARMS data agrees that solid storage is effectively not in use but does not agree that anaerobic lagoons are the only system used in the South for large operations. The 2009 Hog ARMS data agrees that smaller systems are more likely to use dry systems, that medium sized facilities tend towards liquid slurry systems, but seems that larger systems may be split between deep pit and lagoon systems. That said, the data do not indicate a black and white cut off for system use that the analysis assumptions indicate.

EPA will reach out to the commenter for further discussion to understand the commenter's perspective on how the data do not match the approach described. EPA will continue to assess the opportunity to enhance clarity in the chapter text.

Commenter: Private Citizen

EPA Docket ID No.: EPA-HQ-OAR-2024-0004

Pike Porter

Comment 6: EPA should count CO_2 emissions from wood combustion.

The EPA must begin counting CO_2 from wood combustion and not continue to pretend that burning wood is carbon neutral. It's shameful.

Response: EPA does not assume a priori in the Inventory that burning biomass is carbon neutral. The inventory is not the tool to assess the impacts of burning a unit of biomass - that requires an expanded analysis as outlined, for example, in the EPA's Framework for Assessing Biogenic CO2 Emissions from Stationary Sources (see: https://cfpub.epa.gov/si/si_public_record_report.cfm?Lab=OAP&dirEntryID=308343).

As described in the Inventory Final Report (see pg. 3-127), the combustion of biomass—such as wood, charcoal, the biogenic portions of MSW, and wood waste and biofuels such as ethanol, biogas, and biodiesel—generates CO_2 in addition to CH_4 and N_2O. The CH_4 and N_2O generated from biomass combustion are accounted for as part of combustion emission reporting in the Energy Chapter of the Inventory.

In line with the reporting requirements for inventories submitted under the UNFCCC, CO_2 emissions from biomass and biofuel combustion have been estimated separately from fossil fuel CO_2 emissions and are not directly included in the energy sector contributions to U.S. totals. Therefore, CO_2 emissions from biomass and biofuel consumption are not included specifically in summing energy sector totals. However, they are presented for informational purposes and to provide detail on biomass and biofuels consumption. Biomass CO_2 emissions from combustion are presented in the Energy Chapter Section 3.10 of the Inventory for informational purposes (see pg. 3-127).

In accordance with IPCC methodological guidelines, emissions from biomass burning are calculated by accounting for net carbon fluxes from changes in biogenic C reservoirs in wooded or crop lands. For a more complete description of this methodological approach, see the Land Use, Land-Use Change, and Forestry chapter (Chapter 6), which accounts for the contribution of any resulting CO_2 emissions to U.S. totals within the Land Use, Land-Use Change, and Forestry sector's approach. Additional detail can be

found on the IPCC FAQs page (please see question Q2-10): https://www.ipcc-nggip.iges.or.jp/faq/faq.html.

Commenter: Interstate Natural Gas Association of America (INGAA)

EPA Docket ID No.: EPA-HQ-OAR-2024-0004

Scott Yager | Vice President, Environment

Comment 7: INGAA supports EPA's methodology updates for estimating methane emissions from natural gas transmission and storage (T&S) assets, as well as updating AD methodology to estimate transmiss compressor station counts and compressor counts.

EPA provided a notice of availability of planned 2024 updates to the U.S. Greenhouse Gas (GHG) Emissions Inventory annual report ("GHGi Annual Report") in the February 14, 2024 Federal Register,1 and requested comment on the draft document. The Interstate Natural Gas Association of America ("INGAA"), a trade association representing the interstate natural gas pipeline industry, respectfully submits these comments in response to EPA's request.

INGAA member companies transport more than 95 percent of the nation's natural gas, through approximately 200,000 miles of interstate natural gas pipelines. In 46 of the 48 contiguous United States, INGAA member companies operate over 5,400 natural gas compressors at over 1,300 compressor stations and storage facilities along the pipelines to transport natural gas to local gas distribution companies, industrials, gas marketers, and gas-fired electric generators. This includes over 3,500 stationary natural gas-fired reciprocating engines, 1,500 combustion turbines, and 300 electric motors that drive the compressors. INGAA's comments focus on the transmission and storage ("T&S") segment inventory, particularly EPA's request for feedback on potential changes to activity data for T&S sources.

For estimating methane emissions from natural gas T&S assets, EPA is proposing two key methodological changes in this year's report:

1. An update to the methods used to estimate transmission compressor station counts and compressor counts – key activity data (AD) used for estimating leak and blowdown emissions, which are significant contributors to total T&S methane emissions; and,

2. Adding event-specific emissions associated with large release events that occurred from underground natural gas storage (UNGS) wells. This addition supplements EPA's decision several years ago to include year-specific emissions from a large emissions event that occurred at the Aliso Canyon storage field in California in late 2015 and early 2016. In response, EPA added emissions from that event to the 2015 and 2016 annual inventories. The proposed change would add emissions from nine other storage facility events that have occurred since 1990 based on information in a 2022 paper supplemented with EPA analysis.

INGAA supports EPA's update to the AD methodology to estimate transmission compressor station counts and compressor counts

INGAA supports EPA's proposed changes to the AD methodology and believes that FERC and PHSMA data and the proposed approach in the 2024 GHGi Annual Report are better proxies for annual scaling of AD than other data sources or the method EPA has used in recent years.

The method selected for the 2024 draft report follows an approach generally recommended by INGAA in previous comments – i.e., relying on public data available from industry reports submitted to the federal government (FERC and/or PHMSA). The time series relies on the original AD from the mid-1990s EPA/GRI study and uses data reported to FERC or PHMSA to estimate year-to-year changes. Subpart W data is used for additional details such as differentiation between compressor types.

The AD methodology update significantly reduces station and compressor counts for transmission and results in emissions more than 10% lower for those sources. INGAA believes this is an appropriate correction, because year-to-year scaling of these AD in recent years over-estimated compressor and station counts, and thus over-estimated leak and blowdown emissions from compressor stations. Since these sources comprise a significant portion of total T&S emissions, the total annual inventory is about 10% lower. Review of the emission estimates in EPA's excel file shows that nearly all of the decreases in estimated emissions from the 2023 GHG Annual Inventory Report to the 2024 Annual Inventory Report are due to this update in transmission compressor station and compressor count AD, because that AD is directly used to calculate facility and compressor leak emissions and facility blowdown emissions.

INGAA has no comment at this time regarding the proposed update for reporting large release events associated with UNGS wells.

INGAA appreciates EPA's continued effort to improve the GHGi and believes that the AD methodology change EPA is proposing will improve the agency's estimates of T&S sector emissions. My contact information is below.

Response: EPA notes the above comments expressing support for methodological updates to estimate transmission compressor station counts and compressor counts.

Commenter: American Petroleum Institute (API)

EPA Docket ID No.: EPA-HQ-OAR-2024-0004

Jose Godoy | Policy Advisor, Climate and ESG Policy

Comment 8: API supports the continued use of the Greenhouse Gas Reporting Program (GHGRP) for petroleum systems-related revisions. For Abandoned Oil and Gas Wells, EPA should clarify how estimation methods for emissions from abandoned oil and gas wells remained consistent across the time series, and review and incorporate data from the Interstate Oil and Gas Compact (IOGCC) for greater accuracy.

The American Petroleum Institute (API) appreciates the opportunity to review and provide comments on the Public Review Draft of the U.S. Environmental Protection Agency (EPA) 2024 Greenhouse Gas Inventory (GHGI).

API represents all segments of America's oil and natural gas industry. API was formed in 1919 as a standards-setting organization. In our first 100 years, API has developed more than 700 standards to enhance operational and environmental safety, efficiency, and sustainability. Our members produce, process, and distribute most of the nation's energy. Many of our members will be directly impacted by how GHG emissions from their operations are presented in the national GHGI.

API supports timely and accurate reporting and transparency by the oil and natural gas industry – and all other emitting sectors of GHG emissions – through EPA's GHG Inventory (GHGI). API seeks to ensure that emission estimates used to construct the GHGI are based on the highest-quality and most current data

available, reflect actual industry practices and activities, and are technically correct. API has consistently participated in EPA's stakeholders' process and expert review phases of the GHGI development process, providing comments and recommendations on the agency's proposed methodologies. API appreciates these opportunities to engage with EPA and is eager to continue supporting EPA in their development of robust, well-constructed GHGI.

API's comments below provide feedback on the changes presented in the public review draft and on information EPA is seeking from industry along with additional input to inform the proposed updated methodologies for the Petroleum Systems, Natural Gas Systems, and Abandoned Oil and Gas Wells sections of the energy chapter of the draft GHGI.

3.6 Petroleum Systems

In the draft 2024 GHGI, EPA used additional basin-level data reported under Subpart W of the GHGRP to calculate basin specific emission factors and activity factors for several emission sources in the onshore production segment. This includes pneumatic controllers, equipment leaks, chemical injection pumps, and storage tanks. API supports the continued use of the Greenhouse Gas Reporting Program (GHGRP) to inform revisions of emission and activity factors associated with petroleum systems used in calculating emissions data for the GHGI.

3.7 Natural Gas Systems

For the natural gas systems source category, EPA also implemented updates that incorporate additional basin level data from GHGRP Subpart W for several emission sources in the onshore natural gas production segment, including for pneumatic controllers, equipment leaks, chemical injection pumps, storage tanks, and liquids unloading. For each of these emission sources, EPA modified the GHGI calculation methodology to use GHGRP data to develop basin-specific activity factors and/or emission factors. API supports the continued use of the GHGRP to revise emission and activity factors associated with natural gas systems.

3.8 Abandoned Oil and Gas Wells

EPA's updated GHGI methodology to estimate abandoned well emissions incorporates abandoned well counts and plugged and unplugged fractions at the state level to estimate GHG emissions. In the draft GHGI, EPA references their state level annual counts of abandoned wells for 1990 through 2022 which are based on an annual estimate of abandoned wells in the Enverus data set (Enverus 2023). To develop the number of abandoned wells not included in the Enverus dataset, EPA relied on historical records collected by state agencies and the United States Geological Survey. API requests that in the final GHGI, EPA clarify how the estimation method for emissions from abandoned oil and gas wells is consistent across the entire time series to ensure the accuracy of the well counts.

In addition, API recommends that EPA review and incorporate data provided by the Interstate Oil and Gas Compact Commission (IOGCC) into the GHGI to establish a more accurate count of idle and orphan wells in the US. API also recommends that EPA utilize the IOGCC as a resource to help inform the regulatory structures in place to ensure proper plugging and maintenance of idle and orphan wells.

Conclusion

API appreciates EPA's willingness to work with industry to improve data used for the national inventory and encourages EPA to continue these collaborative discussions.

API supports EPA's use of the GHGRP data in the development of the GHGI and in further advancing how carbon capture and sequestration is characterized by using industry data collected through the GHGRP's Subpart RR and the proposed Subpart VV. API further recommends that EPA continue to strive for consistency and harmonization when incorporating other data sets outside of the GHGRP as it further develops the GHGI methodologies.

API appreciates the opportunity to comment and looks forward to further engage with EPA to support the implementation of enhanced methodologies that reflect critical advances in greenhouse gas emission reductions.

Response: EPA notes the above comments, including support for developing basin-level approaches using GHGRP data for Natural Gas and Petroleum systems onshore production emissions sources. EPA confirms that the abandoned wells methodology is consistent for each state and across the time series. As correctly summarized by the commenter, the abandoned well counts in a given year equal the number of abandoned wells estimated from Enverus for that year and state plus an historical estimate of abandoned wells for a state. Please refer to page 3-118 of the Inventory Report and the 2018 Abandoned Wells Memo for discussion of the methodology and time series consistency. EPA also acknowledges the data provided by the Interstate Oil and Gas Compact Commission (IOGCC) for idle and orphan wells. EPA has previously reviewed an earlier version of the IOGCC report on idle and orphan wells and will continue to review IOGCC data in future inventory cycles.

Commenter: National Council for Air and Stream Improvement, Inc. (NCASI)

EPA Docket ID No.: EPA-HQ-OAR-2024-0004

Steve Prisley | Principal Research Scientist
Hector Restrepo | Senior Research Scientist

Comment 9: NCASI supports the Planned Improvements in LULUCF, particularly dissemination of open-source code for improved transparency and clarity of forest carbon estimates. They suggest clarifying tables, date references, calculation descriptions, and source updates within the chapter.

We appreciate the opportunity to comment on the Draft U.S. Greenhouse Gas Inventory Report (1990-2022). The National Council for Air and Stream Improvement, Inc. (NCASI; https://www.ncasi.org) serves forest landowners, managers, and the forest products sector as a center of excellence for technical information and rigorous scientific research to achieve the sector's environmental goals and principles. As such, our comments are restricted to Chapter 6, on Land Use, Land-Use Change, and Forestry.

General Comments

We appreciate the significant improvements in the science behind the inventory in this report. Noteworthy improvements include estimates of aboveground live tree carbon in forests resulting from the US Forest Service's National-Scale Volume and Biomass (NSVB) equations, including species specific carbon fractions. In addition, improved modeling of forest soils and litter have resulted in more accurate estimates of these forest carbon pools.

Furthermore, we are encouraged by the "Planned Improvements" section of the report. The topics noted include leveraging U.S. Forest Service Forest Inventory and Analysis (FIA) data and remotely-sensed data, evaluating alternative estimators, attribution of fluxes to activities, and natural disturbances. We agree that efforts in these areas will make for a more accurate inventory and better understanding of forest carbon dynamics in general. Dissemination of open-source code will be a welcome step to improve transparency and clarity of estimates of forest carbon stocks and fluxes. Additional research and improvement of estimates of belowground biomass is critical and represents perhaps the largest source of uncertainty (and the least supported by extensive field sampling or investigations) of all forest carbon pools.

Specific Comments

We respectfully offer the following notes on specific passages within the document that we believe would improve clarity and understanding of this extensive and complex report.

1. Tables 6-2 and 6-3. These tables are somewhat confusing in combination. It appears that Table 6-3 reports in kilotons of individual gasses while 6-1 reports in million metric tons of CO2 equivalents. If this is the case, then we'd expect to see comparable numbers within the CO2 section of these tables (as has been the case in previous Inventory reports). However, an example discrepancy is that Table 6-2 reports 2022 carbon stock change for forest remaining forest as 787 MMT CO2e, while Table 6-3 reports the same value as 695,354 kt of CO2. Further explanation of these differences would be helpful.

2. Page 6-8, line 8 reports carbon stock changes in 2023; should this be 2022?

3. Page 6-29, lines 8-10 reports that carbon density "was calculated by dividing the forest land area estimates by forest ecosystem carbon stock estimates". This should likely be reversed – dividing carbon stocks by area.

4. Page 6-48, lines 14-15 note that fertilization data in this report came from two decades ago. There are more current sources of data on trends in silvicultural treatments in managed, private forests (such as Forisk).

5. Page 6-54, lines 6-12 are a duplication of a portion of lines 13-21.

6. Page 6-67, bottom of Box 6-4, the three-sigma rule would correspond with a confidence interval of 99%; two-sigma would be 95%.

In conclusion, we are encouraged by improvements in the data used for this report and suggest some minor editing will improve the report.

Response: EPA appreciates the commenter flagging inconsistencies with draft tables and has updated the report accordingly for the Final Inventory (see Tables 6-1 through 6-3 found on pages 6-4 through 6-8). See other text edits (page 6-29; 6-54), as applicable, have been implemented.

Commenter: American Wood Council (AWC)

EPA Docket ID No.: EPA-HQ-OAR-2024-0004

Rachael Jamison | Vice President, Markets & Sustainability

Comment 10: AWC supports EPA's decision to maintain aggregate reporting of forest land net carbon stock, and advocates for the utilization of tools like environmental product declarations to assess emissions associated with harvesting and hauling wood.

The American Wood Council (AWC) appreciates this opportunity to provide the below comments in respond to EPA's request for comments on the Draft Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2022. 89 Fed. Reg. 11275 (February 14, 2024).

AWC is the voice of North American wood products manufacturing, an industry that provides over 450,000 men and women in the United States with family-wage jobs. AWC represent 86 percent of the structural wood products industry. Our members make products that are essential to everyday life that are derived from a domestic renewable resource that stores carbon for many decades. Our staff experts develop state-of-the-art engineering data, technology, and standards for wood products to ensure their safe and efficient design, as well as provide information on wood design, green building, and environmental regulations.

As the federal government already recognizes, working American forests represent an existing and powerful nature-based solution to climate change while simultaneously providing a range of important ecosystem services such as habitat preservation, biodiversity, watershed protection, water resources, flood control, and more. Working forests deliver real climate benefits as carbon is sequestered both in working forests themselves and the wood products derived from those forests. In addition to providing numerous environmental benefits, working forests provide socioeconomic benefits by supporting recreational opportunities, wood products industries, and good-paying rural jobs.

AWC strongly supports EPA's decision to continue to report on aggregate estimates for forest land net carbon stock change as done in previous years in accordance with IPCC guidelines. We urge EPA to continue to resist suggestions to complicate the U.S. inventory by disaggregating forestry-related emissions and removals data that, taken out of context, might misrepresent the net impact of managed forest activity on U.S. forest carbon stocks.

We concur with EPA's April 2023 response to comments , in which EPA concluded that its current practice of aggregating information about logging and clearing into its estimates for forest land net carbon stock is in alignment with the scope and purpose of a national GHG Inventory, and that more granular attention to individual forces that impact carbon stock changes is beyond the scope and purpose of such an inventory.

We support continued reporting of forest carbon stock and harvested wood product carbon pools at the aggregate level, based on data compiled using regional boundaries that have long been used by the Forest Service, to allow for the efficient compilation of meaningful data to help assess overall national trends that are the focus of the IPCC guidelines and the purpose of national inventory reporting.

There are many other more appropriate tools and data sources available to identify the emissions associated with harvesting for the wood products sector. For example, the U.S. wood products sector has developed numerous environmental product declarations (EPDs) in conformity with international standards (ISO 14025, 14040, 14044, and 21930) that account for all relevant value chain emissions

associated with covered wood products, including harvesting and hauling. These EPDs provide information about life-cycle emissions, and also demonstrate significant climate benefits of such products. Additionally, the sector is developing regional EPDs in conformance with ISO 21930 to account for emissions associated with logging, hauling, and related working forest activities. These regional EPDs will also affirm the climate benefits associated with wood extracted from working American forests.

AWC also notes that post-wildfire logging, and proper forest management that involves logging, significantly reduces the amount of woody fuel that causes large-magnitude wildfires.

AWC appreciates this opportunity to support EPA's continued aggregate reporting of forest land net carbon stock in the Draft Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2022 and in future iterations of the national inventory.

Response: EPA has noted AWC's comments. EPA also clarifies that the Inventory has no direct role in informing environmental product declarations.

Commenter: Save The World's Rivers (formerly named "Save The Colorado")

EPA Docket ID No.: EPA-HQ-OAR-2024-0004

Gary Wockner | Director, Save The Colorado
Hans Cole | Director of Environmental Programs and Advocacy, Patagonia
Matt Stoecker | Owner, Stoecker Ecological
Mark Easter | Independent Consultant

Comment 11: Concern that methodology understates emissions

Hello EPA, This year's inventory shows no change in, or correction to, the methods or implementation relative to the previous year's inventory about the GHG emissions from dams and reservoirs in the U.S.. Because of this, our comments from the previous year's inventory still stand, and we attach them again. We look forward to seeing the implementation of the tier 2 method for reservoir surface emissions that EPA staff are preparing. See resubmitted comment here: https://www.regulations.gov/comment/EPA-HQ-OAR-2024-0004-0003

Response: See planned improvements outlined on pages 6-134. 6-144, 6-158, and 6-165. Many of these comments are being addressed as part of multi-year improvement work or are being assessed for future inventories. EPA has noted those previous comments and response here: https://www.epa.gov/system/files/documents/2023-07/US-GHG-Inventory-1990-2021-Public-Review-Comment-Log.pdf.

Commenter: National Association of Clean Water Agencies (NACWA)

EPA Docket ID No.: EPA-HQ-OAR-2024-0004

Cynthia A. Finley, Ph.D. | Director, Regulatory Affairs

Comment 12: NACWA requests that EPA improve methodologies in calculating nitrous oxide emissions and considering factors such as the presence of nitrification/denitrification (N/DN) processes and discharge points in aquatic environments; currently, EPA simplifies nationwide

emissions. Data on wastewater generation rates should also be updated to reflect water conservation efforts.

The National Association of Clean Water Agencies (NACWA) appreciates this opportunity to comment on the U.S. Environmental Protection Agency's (EPA) *draft Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2022 (Inventory), and specifically Section 7.2, Wastewater Treatment and Discharge (CRF Source Category 5D)*, as part of the public review process.

NACWA represents the interests of over 350 publicly owned wastewater treatment agencies nationwide, serving the majority of the sewered population in the United States. NACWA members want to ensure that greenhouse gas (GHG) emissions from wastewater treatment facilities are characterized appropriately in the Inventory. The wastewater treatment category includes publicly owned treatment works (POTWs), septic systems, and industrial wastewater treatment systems. NACWA's review and comments are focused on emissions from POTWs.

NACWA has submitted comments to EPA on the wastewater treatment section since the 2005 Inventory, and we appreciate the clarifications EPA has made over the years for the emissions calculations including the factors that are used in deriving the calculations. NACWA agrees with the Planned Improvements described in the current draft Inventory, many of which we have recommended in past comments. Since the 2022 Inventory only had minor adjustments from the previous year, NACWA's comments below reiterate the reasons these improvements should be made.

Although the *Inventory* reflects a national average for GHG emissions, and the methodology should not be used to calculate emissions from individual wastewater treatment facilities, the methodology used in the draft Inventory for nitrous oxide emissions unnecessarily simplifies nationwide emissions. EPA uses the 2019 Intergovernmental Panel on Climate Change (IPCC) guidelines to calculate emissions for the Inventory. Previous IPCC guidelines used different emissions factors depending on whether plants use nitrification/denitrification (N/DN) processes, with lower emissions resulting from plants without N/DN. These previous IPCC guidelines more accurately characterized the emissions of nitrous oxide from POTWs. EPA should use US-specific factors to account for the presence or absence of N/DN processes at different treatment plants. In addition, actual nitrous oxide emissions are process-specific, with factors such as consistency of dissolved oxygen levels, system upsets, and supplemental carbon addition sources potentially playing a large role in the quantity of nitrous oxide formed. Further refinements in emission factors should consider these factors.

NACWA also recommends that EPA focus on where wastewater discharges occur in the aquatic environment and how this affects GHG emissions. The current emissions factors apply to "estuaries," but further details describe "slow moving" aquatic systems. A large portion of wastewater discharges go to aquatic systems that are not "slow moving," since discharge points for POTWs are usually selected to meet water quality objectives and to target dilution and movement of the receiving water – conditions that are not conducive for producing GHG emissions. A better understanding of how emissions depend on the discharge points would produce more accurate emissions estimates.

Water conservation efforts continue to expand and improve in the United States, including the increased use of water-saving appliances, shower heads, and other fixtures. Many communities have significantly reduced their wastewater generation from the standard 100 gallons/capita/day value that is used in the Inventory. EPA should collect data on current wastewater generation rates and adjust the Inventory appropriately.

Thank you for your consideration of these comments. Please contact me at 202-533-1836 or cfinley@nacwa.org if you have any questions.

Response: See responses to similar comments submitted during previous reviews (response to on page 5 of https://www.epa.gov/system/files/documents/2023-07/US-GHG-Inventory-1990-2021-Public-Review-Comment-Log.pdf).

There are many factors affecting nitrous oxide emissions from wastewater treatment systems such as the temperature and dissolved oxygen concentration of the wastewater, and the specific operational conditions. EPA agrees that development of more specific emission factors based on type of system would be an improvement and will continue to evaluate available data. EPA is unlikely to develop emission factors that vary based on specific operating parameters at the more than 16,000 centralized treatment plants in the U.S. as we lack activity data to appropriately apply such factors. See also response to comment 56 on pp. 20-21 in https://www.epa.gov/system/files/documents/2021-07/us-ghg-inventory-1990-2019-expert-reviewcomment-log.pdf and response to comment 35 on page 33 in previous response https://www.epa.gov/system/files/documents/2022-06/us-ghg-inventory-1990-2020-public-reviewcomment-log.pdf

EPA notes the request to consider emissions associated with discharge to the aquatic environment. For nitrous oxide emissions, the IPCC Tier 3 emission factor is applied to discharges to waterbodies that are impacted for nutrients. The IPCC Tier 1 emission factor is applied to all other wastewater discharges. For 2022, EPA assumes 62 percent of centralized domestic wastewater is discharged to these "not slow moving" systems. For methane emissions, the two IPCC Tier 2 emission factors are used for discharges to reservoirs, lakes, and estuaries (0.114 kg CH4/kg BOD) and all other discharges (0.021 kg CH4/kg BOD). EPA acknowledges that the approach used to determine the approximate percent of waterbodies that are reservoirs, lakes, or estuaries was a high-level investigation and based on limited data and data sources. If the commenter is aware of a source that provides a quantitative estimation of POTW wastewater effluent discharged to the various waterbody types to provide context to a "large portion of wastewater" discharged to "not slow moving" aquatic system, EPA encourages the commenter and all other stakeholders to provide that source to further improve methane emissions estimates. See also response to comment #57 on p. 21 in response to previous comments: https://www.epa.gov/system/files/documents/2021-07/us-ghg-inventory-1990-2019-expert-reviewcomment-log.pdf and response to comment 35 on page 33-34 in previous response https://www.epa.gov/system/files/documents/2022-06/us-ghg-inventory-1990-2020-public-reviewcomment-log.pdf

Commenter: WhoPoo App

EPA Docket ID No.: EPA-HQ-OAR-2024-0004

Comment 13: EPA should recommend a total immigration moratorium to reduce emissions.

As cities destroy natural carbon sinks in favor of housing for illegal immigrants, the EPA should recommend a total immigration moratorium to reduce U.S. greenhouse gas emissions. Many Americans recognize the clear connection between mass immigration-driven population growth and growing threats to the environment. Nevertheless, the two issues are very rarely raised together, although the open borders lobby attempted to play the environmentalist card in its attempts to stop former president Trump's border wall construction. Moreover, most environmental organizations, which in the

past acknowledged the connection, have drifted towards open borders positions or simply prefer to remain silent on immigration, be it for ideological reasons or to avoid antagonizing powerful, pro-mass immigration donors.

Illustrating the environmental damage being inflicted is a short video released by Townhall senior writer Julio Rosas on Twitter, showing massive piles of trash – including dirty clothing, backpacks, and plastic bags – dumped by illegal aliens after entering the United States in the Yuma Sector of Arizona. Of course, this is nothing new (see here and here, for example).

As Reuters wrote back in 2012: "Trash tossed by thousands of illegal immigrants as they chase the American Dream has been a persistent problem for years in the rugged Arizona borderlands that lie on a main migration and smuggling route from Mexico." And logic dictates that the greater the volume of illegal border crossings, the more garbage gets dumped in the border areas.

FAIR has been warning about the impact of mass immigration on the environment and natural resources for decades. One recent report emphasized that "states like Florida are in grave danger of losing unique plant and animal species if future population growth is not carefully planned. Any legitimate discussion about conservation and protecting our environment must include an honest examination of how reckless immigration policies not only lead to inefficient urban planning, but also place our natural resources and sensitive ecosystems at risk." While this report focused specifically on Florida, similar situations are evident across the country.

FAIR also rated a broad swath of environmentalist groups, finding that "of the 25 organizations examined, 12 talked about overpopulation in general, but only 7 addressed it as a problem in the United States. However, while some groups did acknowledge immigration as a significant source of U.S. population growth, most shied away from advocating immigration reduction as a solution, with only two organizations recognizing the role that immigration has in population growth." By eschewing the mass migration "elephant in the room," these organizations are doing the U.S. environment and their own cause a disservice.

Hopefully, bona fide environmentalists will take heed and free themselves from the blinders imposed by the political agendas of many environmentalist organizations that either sympathize with mass immigration or simply ignore it. The surge of illegal immigration continues unabated, and 2022 will probably not be any better than 2021 given the Biden administration's refusal to stem the crisis, enforce our laws, and secure our borders. That undoubtedly means just as much, if not more, garbage littering the Southwest border, more feet and vehicles trampling delicate flora, as well as long-term environmental damage caused by rapid and unplanned population growth and urban sprawl. The growth of American forests is a snail pace -- just 0.03% year over year. If this rate doesn't increase, carbon sinks with mature trees will cease to be operable, and Americans will suffer from increased carbon in the atmosphere.

Response: EPA notes this comment is beyond the scope of the Inventory. For additional information see https://www.epa.gov/report-environment/wastes and https://www.epa.gov/landfills/municipal-solid-waste-landfills.