



**United States
Environmental Protection Agency**

FISCAL YEAR 2024

**Justification of Appropriation
Estimates for the
Committee on Appropriations**

Tab 04: Science and Technology

EPA-190-R-23-001

**March 2023
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Environmental Protection Agency
2024 Annual Performance Plan and Congressional Justification

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**Environmental Protection Agency
FY 2024 Annual Performance Plan and Congressional Justification**

**APPROPRIATION: Science & Technology
Resource Summary Table
(Dollars in Thousands)**

	FY 2022 Final Actuals	FY 2023 Enacted Operating Plan	FY 2024 President's Budget	FY 2024 President's Budget v. FY 2023 Enacted Operating Plan
Science & Technology				
Budget Authority	\$740,947	\$802,276	\$967,838	\$165,562
Total Workyears	2,005.4	2,022.0	2,265.7	243.7

*For ease of comparison, Superfund transfer resources for the audit and research functions are shown in the Superfund account.

Bill Language: Science & Technology

For science and technology, including research and development activities, which shall include research and development activities under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980; necessary expenses for personnel and related costs, for executive oversight of regional laboratories, and travel expenses; procurement of laboratory equipment and supplies; hire, maintenance, and operation of aircraft; and other operating expenses in support of research and development, \$967,838,000, to remain available until September 30, 2025.

**Program Projects in S&T
(Dollars in Thousands)**

Program Project	FY 2022 Final Actuals	FY 2023 Enacted Operating Plan	FY 2024 President's Budget	FY 2024 President's Budget v. FY 2023 Enacted Operating Plan
Clean Air and Climate				
Clean Air Allowance Trading Programs	\$8,360	\$7,117	\$19,983	\$12,866
Climate Protection	\$6,723	\$8,750	\$10,724	\$1,974
Federal Support for Air Quality Management	\$8,494	\$11,343	\$10,666	-\$677
Federal Vehicle and Fuels Standards and Certification	\$101,348	\$117,341	\$179,617	\$62,276
Subtotal, Clean Air and Climate	\$124,925	\$144,551	\$220,990	\$76,439
Indoor Air and Radiation				
Indoor Air: Radon Program	\$116	\$199	\$173	-\$26
Radiation: Protection	\$2,224	\$1,683	\$2,349	\$666
Radiation: Response Preparedness	\$2,928	\$3,596	\$4,686	\$1,090
Reduce Risks from Indoor Air	\$136	\$278	\$183	-\$95

Program Project	FY 2022 Final Actuals	FY 2023 Enacted Operating Plan	FY 2024 President's Budget	FY 2024 President's Budget v. FY 2023 Enacted Operating Plan
Subtotal, Indoor Air and Radiation	\$5,404	\$5,756	\$7,391	\$1,635
Enforcement				
Forensics Support	\$14,815	\$15,532	\$18,657	\$3,125
Homeland Security				
Homeland Security: Critical Infrastructure Protection	\$9,941	\$10,852	\$34,205	\$23,353
Homeland Security: Preparedness, Response, and Recovery	\$24,536	\$25,347	\$39,539	\$14,192
Homeland Security: Protection of EPA Personnel and Infrastructure	\$501	\$625	\$501	-\$124
Subtotal, Homeland Security	\$34,978	\$36,824	\$74,245	\$37,421
IT / Data Management / Security				
IT / Data Management	\$2,799	\$3,197	\$3,313	\$116
Operations and Administration				
Facilities Infrastructure and Operations	\$68,347	\$67,500	\$72,043	\$4,543
Pesticides Licensing				
Pesticides: Protect Human Health from Pesticide Risk	\$2,854	\$2,894	\$4,031	\$1,137
Pesticides: Protect the Environment from Pesticide Risk	\$2,487	\$2,334	\$2,339	\$5
Pesticides: Realize the Value of Pesticide Availability	\$941	\$925	\$1,002	\$77
Subtotal, Pesticides Licensing	\$6,282	\$6,153	\$7,372	\$1,219
Research: Air, Climate and Energy				
Research: Air, Climate and Energy	\$93,402	\$100,448	\$137,835	\$37,387
Research: Safe and Sustainable Water Resources				
Research: Safe and Sustainable Water Resources	\$113,427	\$116,141	\$123,555	\$7,414
Research: Sustainable Communities				
Research: Sustainable and Healthy Communities	\$133,808	\$137,857	\$146,642	\$8,785
Research: Chemical Safety for Sustainability				
Health and Environmental Risk Assessment	\$38,740	\$39,918	\$44,942	\$5,024
Research: Chemical Safety for Sustainability				
<i>Endocrine Disruptors</i>	\$16,325	\$16,353	\$17,530	\$1,177
<i>Computational Toxicology</i>	\$21,349	\$21,606	\$23,128	\$1,522
<i>Research: Chemical Safety for Sustainability (other activities)</i>	\$54,679	\$54,591	\$63,220	\$8,629

Program Project	FY 2022 Final Actuals	FY 2023 Enacted Operating Plan	FY 2024 President's Budget	FY 2024 President's Budget v. FY 2023 Enacted Operating Plan
Subtotal, Research: Chemical Safety for Sustainability	\$92,353	\$92,550	\$103,878	\$11,328
Subtotal, Research: Chemical Safety for Sustainability	\$131,092	\$132,468	\$148,820	\$16,352
Ensure Safe Water				
Drinking Water Programs	\$4,177	\$5,098	\$6,975	\$1,877
Clean and Safe Water Technical Assistance Grants				
Congressional Priorities	\$7,492	\$30,751	\$0	-\$30,751
TOTAL S&T	\$740,947	\$802,276	\$967,838	\$165,562

*For ease of comparison, Superfund transfer resources for the audit and research functions are shown in the Superfund account.

Clean Air

Clean Air Allowance Trading Programs

Program Area: Clean Air and Climate

Goal: Ensure Clean and Healthy Air for All Communities

Objective(s): Improve Air Quality and Reduce Localized Pollution and Health Impacts

(Dollars in Thousands)

	FY 2022 Final Actuals	FY 2023 Enacted Operating Plan	FY 2024 President's Budget	FY 2024 President's Budget v. FY 2023 Enacted Operating Plan
Environmental Programs & Management	\$15,423	\$16,554	\$30,535	\$13,981
<i>Science & Technology</i>	<i>\$8,360</i>	<i>\$7,117</i>	<i>\$19,983</i>	<i>\$12,866</i>
Total Budget Authority	\$23,783	\$23,671	\$50,518	\$26,847
Total Workyears	66.3	66.7	86.1	19.4

Program Project Description:

This Program is responsible for managing the Clean Air Status and Trends Network (CASTNET), an ambient monitoring network that has been continuously collecting data for more than 30 years. CASTNET serves as the Nation's primary source for assessing long-term trends in rural air quality and atmospheric pollutant inputs to ecosystems. CASTNET sites are uniquely situated in remote and high elevation areas within 42 states and seven tribal boundaries. The network provides valuable data to support the ozone National Ambient Air Quality Standards (NAAQS) in many areas not monitored by state, local, and tribal monitoring agencies. Additionally, CASTNET ozone data are used for exceptional event assessments of international transport, background concentrations, wildfire events, and stratospheric ozone intrusions often leading to ozone exceedances. The CASTNET program also supports 71 ambient ammonia monitoring sites and 30 wet deposition sites through its contribution to the National Atmospheric Deposition Program (NADP) to assess atmospheric concentrations of PM precursors (e.g., ammonia), nitrogen impacts on air and water quality (e.g., eutrophication, algal blooms), and ecosystem effects (e.g., reduction in biodiversity). The Agency utilizes CASTNET data to support the development, evaluation, and validation of air quality models used to assess results under potential future emission and climate scenarios. Used in conjunction with other ambient air quality networks, CASTNET's data products also are used to determine the effectiveness of national and regional emission control programs, validate satellite measurements, and provide near-real time data to support AirNow and Air Quality Index (AQI) reporting tools.

The CASTNET program provides spatial and temporal trends in ambient air quality and is the largest network in the world reporting atmospheric deposition used to assess ecological impacts in sensitive ecosystems (e.g., national parks, freshwater bodies, and subalpine regions). The sites also fill critical data gaps needed to understand precursor emission contributions leading to air quality issues affecting downwind population centers, such as agricultural activity, oil and gas production, wildfire smoke, and wood smoke in mountain valleys. Rural CASTNET sites are intentionally located away from stationary emission sources but are often located in or near economically disadvantaged communities, tribal communities, or communities of color. Maintaining the CASTNET monitoring network continues to be critical for assessing the environmental benefits

realized from regional emission reduction programs (thereby reducing secondary pollutant formation of ozone and fine particles), and simultaneously evaluating how climate stressors may impact future improvements to air quality and ecosystem recovery. During the pandemic, EPA addressed the disparate impacts of COVID-19 on areas with poor air quality by using CASTNET data to track and assess how pandemic-related policies and changes in economic activity affected air quality.

EPA works closely with tribal governments to build tribal air monitoring capacity through partnerships with the CASTNET program. Since 2002, CASTNET has added seven sites on tribal lands, including two new sites in the northwest U.S. By expanding tribal partnerships, CASTNET can fill important spatial gaps in air quality and atmospheric deposition monitoring while providing tribes with the equipment and technical training to collect and report local air quality data. Tribes benefit from dedicated monitoring sites that build technical skills, provide near-real time air quality data to the community, and provide environmental data that help tribes assess the impacts of air pollution on cultural or natural resources on tribal lands. Tribal partners utilize the CASTNET data to review permit applications, assess impacts from upwind emissions sources, and provide hands-on educational training. CASTNET hosts quarterly calls with EPA Regions and tribal partners which provides a forum for sharing technical information, establishing training modules, and engaging directly with the user community.

To support modernization efforts, CASTNET will use the existing network infrastructure to fill in gaps in continuous measurements necessary to evaluate changes in atmospheric chemistry and global climate impacts on air quality and deposition. The Program is well-situated to measure background or regional levels of air toxics (e.g., ethylene oxide) and persistent chemicals of concern (e.g., PFAS compounds). Measuring speciated reactive nitrogen will provide valuable data that states can use to determine which precursors are driving PM formation and make more informed decisions on emission control strategies. Furthermore, continuing to expand capacity while modernizing the CASTNET infrastructure ensures data can be made available in near-real time to address short-term changes in air quality resulting from meteorological conditions, such as temperature inversions, or natural disasters, such as wildfires.

This program also is responsible for managing EPA's Long-Term Monitoring (LTM) program, which was created to assess the health of lakes and streams in response to changes in deposition of atmospheric pollutants. It also ensures that the Clean Air Act continues to be effective in reducing the impact of atmospheric pollutants (e.g., strong acid anions) on surface waters in New England, the Adirondack Mountains, the Northern Appalachian Plateau (including the Catskill mountains), and the Blue Ridge region. This program is operated cooperatively with partners in state agencies, academic institutions, and other federal agencies. The LTM surface water chemistry monitoring program provides field measurements for understanding biogeochemical changes in sulfur, nitrogen, acid neutralizing capacity, aluminum, and carbon in streams and lakes in relation to reductions in pollutant emissions and a changing climate. The LTM program is one of the longest running programs at EPA, providing a longitudinal dataset based on sampling and measurements since 1983.

This program also supports the Clean Air Allowance Trading Programs, which are nationwide and multi-state programs that address air pollutants that are transported across state, regional, and

international boundaries. Programs designed to control SO₂ and NO_x include Title IV (the Acid Rain Program) of the Clean Air Act, the Cross-State Air Pollution Rule (CSAPR), the CSAPR Update (which was revised in 2021 in response to a court remand), and the Revised CSAPR Update. The infrastructure for the Clean Air Allowance Trading Programs also supports implementation of other state and federal programs to control SO₂, hazardous air pollutants, and greenhouse gases.

Both the CSAPR and the CSAPR Update Rule require 27 states in the eastern U.S. to limit their emissions of SO₂ and/or NO_x in order to reduce or eliminate the states' contributions to fine particulate matter and/or ground-level ozone pollution in other states. These programs set emissions limitations that are defined in terms of maximum statewide "budgets" for emissions of annual SO₂, annual NO_x, and/or ozone-season NO_x from each state's large electric generating units. EPA is supporting state efforts with respect to best available retrofit technology, reasonable progress, and interstate visibility transport, as those obligations relate to SO₂ emissions from electricity generating units.¹ The air quality and other environmental information gathered through this program also support other Clean Air Allowance Trading Program-related rulemakings, such as EPA's proposed Good Neighbor Plan to reduce emissions contributing to interstate air pollution under the 2015 ozone NAAQS and rulemakings associated with Regional Haze.

FY 2024 Activities and Performance Plan:

Work in this program directly supports Goal 4/Objective 4.1, Improve Air Quality and Reduce Localized Pollution and Health Impacts in the *FY 2022 - 2026 EPA Strategic Plan*.

In FY 2024, EPA is requesting approximately \$13.2 million, including payroll, to modernize the existing CASTNET network, focusing on greater system reliability, enhanced network automation, and "big data" improvements for enhanced assessments, maintain and provide additional monitoring sites and deployable monitors on tribal lands, and expand site functionality (i.e., measuring additional air pollutants). In FY 2024, EPA will:

- Continue to support 64 CASTNET sites, including seven tribal sites, 30 NADP National Trends Network (NTN), 71 NADP Ammonia Monitoring Network (AMoN), and LTM sites that provide long-term atmospheric concentrations, deposition, and surface water quality data. Data are used to analyze and assess air quality, trends in sulfur and nitrogen deposition, critical loads, and other indicators of ecosystem health.
- Provide support for independent audits and required performance evaluations to assure high-quality data to support the NAAQS and environmental assessments.
- Continue progress toward increasing monitoring capacity by working to identify new tribal partners and other underserved communities that would benefit from joining a national air monitoring program.

¹ Clean Air Act § 110 and § 169A; refer to 40 CFR 52.2312.

- Invest in technology and small businesses by replacing aging equipment, repairing monitoring shelters more than 30 years old that have deteriorated due to extreme weather and deploying new equipment and monitoring sites in rural, often low-income/minority areas. The CASTNET contractor allocates 55 percent of their subcontract dollars to small businesses responsible for performing calibrations, managing site operators, and data analyses.
- Upgrade aging CASTNET equipment. To improve overall data quality EPA will replace continuous ozone analyzers, and procure new PM and gas analyzers (e.g., CO, VOCs, speciated nitrogen) that will support NAAQS assessments, emission control strategies, regulatory actions, and climate impacts on air quality and ecosystems in the future. Analyzers will be integrated into the existing automated calibration systems to improve network resiliency.
- Utilize existing infrastructure to expand network capacity by adding measurement systems for background and regional concentrations of air toxics and emerging pollutants of concern. Data will complement urban measurements and provide valuable information on atmospheric pathways and chemical transformations that will impact health risks.
- Continue to modernize the data reporting tools and visualizations to improve user experiences and data access, particularly during emergencies (e.g., COVID-19 pandemic). Strengthening front-end and back-end data management platforms will improve system reliability and allows state and local agencies to quickly make critical decisions. Providing real-time air quality data during such events is valuable for informing vulnerable populations about health risks.
- Assure the continuation of ongoing SO₂ and NO_x emission reductions from power plants in the eastern half of the U.S. by implementing CSAPR and the CSAPR Update, and across the contiguous U.S. by implementing the Acid Rain Program.²
- Ensure accurate and consistent results for the Clean Air Allowance Trading Programs. Continue work on performance specifications and investigating monitoring alternatives and methods to improve the efficiency of monitor certification and emissions data reporting.
- Work with states to implement emission reduction programs to comply with CAA Section 110(a)(2)(D)(i)(I) requirements, including conducting environmental justice analyses to consider the distributional impacts of emissions on overburdened and vulnerable communities.³

Performance Measure Targets:

(PM NO_x) Tons of ozone season NO_x emissions from electric power generation sources.

	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	Units
Target						355,000	344,000	332,000	Tons
Actual	464,999	443,764	389,170	341,082	359,124	326,722			

² Clean Air Act §§ 110(a)(2)(D) and 401.

³ For more information on program performance, please see: <https://www.epa.gov/airmarkets/progress>.

FY 2024 Change from FY 2023 Enacted Budget (Dollars in Thousands):

- (-\$383.0) This change to fixed and other costs is a decrease due to the recalculation of base workforce costs for existing FTE due to annual payroll increases, adjustments to provide essential workforce support, and changes to benefits costs.
- (+\$13,249.0 / +1.7 FTE) This program change is an increase to modernize the existing CASTNET network, maintain and provide additional monitoring sites and deployable monitors, including on tribal lands, and expanding site functionality (i.e., measuring additional air pollutants). This investment includes \$302.0 thousand in payroll.

Statutory Authority:

Clean Air Act.

Climate Protection

Program Area: Clean Air and Climate

Goal: Tackle the Climate Crisis

Objective(s): Reduce Emissions that Cause Climate Change

(Dollars in Thousands)

	FY 2022 Final Actuals	FY 2023 Enacted Operating Plan	FY 2024 President's Budget	FY 2024 President's Budget v. FY 2023 Enacted Operating Plan
Environmental Programs & Management	\$100,267	\$101,000	\$170,512	\$69,512
<i>Science & Technology</i>	<i>\$6,723</i>	<i>\$8,750</i>	<i>\$10,724</i>	<i>\$1,974</i>
Total Budget Authority	\$106,990	\$109,750	\$181,236	\$71,486
Total Workyears	209.3	216.1	256.7	40.6

Program Project Description:

The Climate Protection Program supports implementation and compliance with greenhouse gas (GHG) emission standards for light-duty and heavy-duty vehicles developed under EPA's Federal Vehicle and Fuels Standards and Certification Program. Resources under this Program also support compliance activities for implementing the National Highway Traffic Safety Administration's (NHTSA) Corporate Average Fuel Economy (CAFE) standards. Under authorities contained in the Clean Air Act and the Energy Policy Act, EPA is responsible for issuing certificates and ensuring compliance with both the GHG and CAFE standards.

FY 2024 Activities and Performance Plan:

Work in this program directly supports Goal 1/Objective 1.1, Reduce Emissions that Cause Climate Change in the *FY 2022 - 2026 EPA Strategic Plan*.

Resources will support the following activities:

Certification and Compliance

Implementation of the GHG emission standards for light-duty and heavy-duty vehicles and engines has significantly increased EPA's certification and compliance responsibilities. These responsibilities play a critical role in ensuring that the programs achieve their climate goals. Over time, in an effort to provide greater compliance flexibility for manufacturers, EPA has introduced numerous innovative features into the vehicle certification process. These features include new and more comprehensive trading programs, credits for off-cycle emission reductions, and new federal test procedures. In FY 2024, EPA will continue implementing Light-Duty and Heavy-Duty GHG programs based on the changes in the "near-term" Light-Duty final rule and the proposed changes in the Heavy-Duty 2027+ rulemaking. This implementation requires significant expansions of EPA's information technology systems, which provide an efficient means for manufacturers to apply for and receive certificates of conformity, and for EPA to audit and oversee manufacturer compliance.

Vehicle and Engine Testing Services

EPA's National Vehicle & Fuel Emissions Laboratory (NVFEL) has invested significant resources to maintain its critical vehicle and engine testing capabilities and to upgrade them as needed to implement new standards for fuel, vehicle, and engine emissions. These investments have included updates to its four-wheel drive dynamometers and analytical systems needed to perform regulation development and certification testing of light-duty, medium-duty, and heavy-duty vehicles, including battery electric and hybrid electric technologies. This modernized test environment has led to new developments, such as test methods for accurately measuring the efficiency and range of electrified vehicles and new processes for gathering and analyzing in-use fuel efficiency data from vehicles tested on the road.

In FY 2024, NVFEL will direct resources toward updating its electric vehicle charging infrastructure in the laboratory to support anticipated future test requirements for light-duty and heavy-duty vehicles and will prepare for testing of hydrogen fuel cell technologies. NVFEL's ongoing facility modernization has been essential to the implementation of testing requirements for EPA's existing GHG regulations and has expanded production of scientific data on new and emerging vehicle and engine technologies in support of EPA's current rulemaking activities. Continued equipment modernization is critical to NVFEL in keeping pace with technology advancements in the transportation sector, and in maintaining the lab's role as a trusted testing standard for regulated industry and as a credible deterrent against non-compliance.

In addition to investing in emerging needs, NVFEL will continue to maintain, repair, and replace aging laboratory equipment needed to sustain its core compliance testing activities. In FY 2024, NVFEL plans to extensively replace aging or obsolete test equipment supporting its vehicle and engine compliance programs. This represents a continuation of annual and ongoing capital equipment maintenance associated with the expansion of lab testing programs needed to implement light-duty and heavy-duty criteria pollutant and GHG regulations, which have increased NVFEL's operation and maintenance costs by an estimated \$2.1 million per year.

Performance Measure Targets:

EPA's FY 2024 Annual Performance Plan does not include annual performance goals specific to this program.

FY 2024 Change from FY 2023 Enacted Budget (Dollars in Thousands):

- (+\$43.0) This change to fixed and other costs is an increase due to the recalculation of base workforce costs for existing FTE due to annual payroll increases, adjustments to provide essential workforce support, and changes to benefits costs.
- (+\$1,931.0 / +2.3 FTE) This program change is an increase in support of the National Vehicle and Fuel Emissions Laboratory compliance/certification work and mobile source vehicle emissions analysis. Additional resources at the lab support restoring capacity to test and certify engines, fuels, and vehicles to ensure compliance with regulatory standards, and to generate emissions data to support regulatory development work essential to tackling the climate change crisis. This investment includes \$411.0 thousand in payroll.

Statutory Authority:

Clean Air Act; Pollution Prevention Act (PPA), §§ 6602-6605; National Environmental Policy Act (NEPA), § 102; Clean Water Act, § 104; Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act (RCRA), § 8001; Energy Policy Act of 2005, § 756.

Federal Support for Air Quality Management

Program Area: Clean Air and Climate

Goal: Ensure Clean and Healthy Air for All Communities

Objective(s): Improve Air Quality and Reduce Localized Pollution and Health Impacts

(Dollars in Thousands)

	FY 2022 Final Actuals	FY 2023 Enacted Operating Plan	FY 2024 President's Budget	FY 2024 President's Budget v. FY 2023 Enacted Operating Plan
Environmental Programs & Management	\$148,894	\$147,704	\$356,016	\$208,312
<i>Science & Technology</i>	<i>\$8,494</i>	<i>\$11,343</i>	<i>\$10,666</i>	<i>-\$677</i>
Total Budget Authority	\$157,387	\$159,047	\$366,682	\$207,635
Total Workyears	827.8	879.3	1,079.7	200.4

Program Project Description:

Federal support for the criteria pollutant and air toxics programs includes a variety of tools to characterize ambient air quality and the level of risk to the public from air pollutants and to measure national progress toward improving air quality and reducing associated risks. The Federal Support for Air Quality Management Program supports development of State Implementation Plans (SIPs) through modeling and other tools and assists states in implementing, attaining, maintaining, and enforcing the National Ambient Air Quality Standards (NAAQS) for criteria pollutants. The Program also supports development and provision of information, training, and tools to assist state, tribal, and local agencies, as well as communities, to reduce air toxics emissions and risks specific to their local areas. In addition, the Program supports activities related to the Clean Air Act (CAA) stationary source residual risk and technology review program. EPA is required to assess the level of risk remaining after promulgation of National Emission Standards for Hazardous Air Pollutants (NESHAP) that are based on Maximum Available Control Technology (MACT) within eight years of that promulgation. In addition, the Agency is required to review all NESHAP at least every eight years to determine if revisions are needed to reflect developments in practices, processes, and control technologies.

FY 2024 Activities and Performance Plan:

Work in this program directly supports Goal 4/Objective 4.1, Improve Air Quality and Reduce Localized Pollution and Health Impacts in the *FY 2022 - 2026 EPA Strategic Plan*.

During FY 2024, as part of implementing key activities in support of attainment of the NAAQS, EPA will provide states, tribes, and local air agencies with scientifically and technically sound assistance in developing SIPs/ Tribal Implementation Plans (TIPs) that meet requirements to attain and maintain the NAAQS. This assistance includes providing models, modeling inputs and tools, technical data and guidance, and identifying emission control options. EPA facilitates national consistency in how air quality modeling is conducted as part of regulatory decision-making, including federal and state permitting programs, SIP/TIP-related actions, as well as how conformity determinations are made across the U.S. The Agency will work with states, tribes, and

local air agencies to ensure that particulate matter (PM) hot-spot analyses are conducted in a manner consistent with the transportation conformity regulation and guidance.

One of EPA's priorities is to fulfill its statutory and court-ordered obligations, and EPA will continue to emphasize incorporating environmental justice considerations in the decision-making processes involved in meeting these obligations. In FY 2024, EPA will continue to conduct the periodically required "technology reviews" of NESHAP and conduct required risk assessments for MACT-based NESHAP. EPA will enhance risk assessment capabilities to better identify and determine impacts on communities. The Agency will share air toxics data faster and more regularly to the public, allowing for increased transparency and the ability to see trends and risks over time. In 2024, EPA will continue reporting the most current air toxics data each year in the annual Air Trends Report and in an online interactive tool instead of the previous three to four-year cycle for reporting air toxics data and provide that data at increased spatial resolution.

EPA will continue to provide information and assistance to states, tribes, and communities through documents, websites, webinars, and training sessions on tools to help them on environmental justice assessments that can inform risk reduction strategies for air toxics. EPA will continue to communicate and collaborate effectively with communities with environmental justice concerns to address air toxics issues. EPA will enhance its multi-pollutant air quality management support to state and local areas, factoring environmental justice into prioritization efforts, including providing tools to enable state, tribal, and local governments planning and strategy development. EPA will continue to look at multiple pollutants in an industrial sector and identify ways to encourage adoption of policies which optimize co-benefits of pollution control, including for greenhouse gases. The focus of these efforts is to address an individual sector's emissions comprehensively and to prioritize regulatory efforts to address the sources and pollutants of greatest concern to overburdened communities. In developing sector and multi-pollutant approaches, EPA will continue to improve its NEXUS tool and other multipollutant solutions that address the differing and cumulative nature of the multiple pollutants and associated industrial sectors.

In FY 2024, EPA will continue to work with internal and external stakeholders to improve ambient air quality monitoring networks and measurement techniques to fill data gaps and to provide better input to estimation of population exposure to criteria and toxic air pollutants. To ensure data quality, EPA will continue to implement and manage independent quality assurance programs for national monitoring networks as well as for federal and commercial laboratories that produce ambient air monitoring data.

In FY 2024, EPA will continue to work with partners to improve emissions factors and inventories, including the National Emissions Inventory (NEI). This effort includes gathering improved activity data from emissions monitoring and using geographic information systems and satellite remote sensing systems, where possible, for key point, area, mobile, and fugitive sources, and global emission events.

In FY 2024, EPA will continue to operate and maintain the Air Quality System (AQS), which houses the Nation's regulatory ambient air quality data. EPA will support the AQS Data Mart, which provides that same ambient air quality data to the scientific community and to the general public. The Agency's national real-time ambient air quality data system, AirNow, will maintain

baseline operations. The public increasingly relies on AirNow for ambient air quality information during wildfires. In FY 2024, EPA will continue improving the Fire and Smoke map by engaging tribal, state, and local agencies for input.

The Agency is developing a process that will allow all ambient air quality data to be submitted to a single information system. This single system will greatly improve the processing and availability of ambient air quality data to Agency regulatory partners and to the public. FY 2024 funds are requested to develop the single system that will eventually modernize AirNow, AQS, and the AQS Data Mart.

EPA will continue to operate and maintain the Emissions Inventory System (EIS), which quality assures and stores current and historical emissions inventory data and supports the development of the NEI. EPA, states, and others use the NEI to aid in state and local air agency SIP development, serve as a vital input to air quality modeling, help analyze public health risks from air toxics, develop strategies to manage those risks, and support multi-pollutant analysis for air emissions. The Agency will enhance EIS to support the revised Air Emissions Reporting Requirements (AERR) rule and other user-focused needs.

EPA is streamlining emissions data reporting for multiple Agency programs through the Combined Air Emissions Reporting System (CAERS). This system is a central hub that takes a single submission of data in a single format and sends it to the appropriate EPA program system. When fully developed, CAERS is expected to reduce the cost to industry by only reporting emissions data for multiple Agency programs to one system and to the government by better managing emissions data and making that data available in a timely fashion.

Performance Measure Targets:

Work under this program supports performance results in the Federal Support for Air Quality Management program under the EPM appropriation.

FY 2024 Change from FY 2023 Enacted Budget (Dollars in Thousands):

- (+\$544.0) This change to fixed and other costs is an increase due to the recalculation of base workforce costs for existing FTE due to annual payroll increases, adjustments to provide essential workforce support, and changes to benefits costs.
- (-\$1,221.0 / +6.0 FTE) This net program change reflects a shift to fund additional FTE for the development of science, technology, and methodologies to better implement the Clean Air Act, including: enhancing risk assessment capabilities to better identify and determine impacts on communities; communicating and collaborating with environmental justice communities to address air toxics concerns; and improving ambient air monitoring networks and measurement techniques to fill data gaps and better estimate the population's exposure to criteria and toxic air pollutants. This net investment includes \$1.221 million in payroll.

Statutory Authority:

Clean Air Act.

Federal Vehicle and Fuels Standards and Certification

Program Area: Clean Air and Climate

Goal: Tackle the Climate Crisis

Objective(s): Reduce Emissions that Cause Climate Change

(Dollars in Thousands)

	FY 2022 Final Actuals	FY 2023 Enacted Operating Plan	FY 2024 President's Budget	FY 2024 President's Budget v. FY 2023 Enacted Operating Plan
<i>Science & Technology</i>	<i>\$101,348</i>	<i>\$117,341</i>	<i>\$179,617</i>	<i>\$62,276</i>
Total Budget Authority	\$101,348	\$117,341	\$179,617	\$62,276
Total Workyears	309.3	323.5	370.3	46.8

Program Project Description:

Under the Federal Vehicle and Fuels Standards and Certification Program, EPA develops, implements, and ensures compliance with national emission standards to reduce mobile source related air pollution from: light-duty cars and trucks; heavy-duty trucks and buses; nonroad engines and equipment; and from the fuels that power these engines. The Program also evaluates new emission control technology and provides state, tribal, and local air quality managers and transportation planners with guidance, tools, and other information to develop additional strategies and place-based transportation programs to reduce mobile source pollution.

As part of ensuring compliance with national emission standards, the Program tests vehicles, engines, and fuels, and establishes test procedures for federal emissions and fuel economy standards. The Program operates test cells that simultaneously measure criteria pollutants and greenhouse gas (GHG) emissions, reviews certification applications for light-duty vehicles and heavy-duty engines to approve applications for criteria pollutant and GHG emission standards and examines for potential violations.

National Vehicle and Fuel Emissions Laboratory (NVFEL)

The NVFEL ensures air quality benefits and fair competition in the marketplace by conducting testing operations on motor vehicles, heavy-duty engines, nonroad engines, and fuels to certify that all vehicles, engines, and fuels that enter the U.S. market comply with all federal clean air, GHG, and fuel economy standards. The NVFEL conducts vehicle and engine emission tests as part of pre-production tests, certification audits, in-use assessments, and recall programs to ensure compliance with mobile source programs. The NVFEL also produces critical test data on new and emerging vehicle and engine technologies to support the development of future greenhouse gas and criteria pollutant regulations. Through cooperative partnerships and committee involvement, the lab leads the development and implementation of test methods and procedures for vehicles, engines, and fuels to ensure consistent data quality among manufacturers' labs, measure fuel efficiency, and verify compliance of electrified and conventional vehicles with EPA standards.

Renewable Fuel Standard (RFS)

The RFS Program was created under the Energy Policy Act of 2005 (EPAct), which amended the Clean Air Act, and was expanded under the Energy Independence and Security Act of 2007 (EISA). The RFS Program requires a certain volume of renewable fuel to replace or reduce the quantity of petroleum-based transportation fuel, heating oil, or jet fuel.

Supporting Tribal, State and Local Governments

EPA works with tribal, state, and local governments to ensure the technical integrity of the mobile source control emission benefits, including in State Implementation Plans (SIPs) and transportation conformity determinations. EPA develops and provides information and tools to assist tribal, state, and local agencies, as well as communities, to reduce criteria pollutant and air toxics emissions and risks specific to their local areas. Reductions in emissions of mobile source air pollution, such as components of diesel exhaust, are achieved through: guidance and technical assistance for state and local Clean Air Act mobile source programs in nonattainment and maintenance areas for the National Ambient Air Quality Standards (NAAQS); establishing national emissions standards for vehicles, equipment, and fuels, research of public health impacts and mitigation options; methods for quantifying multi-pollutant emission reductions for place-based strategies; and partnership approaches working with tribal, state, and local governments, as well as a variety of non-governmental stakeholder groups.

Prioritizing Environmental Justice

In response to the Administration's priorities and goals, EPA's mobile source programs will further integrate environmental justice (EJ) and equity considerations. This includes: 1) outreach and inclusion throughout the regulatory development process; 2) analysis of current conditions to understand economic inequities potentially related to EPA's regulatory policies – as well as disparities in exposure to mobile source air pollution experienced by people of color, low-income populations, and tribal communities; 3) analysis of the equity and air quality improvements from EPA's regulatory actions and voluntary programs; 4) technical assistance to state, local, and tribal governments to reduce regional and localized criteria pollutant and other emissions through regulatory and non-regulatory strategies, including nearby communities with environmental justice concerns, and within the context of meeting Clean Air Act SIP, transportation conformity, and other air quality planning requirements; and 5) application of non-regulatory mitigation measures through partnership programs including the Diesel Emissions Reduction Act (DERA) Program and EPA's Ports Initiative, to further target improvements in air quality for those disproportionately exposed to air pollution from mobile sources.

FY 2024 Activities and Performance Plan:

Work in this program directly supports Goal 1/Objective 1.1, Reduce Emissions that Cause Climate Change in the *FY 2022 - 2026 EPA Strategic Plan*.

To support both climate change and air quality work activities relating to EPA's mobile sources program, EPA is requesting additional resources in FY 2024. This includes funding for the development of analytical methods, regulations, and analyses by controlling greenhouse gas, criteria pollutant, and air toxics emissions from light-duty, medium-duty, and heavy-duty vehicles.

Federal Vehicle and Fuels Standards and Certification Program

In FY 2024, the Federal Vehicle and Fuels Standards and Certification Program will continue to focus its efforts on certification responsibilities. The Agency will continue to perform its compliance oversight functions on priority matters, conducting compliance oversight tests where evidence suggests noncompliance. EPA will continue to conduct pre-certification confirmatory testing activities for emissions and fuel economy for passenger cars and will increase on-road measurements of in-use vehicle emissions. EPA anticipates reviewing and approving about 4,900 vehicle and engine emissions certification requests from vehicle and engine manufacturers, including light-duty vehicles, heavy-duty diesel engines, nonroad engines, marine engines, locomotives, and others. EPA's certification services have sustained high demand, due to the number of industries we regulate as well as increasing complexities with each subsequent change in stringency and rulemaking action. Accordingly, NVFEL will increase compliance testing in each of these areas in FY 2024.

EPA utilizes in-use emissions data provided by light-duty vehicle manufacturers to measure compliance and determine if any follow-up evaluation or testing is necessary. Since calendar year (CY) 2000, light-duty vehicle manufacturers have been required to test a number of newer and older in-use vehicles and provide the data to EPA. The Agency receives over 6,000 emissions tests results from more than 2,000 vehicles annually. EPA reviews the data and determines if there are any specific vehicles, models, or manufacturers that are failing in-use emissions standards. The Agency will use this information submitted by light-duty manufacturers, together with emissions data collected at NVFEL, to determine if there are vehicle models which should be recalled and repaired to address excess in-use emissions and that should be identified for testing for the upcoming model year prior to granting the manufacturer a certificate of conformity, which allows the manufacturer to sell vehicles in the U.S.

Emission Standards for New Motor Vehicles

In FY 2024, EPA will take action to reduce air pollution and GHG emissions by focusing on the transportation sector's largest contributors to criteria pollutant and GHG emissions: light-duty vehicles (LDVs) and heavy-duty vehicles (HDVs). Work also supports EPA's long-term performance goal to promulgate final rules that will reduce GHG emissions from light duty, medium-duty, and heavy-duty vehicles; electric utility generating units; and the oil and gas industry.

In FY 2022, EPA completed a revision of the light-duty vehicle GHG standards established in April 2020 (the Safer Affordable Fuel-Efficient Vehicles Rule), setting revised "near-term" standards through model year (MY) 2026. In March 2022, EPA reinstated California's waiver of preemption under the Clean Air Act (CAA) for its own GHG emission standards and zero emission vehicle (ZEV) sales mandate. As a result of this action, other states may choose to adopt and enforce California's GHG emission standards in lieu of the Federal standards, consistent with section 177 of the Clean Air Act.

In FY 2024, EPA will promulgate a final rulemaking for new multi-pollutant emissions standards, including for greenhouse gas emissions, for light- and medium-duty vehicles beginning with MY 2027 and extending through and including at least MY 2030. These standards will account for technologies that allow zero and near-zero emissions. Many automakers have recently announced ambitious plans for electrifying their new LDV fleets in the 2030 to 2040 timeframe. This

rulemaking also will be a key measure in contributing to the President's commitment under the Paris Agreement to reduce U.S. GHG emissions by 50-52 percent from 2005 levels by 2030.

In December 2022, EPA finalized a rulemaking to reduce nitrogen oxides (NOx) emissions from MY 2027 and later heavy-duty engines and vehicles. Pollution from trucks has been a long-standing obstacle to advancing environmental justice, as many low-income communities and communities of color live near highways or in heavily polluted areas with frequent truck congestion and idling. Setting clear and stringent standards for truck pollution is critical to delivering on the President's commitment to delivering tangible benefits to historically underserved and overburdened communities.

In FY 2024, EPA will promulgate a final rulemaking under the CAA to establish new GHG emissions standards for heavy-duty engines and vehicles beginning with MY 2027. This rule will reduce GHG and other emissions from highway HDVs, the second-largest source of transportation GHG emissions. This action will build on the heavy-duty MY 2027 rulemaking and accelerate the transition to zero-emission vehicles. A key focus for the GHG elements of this effort will be the shift from HDVs powered by internal combustion engines to those powered by zero-emission technologies, such as battery electric and fuel-cell technologies.

EPA will invest significant resources to address a myriad of new technical challenges to support these two sets of long-term rulemakings, which will include added LDV and HDV testing and modeling capabilities at NVFEL. Key to this technical work is to understand the cost, feasibility, and infrastructure impacts of electrifying the broad range of products in the LDV and HDV sectors. This will include vehicle demonstration projects focused on emerging technologies, that are still in the pre-production stage with manufacturers, but are expected to be strategically important in achieving future standards.

Fuel Economy Labeling Requirements

In FY 2024, EPA also will oversee compliance with vehicle fuel economy labeling requirements. In past years, EPA conducted in-use audits of manufacturer "coast-down" data, revealing issues in manufacturer data submitted to EPA and, as a result, found inaccurate fuel economy labels on more than a million vehicles from several manufacturers. Due to the increasing consumer demand and subsequent increased electric vehicle offerings, EPA would like to begin a coast-down program for electric vehicles in FY 2024.

Tier 3 Light-Duty Vehicle Standards

In FY 2024, EPA will continue implementing the Tier 3 standards for light-duty vehicles and certifying manufacturers' fleets for vehicle MY 2023 and MY 2024. EPA is responsible for establishing the test procedures needed to measure tailpipe emissions and for verifying manufacturers' vehicle fuel economy data. As a result, the Agency will continue to maintain its critical laboratory equipment and testing resources to ensure that new cars and trucks comply with the Tier 3 emissions standards.

Marine and Aircraft Emission Reduction Measures

EPA will continue working with the International Maritime Organization (IMO) and the International Civil Aviation Organization (ICAO) on programs to control pollutant emissions from marine and aircraft engines, respectively. EPA is supporting the State Department and Coast Guard

on technical issues related to establishing measures to achieve GHG targets established at IMO. At ICAO, EPA will actively participate in the development of new CO₂ standards for decision in February 2025 as well as technical work that could lead to future, more stringent NO_x and PM emission standards.

In addition to the international efforts for aviation, EPA is continuing its work to address lead in aviation gasoline. In FY 2024 the EPA will finalize its evaluation, under the Clean Air Act, of whether emissions of lead from piston-engine aircraft cause or contribute to air pollution that endangers public health or welfare. In addition, in coordination with the Federal Aviation Administration and working with airports, local air agencies, and communities, EPA is evaluating potential exposures to lead from the use of leaded aviation gasoline in piston-engine aircraft as well as potential mitigation measures.

Locomotive and Land-based Nonroad Engines, Equipment, and Vehicles

EPA will perform technical assessments to support regulatory actions to reduce air pollution from locomotives as well as land-based nonroad engines, equipment, and vehicles. EPA last revised emission standards for these important sectors more than ten years ago (e.g., 2008 for locomotives, 2004 for land-based nonroad diesel engines), yet these mobile source sectors continue to contribute significantly to air pollution at the global, regional, and local level. In addition, technologies which can significantly reduce air pollution from these sources have evolved significantly in the past 10–15 years. EPA will perform assessments and other activities including technology evaluation, cost and economic assessments, emissions data collection, and modeling efforts.

Emissions Modeling

The Motor Vehicle Emission Simulator (MOVES) is the Agency's emission modeling system that estimates emissions for on-road and nonroad mobile sources at the national, county, and project levels for criteria air pollutants, GHGs, and air toxics. In FY 2024, the official version of EPA's model will be used to estimate impacts of the Agency's emission control programs and will be used by states and metropolitan planning organizations (MPOs) in their work to meet the NAAQS, including the development of SIPs and transportation conformity analyses. The Agency also will support users on any new model releases that incorporate the best available data and science and account for the latest emission standards.

National Vehicle and Fuel Emissions Laboratory Facility Infrastructure

NVFEL provides all laboratory testing and support functions necessary for the Agency to certify that all vehicles, engines, and fuels sold in the United States are in compliance with U.S. emission standards, representing 4,900 certificates issued to vehicle and engine manufacturers on an annual basis.

The Agency recently awarded a new Energy Savings Performance Contract (ESPC) to pursue an infrastructure upgrade project for the NVFEL facility with capital equipment costs in excess of \$59 million. The ESPC replaces the mechanical, electrical, control and building management systems for the HVAC (heating, ventilation, and air conditioning) equipment that is at or beyond the end of its useful life. ESPCs, private/public partnership contract vehicles coordinated through the Department of Energy, use facilities' energy and operational savings to offset many of the contract costs.

In FY 2024, EPA is requesting an additional \$10 million to fund the ESPC. Resources to fund the ESPC are critical to support the ability of NVFEL to carry-out its mission-critical work of certifying vehicle compliance. Ensuring industry's compliance is a priority for EPA and an essential safeguard of fair market competition for manufacturers of vehicles and engines introduced into commerce in the United States. The energy savings to be realized when the ESPC is fully implemented in FY2025 is estimated to be 34,473 MBtu annually (39% energy reduction), water conservation of 1.7 million gallons annually (16% reduction), and annual greenhouse gas reduction of 3,158 metric tons of carbon dioxide equivalent.

Renewable Fuel Standard

EPA activity in the fuel sector will be centered on the implementation of the RFS program. Congress established renewable fuel volume targets through CY 2022, leaving it to the Agency to establish the volumes for CY 2023 and beyond. During FY 2023, EPA will be issuing a final rule to establish such volumes for CY 2023 and potentially later years (in the "RFS Set Rule"). During FY 2024, EPA will need to continue the work to develop proposed rulemaking(s) necessary to establish renewable fuel volume targets for the calendar years that did not have renewable fuel volumes established in the first "RFS Set rule."

In FY 2024, EPA will maintain oversight of the RFS program and continue to evaluate compliance with RFS provisions through EPA's Moderated Transaction System (EMTS), the program's dedicated information system, which is used to track the creation, trades, and use of billions of RINs for compliance. The tracking system handles 4,000 to 6,000 submissions per day, typically averaging more than 20,000 transactions per day, and the generation of more than 1.4 billion RINs per month. RINs are generated with the production of qualifying renewable fuel and are used to achieve national RFS programmatic goals of reducing or replacing the quantity of petroleum-based transportation fuel, heating oil, or jet fuel produced.

In addition, EPA will continue efforts associated with the ongoing general implementation of the program. These include: 1) updating and revising the regulations to improve program implementation and effectiveness and enable new sources of renewable fuel volumes; 2) registering new renewable fuel facilities to enable them to generate renewable fuel credits known as Renewable Identification Numbers (RINs); 3) building critical new capability in EMTS; 4) evaluating and implementing, if appropriate, enhancements to improve program operations, oversight and enforceability; 5) evaluating and implementing IT systems modifications and enhancements that provide the greatest returns on investment through continuous improvement; 6) ensuring the integrity of the RFS program through enforcement actions against those using the program for fraudulent gain; and 7) supporting the Department of Justice in defending the Agency's implementation of the RFS program in numerous challenges in court.

In FY 2024, EPA will continue its work related to assessing lifecycle GHG emissions associated with renewable fuels, as required to implement GHG threshold requirements under the Clean Air Act. Producers of new and advanced biofuels regularly seek to qualify their fuels under RFS, and EPA will continue to evaluate such feedstocks and fuels to determine eligibility for the program. The Agency also will look at ways to update the science and data analysis that supports EPA's evaluation methodology.

EPA also will continue to implement gasoline and diesel fuel quality standards and obligations under the Clean Air Act. This includes many of the same compliance and enforcement oversight activities mentioned above for the RFS. In late 2020, EPA finalized a fuel regulation streamlining rule that included updated registration, recordkeeping, and reporting requirements. EPA will continue efforts in FY 2024 to implement these requirements through continuous improvement of IT registration and reporting systems to deliver the full impact and benefit of the investment made in the streamlined regulations. These include automation and reduced registration, administration, and reporting burdens for both the regulated community and EPA. Finally, in FY 2024 EPA will continue its ongoing research into new opportunities to improve and/or protect fuel quality in ways that can reduce air pollution and improve public health and welfare.

In FY 2024, EPA will continue to work with stakeholders to implement a new electronic reporting portal for its Fuel and Fuel Additive (FFA) program. EPA implemented an electronic registration system for the FFA program in FY 2020; companies once registered may then introduce FFA products into commerce. Companies still submit related quarterly and annual FFA reports to the Agency in formats that require EPA to manually transcribe the information into its fuels database. EPA plans to incorporate FFA reports into the *eReporting* system in FY 2024 after implementing higher priority implementation needs in FY 2023.

Supporting Tribal, State and Local Governments

In FY 2024, EPA will continue to respond to significant requests from tribal, state and local governments for assistance in air quality planning, including SIPs, CAA-required mobile source programs, and transportation conformity determinations, especially for nonattainment areas working to attain the ozone and PM_{2.5} NAAQS. EPA will continue to work with tribal, state, and local governments to ensure the technical integrity of the mobile source emission estimates in their SIPs and any Tribal Implementation Plans (TIPs). In addition, EPA will assist states in developing Clean Air Act-required programs—such as new and existing motor vehicle inspection and maintenance (I/M), fuels, and vehicle miles travelled (VMT) offset programs—as well as identifying place-based control options and provide policy, technical, and modeling guidance for ozone nonattainment areas for the 2008 and 2015 ozone NAAQS of higher Clean Air Act classifications. In FY 2024, I/M programs will be required in approximately 30 states, summertime fuel programs will be required in over 20 states, with other CAA mobile source programs required in the most polluted areas in the country. In addition, in partnership with the Department of Transportation, EPA will ensure national consistency in how transportation conformity determinations are conducted across the U.S. and in the development of motor vehicle emissions budgets in SIPs, EPA’s adequacy findings on these budgets, and emission reduction strategies to ensure new transportation investments to support state air quality goals.

EPA will continue to provide regulations, guidance, state-of-the-science models (such as MOVES), and assistance to state and local agencies working on CAA-required PM_{2.5} and PM₁₀ hot-spot analyses. This will help protect public health in local communities, including communities of color and low-income communities with environmental justice concerns, near new or expanded highway and freight terminal projects with significant increases in diesel truck traffic. In addition, EPA will continue to provide regulations, guidance, and support to states with respect to existing I/M programs that focus on in-use vehicles and engines. Basic and/or Enhanced I/M testing is currently being conducted in almost 30 states with EPA technical and programmatic

guidance. EPA also will continue to provide regulatory actions and technical assistance to certain states considering changes or removal of low Reid Vapor Pressure (RVP) fuel programs. Finally, EPA will continue to develop methods for tribal, state and local agencies to quantify multi-pollutant emission reductions to address the NAAQS and climate change from available and newly emerging emission reduction strategies.

Prioritizing Environmental Justice

In FY 2024, EPA will continue to work with a broad range of stakeholders - including communities with environmental justice concerns - to develop targeted, sector-based, and place-based incentives for diesel fleets (including school buses, ports, and other goods movement facilities) to limit emissions from older diesel engines not subject to stringent emissions standards. Millions of people in the U.S. currently live and work near ports and can be exposed to air pollution associated with emissions from diesel engines at ports, including particulate matter, nitrogen oxides, ozone, and air toxics.⁴ The near-port communities that bear the brunt of air pollution from these diesel engines are often comprised of low-income populations and people of color. EPA will focus its efforts on reducing mobile source emissions in and around ports through EPA's Ports Initiative⁵ and the IRA Clean Ports funding. EPA will assist tribal, state, and local governments to reduce emissions in or near communities with environmental justice challenges to meet CAA SIP, transportation conformity, and other air quality planning requirements. EPA also is working with industry to bring about field testing and emissions testing protocols for a variety of innovative energy-efficient, emissions reducing technologies for the legacy fleet. As discussed above, EPA also will be establishing and implementing new emission standards for highway heavy-duty commercial vehicles, which is a high priority for many communities with environmental justice concerns.

Performance Measure Targets:

(PM CRT) Number of certificates of conformity issued that demonstrate that the respective engine, vehicle, equipment, component, or system conforms to all applicable emission requirements and may be entered into commerce.

	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	Units
Target		5,200	5,000	5,000	4,700	4,700	4,900	4,900	Certificates
Actual	5,109	4,869	4,711	4,843	5,351	5,196			

(PM RUL) Number of final rules issued that will reduce GHG emissions from light duty, medium-duty, and heavy-duty vehicles; electric utility generating units; and the oil and gas industry.

	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	Units
Target						No Target Established	No Target Established	No Target Established	Rules
Actual						1			

⁴ For more information, please see the DERA Fifth Report to Congress, August 2022 which may be found at: <https://nepis.epa.gov/Exec/QueryPDF.cgi?Dockey=P1015S8Q.pdf>

⁵ For more information, please visit <https://www.epa.gov/ports-initiative>.

FY 2024 Change from FY 2023 Enacted Budget (Dollars in Thousands):

- (+\$9,204.0) This change to fixed and other costs is an increase due to the recalculation of base workforce costs for existing FTE due to annual payroll increases, adjustments to provide essential workforce support, and changes to benefits costs. It also includes support for critical agencywide infrastructure for Executive Order 14028 cybersecurity requirements, electronic discovery for FOIA and litigation support, and implementation of Trusted Vetting 2.0.
- (+\$615.0) This change to fixed and other costs is an increase due to the recalculation of lab utilities.
- (+\$10,000.0) This program change is an increase for the Ann Arbor Facility Energy Saving Performance Contract (ESPC), which supports the ability of NVFEL to carry-out its mission-critical work of certifying vehicle compliance.
- (+\$42,282.0 / +45.8 FTE) This program change is an increase that supports program activities to address the climate crisis. This includes the development of analytical methods, regulations, and analyses to support climate protection by controlling greenhouse gas emissions from light duty, medium-duty, and heavy-duty vehicles. This program change also invests in the maintenance, repair, and replacement of aging test equipment at NVFEL. This investment includes \$9.295 million in payroll.
- (+\$175.0 / +1.0 FTE) This program change increases FTE to support agencywide implementation of EPA's Diversity, Equity, Inclusion, and Accessibility Strategic Plan and Evidence Act data stewardship and governance requirements.

Statutory Authority:

Title II of the Clean Air Act; Motor Vehicle Information Cost Savings Act; Alternative Motor Fuels Act of 1988; National Highway System Designation Act; Energy Policy Act of 1992; Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU); Energy Policy Act of 2005; Energy Independence and Security Act of 2007.

Enforcement

Forensics Support

Program Area: Enforcement

Goal: Enforce Environmental Laws and Ensure Compliance

Objective(s): Detect Violations and Promote Compliance

(Dollars in Thousands)

	FY 2022 Final Actuals	FY 2023 Enacted Operating Plan	FY 2024 President's Budget	FY 2024 President's Budget v. FY 2023 Enacted Operating Plan
<i>Science & Technology</i>	<i>\$14,815</i>	<i>\$15,532</i>	<i>\$18,657</i>	<i>\$3,125</i>
Hazardous Substance Superfund	\$1,676	\$1,240	\$1,648	\$408
Total Budget Authority	\$16,491	\$16,772	\$20,305	\$3,533
Total Workyears	71.6	70.3	76.3	6.0

Program Project Description:

The Forensics Support Program provides expert scientific and technical support for criminal and civil environmental enforcement cases, as well as technical support for the Agency's compliance efforts. EPA's National Enforcement Investigations Center (NEIC) is an environmental forensic center accredited for both laboratory analysis and field sampling operations that generate environmental data for law enforcement purposes. It is fully accredited under International Standards Organization (ISO) 17025, the main standard used by testing and calibration laboratories, as recommended by the National Academy of Sciences.⁶ The NEIC maintains a sophisticated chemistry and physical science laboratory and a corps of highly trained inspectors and scientists with expertise across environmental media. The NEIC works closely with EPA's Criminal Enforcement Program to provide technical support (e.g., sampling, analysis, consultation, and testimony) to criminal investigations. The NEIC also works closely with other EPA programs to provide technical support, consultation, on-site inspection, investigation, and case resolution services in support of the Agency's Civil Enforcement Program.

The Forensics Support Program will continue to provide expert scientific and technical support for EPA's criminal and civil enforcement efforts, focus its work on collecting and analyzing materials to characterize contamination, and attribute it to individual sources and/or facilities. The work NEIC performs typically represents the most complex cases nationwide, requiring a level of expertise and equipment not found elsewhere in EPA, as well as support to evaluate and leverage emerging technologies.

FY 2024 Activities and Performance Plan:

Work in this program directly supports Goal 3/Objective 3.2, Detect Violations and Promote Compliance in the *FY 2022 - 2026 EPA Strategic Plan*.

⁶ Strengthening Forensic Science in the United States: A Path Forward, National Academy of Sciences, 2009, available at: http://www.nap.edu/catalog.php?record_id=12589.

In FY 2024, the Agency requests an additional \$3.2 million and 4.8 FTE to ensure EPA has the capacity and technical expertise to investigate, analyze, sample, test, and transport hydrofluorocarbons (HFCs). EPA will support critical climate change initiatives, including forensics support of climate change enforcement efforts both in civil and criminal enforcement. This is vital to EPA's ability to enforce the HFC phase down regulations which are imperative to reducing climate impacts. NEIC will be making significant investments to assist with HFC-related enforcement capabilities, including inspector training, acquisition of field sampling equipment, and expansion of laboratory analytical capabilities to meet the urgent demand for highly complex HFC analysis. The additional funding also will support further development and deployment of the Agency's Geospatial Measurement of Air Pollution (GMAP) van, a mobile tool to help identify Clean Air Act noncompliance throughout the United States.

In FY 2024, in addition to EPA's request for \$22.1 million and 37.4 FTE to rebuild the inspector cadre through Compliance Monitoring and Civil Enforcement, the Agency requests an additional \$483.0 thousand and 1.0 FTE in Forensics Support to increase the Agency's capacity to complete critical civil inspections of facilities that affect communities with environmental justice (EJ) concerns. This investment will help the Agency complete more highly complex inspections, as well as provide critical inspection training to Agency, state, and local inspectors. The funding and FTE increase will bolster the Agency's impact by ensuring inspectors across the Agency and the United States have the basic technical knowledge to hold polluters accountable, especially in overburdened and underserved communities. The inspections and training provided by the additional FTE also will make an impact on combating climate change, identifying noncompliant facilities, and ensuring civil enforcement actions prevent further harm to the environment.

Effective enforcement relies on the best available science. In FY 2024, NEIC will strengthen our clean air and water protections, aligned with the Administration's goals to hold polluters accountable for their actions and provide relief to communities with EJ concerns across America. To achieve these goals, the Agency will employ NEIC's environmental forensics expertise to investigate violations of environmental statutes and prosecute environmental crimes in communities that are disproportionately affected by pollution and environmental crime, and to target those areas more effectively. NEIC supports EJ concerns by targeting critical industry inspections in overburdened or vulnerable communities. The NEIC utilizes data to work with the EPA regional office to take an enforcement action that could ultimately improve air and water quality around the United States and in communities with EJ concerns.

In FY 2024, NEIC will continue to streamline its forensics work and identify enhancements to the Agency's sampling and analytical methods, by using existing and emerging technology. The NEIC will continue to build on its previous progress to maximize the efficiency and effectiveness of its operations, produce timely and high-quality civil inspection reports, improve procurement processes, and continue to identify and implement further efficiencies in laboratory operations. NEIC will continue to enhance the work completed in FY 2021 and FY 2022 to support criminal and civil program efforts while also growing its support of EPA enforcement and compliance assurance programs. During FY 2021 and FY 2022, the NEIC accepted over 320 requests from all ten EPA regions for technical enforcement support. The results of these efforts will inform EPA's work in FY 2024 and beyond.

Performance Measure Targets:

EPA's FY 2024 Annual Performance Plan does not include annual performance goals specific to this program.

FY 2024 Change from FY 2023 Enacted Budget (Dollars in Thousands):

- (-\$519.0) This net change to fixed and other costs is a decrease due to the recalculation of base workforce costs for existing FTE due to annual payroll increases, adjustments to provide essential workforce support, changes to benefits costs, and changes to lab utilities and security costs.
- (+\$3,161.0 / +4.8 FTE) This program investment will ensure EPA has the capacity and technical expertise to investigate, analyze, sample, test, transport, and store HFCs. This investment includes \$877.0 thousand for payroll.
- (+\$483.0 / +1.0 FTE) This program investment will rebuild EPA's inspector cadre to ensure EPA has the capacity to complete critical civil inspections of facilities that affect communities with environmental justice (EJ) concerns. The additional funding and FTE will allow the Agency to complete, at a minimum, an additional 2.5 highly complex inspections as well as provide critical inspection training to agency, state, and local inspectors. This investment includes \$183.0 thousand for payroll.

Statutory Authority:

Reorganization Plan No. 3 of 1970, 84 Stat. 2086, as amended by Pub. L. 98–80, 97 Stat. 485 (codified at Title 5, App.) (EPA's organic statute); Act to Prevent Pollution from Ships (MARPOL Annex VI); Asbestos Hazard Emergency Response Act; Clean Air Act; Clean Water Act; Emergency Planning and Community Right-to-Know Act; Federal Insecticide, Fungicide, and Rodenticide Act; Marine Protection, Research, and Sanctuaries Act; Mercury-Containing and Rechargeable Battery Management Act; Noise Control Act; Oil Pollution Act; Resource Conservation and Recovery Act; Rivers and Harbors Act; Safe Drinking Water Act; Small Business Regulatory Enforcement Fairness Act; Toxic Substances Control Act; American Innovation and Manufacturing Act.

Homeland Security

Homeland Security: Critical Infrastructure Protection

Program Area: Homeland Security

Goal: Safeguard and Revitalize Communities

Objective(s): Prepare for and Respond to Environmental Emergencies

(Dollars in Thousands)

	FY 2022 Final Actuals	FY 2023 Enacted Operating Plan	FY 2024 President's Budget	FY 2024 President's Budget v. FY 2023 Enacted Operating Plan
Environmental Programs & Management	\$873	\$923	\$1,023	\$100
<i>Science & Technology</i>	<i>\$9,941</i>	<i>\$10,852</i>	<i>\$34,205</i>	<i>\$23,353</i>
Total Budget Authority	\$10,814	\$11,775	\$35,228	\$23,453
Total Workyears	26.1	26.6	57.6	31.0

Program Project Description:

Under the federal homeland security system, EPA is the Sector Risk Management Agency responsible for implementing statutory and Presidential directives relating to homeland security for the water sector. EPA's Water Infrastructure and Cyber Resilience program is implemented through close partnerships with the water sector, state emergency response and water program officials, and other federal agencies, most notably the Department of Homeland Security (DHS), the United States Army Corps of Engineers, and the Intelligence Community. The Water Security Program engages federal, state, and local entities in defining annual objectives and identifying high priorities for immediate action.

FY 2024 Activities and Performance Plan:

Work in this program directly supports Goal 6/Objective 6.3, Prepare for and Respond to Environmental Emergencies in the *FY 2022 - 2026 EPA Strategic Plan*.

This program provides critical resources to coordinate and support protection of the Nation's critical water infrastructure from terrorist threats and all-hazard events. In FY 2024, EPA will continue to provide exercises and technical support to approximately 1,500 water utilities, state officials, and federal emergency responders to become more resilient to any natural or manmade incident that could endanger drinking water and wastewater services, with an emphasis on the threats posed by climate change and cybersecurity. EPA will provide tools, exercises, and technical assistance which will address the highest risks confronting the water sector. In providing this assistance, EPA will provide direct technical assistance and will seek to engage disadvantaged and underserved communities, some of which may lack the technical capacity and resources to undertake preparedness and response actions in the absence of such external support.

The Program also supports the Agency's Infrastructure Investment and Jobs Act (IIJA) implementation priorities including preparing for and responding to climate change events and cybersecurity challenges so that water systems are more resilient. For instance, in providing guidance and training associated with IIJA funding, EPA has leveraged its internal cybersecurity

expertise to identify the types of eligible projects for water systems, promote awareness of the availability of these funds as well as the application process, during the Agency's extensive training and technical assistance efforts with the sector.

Natural Disasters, Climate Change, and General Preparedness

Drought, floods, hurricanes, and other natural disasters represent a high risk to the water sector owing to their frequency of occurrence, their enormous potential for destruction, and the exacerbating effects of climate change. As evident from several recent natural disasters, the level of preparedness within the water sector varies significantly—with many utilities lacking adequate preparedness capabilities. In FY 2024, EPA will continue to improve the preparedness of the water sector by providing nationwide exercises and technical support to address natural disasters and general preparedness with the objective to train water and wastewater systems, state officials, and emergency response partners. In FY 2022, more than 1,000 drinking water and wastewater systems and water sector partners received training and technical assistance.

Climate change and associated extreme weather events directly threaten water systems' ability to fulfill their public health and environmental missions as evident from the devastation borne by events like hurricanes Ian and Fiona and the decadal long drought and wildfires in the West. The EPA Creating Resilient Water Utilities (CRWU) initiative advances the long-term sustainability of the water sector by enabling utility owners and operators to integrate climate change considerations into their routine planning practices. CRWU provides innovative, but readily accessible, electronic tools that enable water systems to adapt to climate change and enhance their resiliency, including through infrastructure improvement plans.

Specifically, EPA will:

- Provide in-person or virtual exercises, workshops, and technical assistance to the water sector, including Incident Command System / National Incident Management System exercises; drought response; flood response; state functional exercises (e.g., scenarios of hurricanes, floods, and earthquakes); resource typing and site access workshops; and regional interstate emergency response exercises (e.g., hurricane).
- Integrate new climate projection data into the flagship climate risk assessment tool, the Climate Resilience Evaluation and Awareness Tool (CREAT), which incorporates the latest projection data for precipitation, temperature, sea-level rise, storm surge components, and hydrologic changes. EPA will continue to provide extensive nationwide training sessions for drinking water and wastewater systems as well as a series of train-the-trainer forums for technical assistance providers to reach smaller utilities, with a significant focus on overburdened and underserved communities. EPA also will provide direct technical assistance to large, medium, and small drinking water and wastewater utilities across the country applying CREAT and other CRWU tools, including through developing infrastructure improvement plans and shepherding systems through the IJA application process.
- Support the water sector in preparing for and responding to supply chain disruptions that have the potential to impact the availability of water treatment chemicals and other critical materials needed for drinking water and wastewater system operation by: 1) reviewing and

processing applications submitted under the authorities of the Safe Drinking Water Act (SDWA) Section 1441 and the Defense Production Act; 2) providing general guidance and direct technical assistance to water systems, state primacy agencies, and other water sector stakeholders experiencing supply challenges; 3) assessing the supply chain for critical water treatment chemicals in order to determine the risk of disruptions that could impact the water sector; and 4) offering a platform for tracking and sharing information about emerging and ongoing supply chain issues with the potential to impact water system operations.

- Conduct tabletop and functional exercises to improve the operation of intra-state and inter-state mutual aid agreements among water utilities.
- Implement lessons learned from the most recent hurricane seasons, as identified by reports from the Federal Emergency Management Agency (FEMA), the Water Agency Response Network, and EPA's Inspector General.
- Address high priority security areas, as identified in the stakeholder generated *Roadmap to a Secure and Resilient Water and Wastewater Sector* to be completed in 2023,⁷ with an emphasis on the following four priorities: 1) promoting the awareness of the critical lifeline status of the drinking water and wastewater sector and translating that definition into strong support for the sector's needs and capabilities; 2) improving detection of, response to, and recovery from contamination incidents; 3) advancing preparedness and improving capabilities of the drinking water and wastewater sector for area-wide loss of water and power; and 4) advancing recognition of vulnerabilities and needed responses related to cybersecurity risk management.
- Conduct nationwide exercises with three critical, inter-dependent sectors: healthcare, emergency services, and energy. Most incidents, particularly natural disasters, have underscored the mutual reliance on the water sector with other lifeline sectors. Through exercises and technical support with officials at the local, state, and federal levels from these other sectors, EPA will seek to improve coordination among critical lifeline sectors.
- Sustain operation of the Water Desk in both the Agency's Emergency Operations Center and FEMA's National Response Coordination Center in the event of an emergency by updating roles and responsibilities, training staff in the incident command structure, ensuring adequate staffing during activation of the desk, and coordinating with EPA's regional field personnel and response partners.
- Develop annual assessments, as required under the National Infrastructure Protection Plan, to describe existing water security efforts and progress in achieving the sector's key metrics.

⁷For more information, please see:

https://www.waterisac.org/sites/default/files/public/2017_CIPAC_Water_Sector_Roadmap_FINAL_051217.pdf.

Water Security Initiative (WSI)

WSI addresses the risk of contamination of drinking water distribution systems. It has designed and developed an effective system for timely detection and appropriate response to drinking water contamination threats and incidents through a pilot program that has broad application to the Nation's drinking water utilities in high-threat cities. The FY 2024 request includes \$4.8 million for necessary WSI Surveillance and Response System (SRS) activities to: 1) continue refining technical assistance products based on the five full-scale SRS pilots; 2) implement a monitoring and response program for water utilities focused on source water chemical spills; and 3) provide direct technical assistance, as requested by water utilities, that seeks to leverage EPA's expertise in deploying their own warning system.

In FY 2024, EPA will:

- Continue efforts to promote the water sector's adoption of Water Quality Surveillance and Response Systems (WQ-SRS). EPA will facilitate user forums and promote the use of available tools and materials to design and implement a WQ-SRS. These capabilities will help water systems rapidly detect and respond to water quality problems, such as contamination in the distribution system, to reduce public health and economic consequences.
- Build upon the Drinking Water Mapping Application to Protect Source Waters (DWMAPS)⁸ and the new chemical spill and storage notification requirements in the America's Water Infrastructure Act of 2018 (AWIA). EPA will continue to collaborate with water sector stakeholders, water utilities, and state environmental agencies, to identify specific information (*e.g.*, what chemicals are stored upstream from a surface water intake), including Emergency Planning and Community Right-to-Know Act (EPCRA) Tier 2 data, that is valuable to creating a comprehensive source water contamination threat inventory. EPA will develop guidance and a comprehensive listing of state and federal information resources that can be used to identify potential sources of contamination. This effort will help to ensure that drinking water utilities have access to the basic information (*e.g.*, what chemicals are stored upstream from a surface water intake) necessary for understanding the risk of releases to their sources of drinking water, as required under AWIA Section 2013, and take steps to mitigate those risks.
- Provide technical support to EPA regions, state primacy agencies, and water systems during response to contamination incidents. EPA's Water Program has been providing technical assistance on contamination response for several years (*e.g.*, following wildfires, the jet fuel contamination incident in Honolulu, Hawaii) and anticipates that requests for this type of support will continue.

Water Laboratory Alliance (WLA)

In a contamination event, the sheer volume or unconventional type of samples requiring analysis could quickly overwhelm the capacity or capability of a single laboratory. To address this potential deficiency, EPA has established the national WLA comprised of laboratories from the local (*e.g.*,

⁸ For more information, please see: <https://www.epa.gov/sourcewaterprotection/drinking-water-mapping-application-protect-source-waters-dwmaps>.

water utility) to the federal level (*e.g.*, the Centers for Disease Control and Prevention’s Laboratory Response Network). In FY 2024, EPA will continue to promote, through exercises, expert workshops, and association partnerships, the WLA Plan.⁹ The plan provides a protocol for coordinated laboratory response to a surge of analytical needs. Approximately 30 exercises or workshops were completed in FY 2022. In FY 2024, under the WLA, EPA plans to train approximately 50 laboratories to improve their ability to handle potential problems associated with surge capacity and analytical method capabilities during an emergency.

In FY 2024, EPA will:

- Continue to work with regional and state environmental laboratories to conduct exercises and continue efforts to automate the exercises, enabling laboratories and other members of the water sector to participate in exercises simultaneously and continue the innovative practice of pursuing validation of methods through exercises.
- Continue to expand the membership of the WLA with the intention of achieving nationwide coverage. The WLA has 160 member laboratories that are geographically diverse and can provide a wide range of chemical, biological, and radiological analyses.¹⁰ For the WLA to become a robust network that can cover major population centers and address a diverse array of high priority contaminants, membership must continue to increase.
- Develop guidance and training for flushing contaminated premise plumbing systems that are based on the best available science and validated through both pilot-scale demonstration and computer simulation.

Cybersecurity

Cybersecurity represents a substantial concern for the water sector, given the ubiquitous access to critical water treatment systems from the internet. Recent attacks by outside actors and their clear potential to disrupt essential lifeline services, such as drinking water supplies, are prompting a growing recognition that the federal government should adopt a more aggressive posture towards cybersecurity. In addition to expanding direct technical assistance, and in discussions with the National Security Council and the states, EPA, in FY 2023, issued an interpretive rule to clarify the existing obligation for states, under EPA regulations established under the SDWA, to consider cybersecurity of water systems in regular audits of public water systems. As water systems contend with a hostile cybersecurity environment in which state or state sponsored actors seek to disrupt the critical lifeline services of the water sector, this regulatory action will yield significant progress in the Nation’s efforts to secure our critical infrastructure. Critical to this regulatory action, EPA will work to provide training and guidance to each state, territory, and tribe as well as to water systems in order to build their technical capacity to assess and mitigate cybersecurity risks during sanitary surveys.

⁹ For more information, please see: <https://www.epa.gov/waterlabnetwork>.

¹⁰ For more information, please see: <https://www.epa.gov/dwlabcert/contact-information-certification-programs-and-certified-laboratories-drinking-water>.

In FY 2024, EPA will continue to fulfill its obligations under Executive Order 13636: *Improving Critical Infrastructure Cybersecurity*,¹¹ which designated EPA as the lead federal agency responsible for cybersecurity in the water sector. EPA will continue to conduct nationwide exercises and provide technical support on cybersecurity threats and countermeasures for about 200 water and wastewater utilities.

In FY 2024, EPA is requesting additional resources and FTE to:

- Issue guidance documents and conduct a national training program on evaluating cybersecurity practices at public water systems to support states and tribes with direct implementation responsibilities (in support of the regulatory action in FY 2023). EPA expects to provide corresponding guidance materials and training to help public water systems understand and strengthen the cybersecurity practices that may be assessed during a state audit.
- Offer targeted training on the guidance documents to all public water systems and all states and intends to provide a Cybersecurity Technical Support Center which will function to respond rapidly to inquiries from both states and water systems regarding the assessment of cyber risk and the identification of countermeasures to mitigate risk. This training and technical assistance work represents an unprecedented and substantial effort necessary to ensure robust implementation of and compliance with the cybersecurity interpretive regulation.
- Transition the Water Sector Cybersecurity Evaluation Program from an onsite cybersecurity assessment effort targeting about 100 water systems each year to a virtual assistance program providing direct technical support to thousands of water systems. Under this initiative, EPA will assess cybersecurity practices at water systems as requested by the system or the state. EPA will provide a report to the system that shows gaps in cybersecurity, including potential significant deficiencies. The Public Water System (PWS) would provide this report to the state to review during the sanitary survey pursuant to the cybersecurity regulation.
- Implement the Cybersecurity Technical Assistance Program for the Water Sector. Under this program, states and PWS' can submit questions or request to consult with a subject matter expert (SME) regarding cybersecurity in PWS sanitary surveys, such as identifying whether a cybersecurity gap is a significant deficiency or selecting appropriate risk mitigation actions. EPA will strive to have an SME respond to the questioner within two business days. As with the cybersecurity training work, the Water Sector Cybersecurity Evaluation Program and the Cybersecurity Technical Assistance Program constitute a critical investment of resources vital to achieving the policy outcome of the regulatory action, i.e., the reduction of cybersecurity risk across the Nation's water systems.

¹¹ For more information, please see: <https://www.dhs.gov/publication/executive-order-13636-improving-critical-infrastructure-cybersecurity>.

- Conduct classroom exercises, at locations across the country, on water sector cybersecurity. The exercises will address cybersecurity threats (including ransomware), vulnerabilities, consequences, best practices, and incident response planning.
- Update and/or develop new course materials to respond to the evolving nature of cybersecurity threats. One example of such updates are the FY 2022 alerts and training concerning the potential for Russian-state actors to infiltrate water system industrial control processes and business enterprise functions.
- EPA also is requesting \$25 million for a Cybersecurity grant, under the STAG appropriation, to help water systems establish or update the necessary cybersecurity infrastructure to address the rising threats from sophisticated state actors and criminal organizations. These funds would enable water systems to adopt basic cybersecurity hygiene measures, the inadequate adoption of which, across the sector, has rendered water systems and the communities they sustain at high risk from disabling cyberattacks.

AWIA

In FY 2024, EPA will continue its efforts to fulfill the requirements of the Community Water System Risk and Resilience section of AWIA. Specifically, EPA will prepare community water systems, subject to the law, for the second round of certifications which are due beginning in 2025. AWIA requires each community water system, serving more than 3,300 persons, to review its risk and resilience assessment at least once every five years to determine if it should be revised. Upon completion of such a review, the system must submit to EPA a certification that it has reviewed its assessment and revised it, if applicable. Further, each community water system, serving more than 3,300 persons, must review and, if necessary, revise its emergency response plan at least once every five years after the system completes the required review of its risk and resilience assessment. The emergency response plan must incorporate any revisions to the risk and resilience assessment. Upon completion of this review, but not later than six months after certifying the review of its risk and resilience assessment, the system must submit a certification that it has reviewed its emergency response plan and revised it, if applicable. EPA will apply lessons learned from the first round of certifications to refine guidance, tools (*e.g.*, emergency response plan templates), training, and the online certification portal. EPA also will provide individual technical assistance to water systems to help with the recertification requirements of AWIA.

Performance Measure Targets:

(PM DW-07) Number of drinking water and wastewater systems, tribal and state officials, and water sector partners provided with security, emergency preparedness, and climate resilience training and technical assistance.

	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	Units
Target						2,000	3,500	3,500	Systems and Partners
Actual						3,939			

FY 2024 Change from FY 2023 Enacted Budget (Dollars in Thousands):

- (-\$84.0) This change to fixed and other costs is a decrease due to the recalculation of base workforce costs for existing FTE due to annual payroll increases, adjustments to provide essential workforce support, and changes to benefits costs.
- (+\$19,559.0 / +25.0 FTE) This program change requests an increase of resources and FTE to implement regulatory actions to mitigate the risks of cyberattacks in the water sector as well as increase the Agency's ability to respond to cyber incidents. This investment includes \$4,559.0 thousand in payroll costs and essential workforce support costs.
- (+\$3,878.0 / +6.0 FTE) This program change requests an increase of resources and FTE to support the Water Sector Cybersecurity Program to enhance cyber incident preparation, response, recovery, information sharing, and intelligence for water utilities to protect infrastructure. This investment includes \$1,094.0 thousand in payroll costs and essential workforce support costs.

Statutory Authority:

Safe Drinking Water Act, §§ 1431-1435; Clean Water Act; Public Health Security and Bioterrorism Emergency and Response Act of 2002; Emergency Planning and Community Right-to-Know Act, §§ 301-305.

Homeland Security: Preparedness, Response, and Recovery

Program Area: Homeland Security

Goal: Safeguard and Revitalize Communities

Objective(s): Prepare for and Respond to Environmental Emergencies

(Dollars in Thousands)

	FY 2022 Final Actuals	FY 2023 Enacted Operating Plan	FY 2024 President's Budget	FY 2024 President's Budget v. FY 2023 Enacted Operating Plan
<i>Science & Technology</i>	<i>\$24,536</i>	<i>\$25,347</i>	<i>\$39,539</i>	<i>\$14,192</i>
Hazardous Substance Superfund	\$35,026	\$34,661	\$56,484	\$21,823
Total Budget Authority	\$59,561	\$60,008	\$96,023	\$36,015
Total Workyears	121.8	124.1	138.3	14.2

Program Project Description:

Exposure to hazardous chemical agents, microbial pathogens, and radiological materials released into the environment could pose catastrophic consequences to the health of first responders and American citizens. EPA has responsibility, under legislation and Presidential Directives, to remediate contaminated environments created by incidents such as terrorist attacks, industrial accidents, or natural disasters.

EPA's disaster-related research topics under the Homeland Security Research Program (HSRP) are: 1) contaminant characterization and consequence assessment; 2) environmental cleanup and infrastructure remediation; and 3) community engagement and systems-based tools supporting resilience equity.

The research conducted supports EPA to carry out its primary mission essential function to help communities prepare for, endure, and recover from disasters – safeguarding their economic, environmental, and social well-being. Researchers, within the HSRP, collaborate with states, local communities, tribes, private sector organizations, and key federal agencies¹² to prioritize research needs and prevent the duplication of scientific and technical work. The HSRP delivers effective tools, methods, information, and guidance to local, tribal, state, and federal decision-makers that address both critical terrorism related issues and natural or manmade disasters.

EPA also is responsible for operating and maintaining the network of near real-time radiation monitors, known as RadNet, under the Nuclear/Radiological Incident Annex to the National Response Framework. This network is critical in responding to large-scale incidents such as the accident at the Fukushima nuclear facility and is an EPA Critical Infrastructure/Key Resource asset. This monitoring network is supported by the IT system known as ARaDS, the Analytical Radiation Data System.

¹² Partners include: Department of Homeland Security (DHS), Department of Defense (DOD), Centers for Disease Control and Prevention (CDC), Federal Bureau of Investigation (FBI), National Institute of Health (NIH), National Science Foundation (NSF), Department of Energy (DOE), and Department of Agriculture (USDA).

Recent Accomplishments of the Homeland Security Research Program Include:¹³

Supporting COVID-19 Response and Pandemic Preparedness:

EPA's HSRP researchers worked with program and regional office partners and other federal, state, and local stakeholders (including CDC, DHS, the New York City Metro Transit Authority, the Los Angeles Metro, and many others) to provide timely and reliable information to address Agency and stakeholder research needs related to COVID-19 and future pandemic preparedness. The research and technical support provided was used by EPA and other stakeholders to make informed decisions, develop federal guidance, and support strategies and investments. The research focused on determining the effectiveness against SARS-CoV-2 and viral surrogates for disinfection products, devices, and methods including:

- Hot-water laundering of clothing and PPE¹⁴
- Parameters influencing the use of electrostatic sprayers for applying disinfectants¹⁵
- Cleaning methods¹⁶ and disinfectant application to real-world surfaces¹⁷ and evaluation of potential long-lasting or residual disinfectants^{18,19} and copper film in high-touch, high-traffic areas²⁰
- Germicidal UV devices and their application²¹
- New analytical approaches for environmental samples that reduce time for analyses results²²
- Aerosol treatment technologies to reduce transmission risk in indoor spaces including both physical (e.g., filters, germicidal UV) and chemical methods²³

The Agency also held regular meetings with federal, tribal, state, and local governments to provide updates on the results and seek input related to on-going needs.

Improving Preparedness for Radiological/Nuclear Incident Response:

EPA's HSRP researchers significantly advanced capabilities to respond to a radiological and nuclear incident. Waste management is critical for effective response to radiological and nuclear incidents, specifically to address large amounts of radiological contaminants. Various waste management approaches and tools were developed and evaluated to minimize the waste amount and enable more effective decision making during cleanup efforts.^{24,25,26} EPA's HSRP researchers developed a method to effectively treat radioactively contaminated washwater to remove

¹³ For a more complete view of accomplishments, please see: <https://www.epa.gov/research/national-research-programs>.

¹⁴ For more information, please see: <https://dx.doi.org/10.3791/64164>.

¹⁵ For more information, please see: <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0257434>.

¹⁶ For more information, please see: <https://doi.org/10.1080/15459624.2021.2015075>.

¹⁷ For more information, please see: <https://doi.org/10.1080/15459624.2022.2088768>.

¹⁸ For more information, please see: <http://doi.org/10.1111/jam.15339>.

¹⁹ For more information, please see: <https://doi.org/10.1111/jam.15437>.

²⁰ For more information, please see: <https://pubmed.ncbi.nlm.nih.gov/34695284/>.

²¹ For more information, please see: <http://doi.org/10.1111/lam.13770>.

²² For more information, please see: <https://doi.org/10.1016/j.jviromet.2021.114251>.

²³ For more information, please see: <https://www.epa.gov/covid19-research>.

²⁴ For more information, please see: <https://www.sciencedirect.com/science/article/pii/S2352186420314772>.

²⁵ For more information, please see: https://cfpub.epa.gov/si/si_public_record_Report.cfm?Lab=CESER&dirEntryID=352958.

²⁶ For more information, please see: https://cfpub.epa.gov/si/si_public_file_download.cfm?p_download_id=544137.

radioactive contaminants via ad hoc sand/clay filtration beds and enable this treated washwater to be reused during continuing cleanup operations.²⁷

Radiological release incidents can potentially contaminate widespread areas with radioactive materials and decontamination efforts are typically focused on populated areas, which means radionuclides may be left in forested areas for long periods of time. Large wildfires in contaminated forested areas have the potential to reintroduce these radionuclides into the atmosphere and cause exposure to first responders and downwind communities. EPA researchers investigated how radioactive contaminants would behave during wildland fires in contaminated forests.²⁸ These methods, tools, and information will help responders to prepare for and respond to wide area radiological and nuclear incidents.

Continued Efforts to Enhance Bio Incident Response:

EPA continues to develop extensive protocols and tools for sampling, analysis, and decontamination methods and strategies that continue to significantly enhance our collective national preparedness to respond to biological contamination incidents. Researchers developed a protocol for detection of ricin biotoxin in environmental samples and this protocol allows for easy comparison and interpretation of sample analysis results. This protocol helps local and state public health agencies, environmental unit leaders, and risk assessors to work together, in a unified way, to make the best decisions possible during a response to an incident.²⁹ EPA researchers also developed an interactive “ready-to-go” tool to design sampling and analysis plans for biological incident response.³⁰ Researchers identified and applied user-friendly tools that more easily facilitate the acquisition of field sampling data and subsequent management of sampling data following a wide-area incident.³¹ EPA researchers provided decision makers with a practical summary of the latest information on the material compatibility of decontamination techniques that have been found to be effective in inactivating biological agents such as *Bacillus anthracis* spores on different materials.³² EPA researchers recently worked with the United States Coast Guard (USCG) to apply EPA’s analysis methods for biological incident response at USCG facilities and assets.³³ These research products have addressed essential capability gaps and significantly improved the preparedness of EPA and its partners (such as USCG) and stakeholders, for responding to and recovering from a wide-area release of a persistent biological agent.

Tackling Challenging Chemicals for Environmental Cleanup:

The release of toxic chemicals to the environment, such as chemical warfare agents (e.g., venomous agent [VX], sulfur mustard [HD]), will create an acute and significant exposure risk to the public as well as remediation contractors who would be tasked to cleanup a contaminated site. It may be difficult to decontaminate such impacted environments safely and quickly. EPA tested several decontamination options to address this challenge. Researchers evaluated a hydrogen peroxide vapor method using low-cost indoor humidity control systems for the remediation of

²⁷ For more information, please see: https://cfpub.epa.gov/si/si_public_record_Report.cfm?dirEntryId=353143&Lab=CESER.

²⁸ For more information, please see: <https://www.sciencedirect.com/science/article/pii/S0048969721039449>.

²⁹ For more information, please see: https://cfpub.epa.gov/si/si_public_record_Report.cfm?dirEntryId=355320&Lab=CESER.

³⁰ For more information, please see: <https://www.epa.gov/esam/sampling-and-analysis-plan-sap-template-tool-addressing-environmental-contamination-pathogens>.

³¹ For more information, please see: https://cfpub.epa.gov/si/si_public_record_Report.cfm?dirEntryId=353479&Lab=CESER.

³² For more information, please see: https://cfpub.epa.gov/si/si_public_file_download.cfm?p_download_id=544599&Lab=CESER.

³³ For more information, please see: https://cfpub.epa.gov/si/si_public_record_Report.cfm?dirEntryId=353716&Lab=CESER.

surfaces contaminated with persistent chemical warfare agents and toxic pesticides.³⁴ In addition, the agency evaluated various commercially available decontamination solutions for fentanyl, evaluating their effectiveness on common surfaces inside buildings. Fentanyl is a commonly abused substance in the class of drugs known as opioids that is 80–100 times more potent than morphine.³⁵ These research efforts provide practical information to make critical decisions during remediation of contaminated buildings or infrastructure.

FY 2024 Activities and Performance Plan:

Work in this program directly supports Goal 6/Objective 6.3, Prepare for and Respond to Environmental Emergencies in the *FY 2022 - 2026 EPA Strategic Plan*.

Research is planned and prioritized based on the needs of end-users of this science, including EPA program and regional offices (e.g., Regional On-Scene Coordinators), water utility companies, states, local communities, territories, and tribes.

In FY 2024, the Homeland Security Research Program will conduct research under the three disaster-related research topics.

With respect to contaminant characterization and consequence assessment, HSRP will:

- Develop a sampling strategy for radioactive waste generated due to incident debris and by cleanup operations following a radioactive/nuclear wide area incident and develop Sampling and Analysis Plan (SAP) template tool for radioactively contaminated building materials.
- Update pathogen air sample processing methods in EPA's sampling and analysis method (Selected Analytical Methods [SAM]).³⁶
- Improve a Gaussian dispersion model (such as the American Meteorological Society/Environmental Protection Agency Regulatory Model [AERMOD]³⁷) to better account for the flow and dispersion of chemical, biological, and radiological contaminants within built high rise environments.
- Investigate the effects of environmental conditions on the risk of exposure to resuspended bacterial spores in the outdoor environment during the first few weeks post-release to support the critical early period of response and recovery efforts.

With respect to Environmental Cleanup and Infrastructure Remediation, which includes biological incidence response preparation, water infrastructure protection, chemical incident response preparation, and waste management support, HSRP will:

³⁴ For more information, please see:

https://cfpub.epa.gov/si/si_public_record_report.cfm?dirEntryId=353126&Lab=CESER&personid=23379&role=Any.

³⁵ For more information, please see: <https://www.sciencedirect.com/science/article/pii/S030147972101389X>.

³⁶ For more information, please see: <https://www.epa.gov/esam/selected-analytical-methods-environmental-remediation-and-recovery-sam>.

³⁷ For more information, please see: <https://www.epa.gov/scram/air-quality-dispersion-modeling-preferred-and-recommended-models>.

- Support future pandemic preparedness through conducting BSL-1 through BSL-3³⁸ research to support the development of standard efficacy testing methods and criteria for air treatment technologies for airborne biological agents. Research will include both physical (e.g., germicidal ultraviolet, filtration) and chemical antimicrobial methods. In FY 2024, EPA is requesting an additional \$1 million that will be used to expand EPA's capabilities and conduct research at its BSL-3 facility in Fort Meade, MD.
- Develop decontamination methods for biological agents at the appropriate BSL that can effectively minimize the risk of transmission from environmental matrices, including research useful to supporting reducing environmental transmission in pandemic or other naturally occurring outbreaks.
- Conduct cybersecurity research to assess the impact a cyberattack can have on drinking water infrastructure.
- Develop a searchable database that will allow users to select parameters and generate a data report on Water Infrastructure Decontamination methods in response to chemical, biological, and radiological contamination.
- Assess the efficacy of chlorine dioxide fumigation under various operational conditions for fentanyl decontamination and improve the decontamination strategy and technology selection tool (DeconST) to include fentanyl decontamination data.
- Assess the impact and effectiveness of natural rain wash-off from roads to hosing down areas for gross decontamination for chemical contamination.
- Develop a prototype drone platform for autonomously identifying and estimating amounts (mass, volume) of various types of waste following a radiological incident.
- Assess traditional sludge disposal methods (incineration and composting) for sludge contaminated with persistent bio agents (e.g., *Bacillus* spores).
- Improve usability and cost efficiency for the Homeland Security Research Program's waste staging and logistics tools in response to chemical, biological, radiological, nuclear, and natural disasters.
- Develop safe personal protective equipment (PPE) prototypes that can reduce waste and be re-printed/manufactured.

To advance Community Engagement and Systems-Based Tools Supporting Resilience Equity in FY 2024, HSRP research efforts will:

- Evaluate technologies for data collection and management, including geospatial and mapping applications, during all incident response and recovery phases. As part of the evaluation, recommendations for improving these existing technologies will be identified.
- Identify and evaluate tools for making decisions associated with sampling, decontamination, and waste management and the interdependencies among these decisions during all incident response and recovery phases.

³⁸ BSL: Biosafety Levels. BSL-1 is the basic level of protection and is appropriate for defined and characterized strains of viable biological agents that are not known to cause disease in immunocompetent adult humans. BSL-2 is for handling moderate-risk agents that cause human disease, of varying severity, by ingestion or through percutaneous or mucous membrane exposure. BSL-3 is appropriate for agents with a known potential for aerosol transmission, for agents that may cause serious and potentially lethal infections, and that are indigenous or exotic in origin. For further information, please see: https://www.cdc.gov/labs/BMBL.html?CDC_AA_refVal=https%3A%2F%2Fwww.cdc.gov%2Fbiosafety%2Fpublications%2Fbmb15%2Findex.htm.

- Improve the usability of the water and waste infrastructure systems tools by incorporating community needs determined by examining how communities are thinking and talking about climate change, specifically how they are incorporating projections into planning and preparedness.
- Conduct research to help state, local, tribal, and territorial agencies include social considerations as they make decisions about managing disaster wastes and debris by developing best practices, trainings, how-to guides, and decision-logic models to support organizations in their decision making. This research covers the design and testing of tools and resources to help communities build resilience and equity.

Radiation Monitoring

The RadNet fixed monitoring network provides near real-time radiation monitoring coverage near each of the 100 most populous U.S. cities, as well as expanded geographic coverage for a total of 140 monitoring sites. The RadNet air monitoring network provides the Agency, first responders, and the public with greater access to data. Should there be a radiological emergency, RadNet improves officials' ability to make decisions about protecting public health and the environment during and after the incident. Additionally, RadNet data is used by scientists to better characterize the effect of a radiological incident.

In FY 2024, the Agency will continue to operate the RadNet air monitoring network, continue to add exposure rate meter capability to the network, and provide essential maintenance to the network. To best maximize resources, exposure rate meter capability will be added to monitors when needed repairs are called for. This expansion will enhance the federal government's ability to effectively communicate radiation measurement information to the public and to non-technical decision makers after a radiological release. In addition to aiding in explaining data to the public and decision makers, the addition of exposure rate meters aligns EPA's monitoring system with that of the international community.

In FY 2024, EPA is requesting an additional \$12.1 million and 9.5 FTE to update the aging equipment that monitors the nation's air for radiation. As a part of this, EPA also will modernize IT infrastructure for the ARaDS and support enhanced lab and field office facility operations and maintenance.

Research Planning

EPA research is built around six integrated and transdisciplinary research programs. Each of the six programs is guided by a Strategic Research Action Plan (StRAP) that reflects the research needs of Agency program and regional offices, states, and tribes, and is planned with their active involvement. Each research program has developed and published their fourth generation of the StRAPs³⁹, which continue the practice of conducting innovative scientific research aimed at solving the problems encountered by the Agency and its stakeholders.

EPA's Office of Research and Development (ORD) ensures the integrity and value of its research through a variety of mechanisms that include:

³⁹ The StRAPs are available here: <https://www.epa.gov/research/strategic-research-action-plans-fiscal-years-2023-2026>.

- EPA’s Board of Scientific Counselors (BOSC)
 - ORD meets regularly with this committee, which provides advice and recommendations to ORD on technical and management issues of its research programs.
- State Engagement
 - EPA’s state engagement⁴⁰ is designed to inform states about their role within EPA and EPA’s research programs and to better understand the science needs of state environmental and health agencies.
- Tribal Partnerships
 - Key Tribal partnerships are established through the Tribal Science Program which provides a forum for the interaction between Tribal and Agency representatives. These interactions identify research of mutual benefit and lead to collaborations on important tribal environmental science issues.

Performance Measure Targets:

Work under this program supports performance results in the Research: Chemical Safety and Sustainability Program under the S&T appropriation.

FY 2024 Change from FY 2023 Enacted Budget (Dollars in Thousands):

- (+\$474.0) This change to fixed and other costs is an increase due to the recalculation of base workforce costs for existing FTE due to annual payroll increases, adjustments to provide essential workforce support, and changes to benefits costs.
- (-\$109.0) This change to fixed and other costs is a decrease due to the recalculation of lab fixed costs.
- (+\$1,000.0) This program change will expand EPA’s capabilities and allow EPA to conduct research at its BSL-3 facility in Fort Meade, MD.
- (+\$735.0 / +1.7 FTE) This program change is an increase in resources and FTE to support research efforts to identify and address emerging threats to the water sector. This includes \$313.0 thousand in payroll costs.
- (+\$12,092.0 / + 9.5 FTE) This program change is an increase to update the aging equipment that monitors the nation’s air for radiation. This also will support and modernize IT infrastructure for ARaDS and support enhanced lab and field office facility operations and maintenance. This investment includes \$1,764.0 thousand in payroll costs.

Statutory Authority:

Atomic Energy Act of 1954; Clean Air Act, §§ 102, 103; Safe Drinking Water Act, §§ 1431-1435, 1442; Robert T. Stafford Disaster Relief and Emergency Assistance Act; National Defense

⁴⁰ For more information, please see: <https://www.epa.gov/research/epa-research-solutions-states>.

Authorization Act for Fiscal Year 1997, §§ 1411-1412; Public Health Security and Bioterrorism Preparedness and Response Act of 2002; Toxic Substances Control Act, § 10; Oil Pollution Act; Pollution Prevention Act; Resource Conservation and Recovery Act; Emergency Planning and Community Right-to-Know Act; Clean Water Act; Federal Insecticide, Fungicide, and Rodenticide Act; Federal Food, Drug, and Cosmetic Act; Food Quality Protection Act; Food Safety Modernization Act, §§ 203, 208.

Homeland Security: Protection of EPA Personnel and Infrastructure

Program Area: Homeland Security

Goal: Safeguard and Revitalize Communities

Objective(s): Prepare for and Respond to Environmental Emergencies

(Dollars in Thousands)

	FY 2022 Final Actuals	FY 2023 Enacted Operating Plan	FY 2024 President's Budget	FY 2024 President's Budget v. FY 2023 Enacted Operating Plan
Environmental Programs & Management	\$4,903	\$5,188	\$5,158	-\$30
<i>Science & Technology</i>	<i>\$501</i>	<i>\$625</i>	<i>\$501</i>	<i>-\$124</i>
Building and Facilities	\$7,049	\$6,676	\$6,676	\$0
Hazardous Substance Superfund	\$1,201	\$1,029	\$1,530	\$501
Total Budget Authority	\$13,653	\$13,518	\$13,865	\$347
Total Workyears	12.0	13.3	9.2	-4.1

Total workyears in FY 2024 include 9.2 FTE to support Homeland Security Working Capital Fund (WCF) services.

Program Project Description:

This program supports activities to ensure that EPA's physical structures and assets are secure and operational and that physical security measures are in place to help safeguard staff in the event of an emergency. These efforts also protect EPA's vital laboratory infrastructure and testing assets. Specifically, funds within this appropriation support security needs for the National Vehicle and Fuel Emissions Laboratory (NVFEL).

FY 2024 Activities and Performance Plan:

Work in this program directly supports Goal 6/Objective 6.3, Prepare for and Respond to Environmental Emergencies in the *FY 2022 - 2026 EPA Strategic Plan*.

In FY 2024, the Agency will continue to provide enhanced physical security for the NVFEL, its employees, visitors, and test articles, which include prototype vehicles and engines. This funding supports the cost of security enhancements required as part of an Agency security assessment review.

Performance Measure Targets:

EPA's FY 2024 Annual Performance Plan does not include annual performance goals specific to this program.

FY 2024 Change from FY 2023 Enacted Budget (Dollars in Thousands):

- (-\$124.0) This change to fixed and other costs is a decrease due to the recalculation of lab fixed costs.

Statutory Authority:

Intelligence Reform and Terrorism Prevention Act of 2004; Homeland Security Act of 2002; Reorganization Plan No. 3 of 1970, 84 Stat. 2086, as amended by Pub. L. 98–80, 97 Stat. 485 (codified at Title 5, App.) (EPA’s organic statute).

Indoor Air and Radiation

Indoor Air: Radon Program

Program Area: Indoor Air and Radiation

Goal: Ensure Clean and Healthy Air for All Communities

Objective(s): Reduce Exposure to Radiation and Improve Indoor Air

(Dollars in Thousands)

	FY 2022 Final Actuals	FY 2023 Enacted Operating Plan	FY 2024 President's Budget	FY 2024 President's Budget v. FY 2023 Enacted Operating Plan
Environmental Programs & Management	\$2,966	\$3,364	\$5,113	\$1,749
<i>Science & Technology</i>	<i>\$116</i>	<i>\$199</i>	<i>\$173</i>	<i>-\$26</i>
Total Budget Authority	\$3,082	\$3,563	\$5,286	\$1,723
Total Workyears	8.4	9.0	12.4	3.4

Program Project Description:

Title III of the Toxic Substances Control Act (TSCA) authorizes EPA to take a variety of actions to address the public health risks posed by exposures to indoor radon. Under the statute, EPA studies the health effects of radon, assesses exposure levels, sets an action level, provides technical assistance to states, industry, and the public, advises the public on steps they can take to reduce exposure and promotes the availability of reliable radon services and service providers to the public.

Radon is the second leading cause of lung cancer in the United States – and the leading cause of lung cancer mortality among non-smokers – accounting for about 21,000 deaths per year.⁴¹ EPA's non-regulatory Indoor Air: Radon Program promotes actions to reduce the public's health risk from indoor radon. EPA and the Surgeon General recommend that all homes be tested for radon and if radon levels above EPA's guidelines are confirmed, elevated levels should be reduced by home mitigation using proven, straightforward techniques. EPA also recommends that new homes be built using radon-resistant features in areas where there is elevated radon. Nationally, risks from radon have been reduced in many homes over the years, but millions of homes are still in need of mitigation. This voluntary program promotes partnerships between national organizations, the private sector, and more than 50 state, local, tribal and territory governmental programs to reduce radon risk.

These resources, combined with resources for the Indoor Air: Radon Program from the Environmental Programs and Management (EPM) account, supports the Radon Reference and Intercomparison Program (ERRIP) of the National Analytical Radiation Environmental Laboratory (NAREL) in Montgomery, Alabama. The ERRIP is the only federal National Institute of Standards and Technology (NIST) traceable primary radon reference and calibration program accessible to the U.S. radon industry and is a critical element of the framework for promoting the availability of reliable, quality radon services for the public.

⁴¹ <https://www.epa.gov/radon>.

FY 2024 Activities and Performance Plan:

Work in this program directly supports Goal 4/Objective 4.2, Reduce Exposure to Radiation and Improve Indoor Air in the *FY 2022 - 2026 EPA Strategic Plan*.

EPA will provide radon reference intercomparison samples to secondary radon chambers (known as ERRIP participants) operating in the United States to analyze. EPA then submits the radon reference data to the Radon Accrediting Board(s) to evaluate and assess the performance of the ERRIP participant. EPA will update and modernize program equipment and perform required QA/QC on program analytical process and procedures.

Performance Measure Targets:

(PM LCD) Number of lung cancer deaths prevented through lower radon exposure.

	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	Units
Target						1,881	1,981	2,083	Deaths
Actual	1,383	1,482	1,578	1,684	1,795	1,894			Prevented

FY 2024 Change from FY 2023 Enacted Budget (Dollars in Thousands):

- (+\$3.0) This change to fixed and other costs is an increase due to the recalculation of base workforce costs for existing FTE due to annual payroll increases, adjustments to provide essential workforce support, and changes to benefits costs.
- (-\$29.0) This program change decreases resources for radon reference intercomparison work.

Statutory Authority:

Title IV of the Superfund Amendments and Reauthorization Act (SARA); Title III Toxic Substances Control Act; Clean Air Act.

Radiation: Protection

Program Area: Indoor Air and Radiation

Goal: Ensure Clean and Healthy Air for All Communities

Objective(s): Reduce Exposure to Radiation and Improve Indoor Air

(Dollars in Thousands)

	FY 2022 Final Actuals	FY 2023 Enacted Operating Plan	FY 2024 President's Budget	FY 2024 President's Budget v. FY 2023 Enacted Operating Plan
Environmental Programs & Management	\$8,244	\$9,088	\$11,638	\$2,550
<i>Science & Technology</i>	<i>\$2,224</i>	<i>\$1,683</i>	<i>\$2,349</i>	<i>\$666</i>
Hazardous Substance Superfund	\$2,011	\$2,472	\$3,010	\$538
Total Budget Authority	\$12,479	\$13,243	\$16,997	\$3,754
Total Workyears	53.9	54.8	67.2	12.4

Program Project Description:

EPA supports contaminated site characterization and cleanup by providing field and fixed laboratory environmental, radiological, and radioanalytical data and technical support, providing radioanalytical training to state and federal partners, and developing new and improved radioanalytical methods. Many of the sites with radioactive contamination are surrounded by economically disadvantaged communities including, for example, tribal lands in the southwestern United States and former industrial sites located outside major urban areas.

In the event of a radiological accident or incident, the National Analytical Radiation Environmental Laboratory in Montgomery, Alabama, and the National Center for Radiation Field Operations in Las Vegas, Nevada, provide analytical and field operation support for radioanalytical testing, quality assurance, analysis of environmental samples, and field measurement systems and equipment to support site assessment, cleanup, and response activities. Together, these organizations provide technical support for conducting site-specific radiological characterizations and cleanups.

FY 2024 Activities and Performance Plan:

Work in this program directly supports Goal 4/Objective 4.2, Reduce Exposure to Radiation and Improve Indoor Air in the *FY 2022 - 2026 EPA Strategic Plan*.

In FY 2024, EPA, in cooperation with states, tribes, and other federal agencies, will provide ongoing site characterization and analytical support for site assessment activities, remediation technologies, and measurement and information systems. EPA also will provide essential training and direct site assistance, including field surveys and monitoring, laboratory analyses, health and safety, and risk assessment support at sites with radioactive contamination.

Performance Measure Targets:

EPA's FY 2024 Annual Performance Plan does not include annual performance goals specific to this program.

FY 2024 Change from FY 2023 Enacted Budget (Dollars in Thousands):

- (+\$31.0) This change to fixed and other costs is an increase due to the recalculation of base workforce costs for existing FTE due to annual payroll increases, adjustments to provide essential workforce support, and changes to benefits costs.
- (+\$39.0) This change to fixed and other costs is an increase due to the recalculation of lab utilities.
- (+\$596.0 / +2.2 FTE) This program change is an increase that supports addressing critical gaps in EPA's radiological protection capacity including the ability to provide ongoing site characterization and analytical support for site assessment activities, radioactive waste storage and disposal approaches, remediation technologies, and measurement and information systems. This investment includes \$401.0 thousand in payroll.

Statutory Authority:

Atomic Energy Act of 1954; Clean Air Act; Energy Policy Act of 1992; Nuclear Waste Policy Act of 1982; Public Health Service Act; Safe Drinking Water Act; Uranium Mill Tailings Radiation Control Act (UMTRCA) of 1978; Waste Isolation Pilot Plant Land Withdrawal Act of 1992; Marine Protection, Research, and Sanctuaries Act; Clean Water Act.

Radiation: Response Preparedness

Program Area: Indoor Air and Radiation

Goal: Ensure Clean and Healthy Air for All Communities

Objective(s): Reduce Exposure to Radiation and Improve Indoor Air

(Dollars in Thousands)

	FY 2022 Final Actuals	FY 2023 Enacted Operating Plan	FY 2024 President's Budget	FY 2024 President's Budget v. FY 2023 Enacted Operating Plan
Environmental Programs & Management	\$2,658	\$2,650	\$3,143	\$493
<i>Science & Technology</i>	<i>\$2,928</i>	<i>\$3,596</i>	<i>\$4,686</i>	<i>\$1,090</i>
Total Budget Authority	\$5,586	\$6,246	\$7,829	\$1,583
Total Workyears	31.0	33.3	41.4	8.1

Program Project Description:

The National Analytical Radiation Environmental Laboratory (NAREL) in Montgomery, Alabama, and the National Center for Radiation Field Operations (NCRFO) in Las Vegas, Nevada, provide field sampling and laboratory analyses to respond to radiological and nuclear incidents. This work includes measuring and monitoring radioactive materials and assessing radioactive contamination in the environment. This program comprises direct scientific field and laboratory activities to support preparedness, planning, training, and procedure development. In addition, program personnel are members of EPA's Radiological Emergency Response Team (RERT), a component of the Agency's emergency response program, and are trained to provide direct expert scientific and technical assistance. EPA's RERT is part of the Nuclear Incident Response Team under the Department of Homeland Security.

FY 2024 Activities and Performance Plan:

Work in this program directly supports Goal 4/Objective 4.2, Reduce Exposure to Radiation and Improve Indoor Air in the *FY 2022 - 2026 EPA Strategic Plan*.

In FY 2024, EPA's RERT will provide critical support for federal radiological emergency response and recovery operations under the National Response Framework and the National Oil and Hazardous Substances Pollution Contingency Plan. When necessary, EPA's RERT will complement routine operations (e.g., on-site technical support/consultation and laboratory analyses) and provide for the rapid collection of field measurements/samples and accurate radionuclide analyses of environmental samples.⁴²

In FY 2024, NAREL and NCRFO will build capacity in core levels of readiness for radiological emergency responses; participate in critical emergency exercises; and respond, as required, to radiological incidents. NAREL and NCRFO will prioritize rapid deployment capabilities to ensure that field teams and laboratory personnel are ready to provide scientific data, field measurement

⁴² For additional information, please visit: <https://www.epa.gov/radiation/radiological-emergency-response>.

capabilities, analyses, and updated analytical techniques for radiation emergency response programs across the Agency.

Performance Measure Targets:

(PM RAD2) Percentage of radiation emergency response program personnel and assets that meet functional readiness requirements necessary to support federal radiological emergency response and recovery operation.

	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	Units
Target						90	92	92	Percent
Actual					92	88			
Numerator					128.24	122.78			Personnel and Assets
Denominator					140	140			

FY 2024 Change from FY 2023 Enacted Budget (Dollars in Thousands):

- (-\$196.0) This change to fixed and other costs is a decrease due to the recalculation of base workforce costs for existing FTE due to annual payroll increases, adjustments to provide essential workforce support, and changes to benefits costs.
- (+\$124.0) This change to fixed and other costs is an increase due to the recalculation of lab utilities.
- (+\$1,162.0 / +5.0 FTE) This program change is an increase to support activities for preparedness work, including basic laboratory analytic functions and field operations. This investment includes \$806.0 thousand in payroll.

Statutory Authority:

Homeland Security Act of 2002; Atomic Energy Act of 1954; Clean Air Act; Post-Katrina Emergency Management Reform Act of 2006 (PKEMRA); Public Health Service Act (PHSA); Robert T. Stafford Disaster Relief and Emergency Assistance Act; Safe Drinking Water Act (SDWA).

Reduce Risks from Indoor Air

Program Area: Indoor Air and Radiation

Goal: Ensure Clean and Healthy Air for All Communities

Objective(s): Reduce Exposure to Radiation and Improve Indoor Air

(Dollars in Thousands)

	FY 2022 Final Actuals	FY 2023 Enacted Operating Plan	FY 2024 President's Budget	FY 2024 President's Budget v. FY 2023 Enacted Operating Plan
Environmental Programs & Management	\$12,611	\$13,593	\$47,389	\$33,796
<i>Science & Technology</i>	<i>\$136</i>	<i>\$278</i>	<i>\$183</i>	<i>-\$95</i>
Total Budget Authority	\$12,748	\$13,871	\$47,572	\$33,701
Total Workyears	40.1	39.2	71.4	32.2

Program Project Description:

Title IV of the Superfund Amendments and Reauthorization Act of 1986 (SARA) authorizes EPA to conduct and coordinate research on indoor air quality, develop and disseminate information, and coordinate risk reduction efforts at the federal, state, tribal and local levels. Poor indoor air quality represents one of the most significant public health risks within EPA's responsibility.⁴³ EPA uses a range of strategies to reduce health risks from poor indoor air quality in homes, schools, and other buildings through partnerships with non-governmental, professional, federal, state, and local organizations. Through these partnerships EPA provides information, guidance, and technical assistance to equip industry, the health care community, the residential, school, and commercial building sectors, and the general public to take action. As technical experts working at the intersection of the built environment and health, EPA is focused on policy and guidance to improve building conditions, including for disproportionately impacted communities, to reduce indoor air risk and achieve improvements in environmental and health outcomes.

Tribes have identified indoor air quality as a high priority and often bear disproportionately high impacts from poor indoor air quality. For example, Native Americans and Alaska Natives disproportionately suffer from asthma, in part due to poor housing conditions and the associated increase in exposure to indoor air pollutants.

FY 2024 Activities and Performance Plan:

Work in this program directly supports Goal 4/Objective 4.2, Reduce Exposure to Radiation and Improve Indoor Air in the *FY 2022 - 2026 EPA Strategic Plan*.

This request, combined with resources for Reduce Risks from Indoor Air from the Environmental Programs and Management (EPM) account, will enable EPA to continue monitoring, assessing, and assisting communities in reducing risks from poor indoor air quality. Under this program, EPA will maintain indoor air monitoring and assessment equipment, conduct field measurements and

⁴³ <https://www.epa.gov/iaq>.

assessments, and provide technical support and guidance for indoor air quality remediations, with a primary focus on assistance to tribal communities. In addition, EPA will conduct training and capacity building for tribal air quality professionals on indoor air assessments and field measurement technology and practices, including radon.

Performance Targets:

EPA's FY 2024 Annual Performance Plan does not include annual performance goals specific to this program.

FY 2024 Change from FY 2023 Enacted Budget (Dollars in Thousands):

- (-\$8.0) This net change to fixed and other costs is a decrease due to the recalculation of base workforce costs for existing FTE due to annual payroll increases, adjustments to provide essential workforce support, and changes to benefits costs.
- (-\$87.0) This program change decreases resources for activities that reduce risk from indoor air quality, such as conducting field measurements and assessments and providing technical support and guidance.

Statutory Authority:

Title IV SARA; Title III Toxic Substances Control Act; Clean Air Act.

IT / Data Management

Program Area: IT / Data Management / Security
Cross-Agency Mission and Science Support

(Dollars in Thousands)

	FY 2022 Final Actuals	FY 2023 Enacted Operating Plan	FY 2024 President's Budget	FY 2024 President's Budget v. FY 2023 Enacted Operating Plan
Environmental Programs & Management	\$90,029	\$91,821	\$105,868	\$14,047
<i>Science & Technology</i>	<i>\$2,799</i>	<i>\$3,197</i>	<i>\$3,313</i>	<i>\$116</i>
Hazardous Substance Superfund	\$16,075	\$19,764	\$17,727	-\$2,037
Total Budget Authority	\$108,903	\$114,782	\$126,908	\$12,126
Total Workyears	463.6	490.9	503.9	13.0

Total work years in FY 2024 include 172.0 FTE to support IT/Data Management working capital fund (WCF) services.

Program Project Description:

The work performed under the Information Technology/Data Management (IT/DM) Program supports human health and the environment by providing critical IT infrastructure and data management. Science and Technology (S&T) resources for EPA's IT/DM Program fund the following activities: Quality Program,⁴⁴ EPA National Library Network, and Web Infrastructure Management.

The Quality Program provides quality policy, procedures, standards, and guidance for environmental information collection, production, evaluation, and use activities. These activities are performed by or for the Agency to ensure sound decisions are based on quality to support their intended use as we strive to protect human health and the environment. The Quality Program provides Quality Assurance (QA) directives, training, oversight, and technical support to assist EPA organizations in implementing their Quality Program for environmental information operations. It also oversees the implementation of EPA's Information Quality Guidelines (IQGs).

EPA's National Library Network provides information resources and services to EPA staff and the public in support of EPA's mission. Web Infrastructure Management provides accessible, relevant, timely, accurate, and complete environmental information to EPA's employees, partners, and stakeholders, as well as the public, through the websites and digital services which constitute EPA's internet presence.

FY 2024 Activities and Performance Plan:

Work in this program provides Cross-Agency Mission and Science Support and is allocated across strategic goals and objectives in the *FY 2022 - 2026 EPA Strategic Plan*.

⁴⁴ For more information about EPA's Quality Program, please see: <http://www.epa.gov/quality>.

EPA's Quality Program provides implementation support to all EPA organizations that have environmental information operations described in an approved Quality Management Plan (QMP). In FY 2024, the Quality Program will:

- Assess organizations that have an approved QMP and identify findings requiring corrective action, areas needing improvement, and leveraging best practices.
- Focus on promoting sound science and ensure scientific integrity by promoting better planning to produce improved environmental information. Evaluate environmental information through use of the QA Annual Report and Work Plan and annual certification by Assistant and Regional Administrators.
- Manage and provide oversight for the IQGs to ensure that information disseminated by or for EPA conforms with the *Guidelines for Ensuring and Maximizing the Quality, Objectivity, Utility and Integrity of Information Disseminated by the Environmental Protection Agency* criteria.⁴⁵ The Quality Program will facilitate the development of the Agency's responses to public requests for correction and reconsideration of information disseminated by EPA and report this information to the Office of Management and Budget (OMB). The Quality Program also will continue to focus on implementing recommendations from the Office of Inspector General (OIG) Audit Report, *EPA Needs to Address Internal Control Deficiencies in the Agencywide Quality System*.⁴⁶ The Program will give priority to implementation of revised Quality Directives for QMPs and Quality Assurance Project Plans, and the IQGs.
- Engage as a resource with EPA's state and tribal partners and environmental justice communities and support the Climate Change Program to ensure QA processes and procedures are in place to protect human health and the environment.

The Agency's S&T resources for IT/DM also will help provide library services through the EPA National Library Network to all EPA employees and environmental information access to the public, as well as support the hosting of EPA's websites and web pages. One EPA Web will continue to manage content and support internal and external users with information on EPA business, support employees with internal information, and provide a clearinghouse for the Agency to communicate initiatives and successes.

In FY 2024, EPA will work to transform the Agency's libraries to meet the needs of the 21st Century. This involves operating in an increasingly online and mobile environment; providing services and resources at the customer's point of need; prioritizing the thorough assessment of print materials to support strategic space usage; utilizing detailed data to ensure print collections are highly relevant to the Agency's needs and centralizing core services; and relying on technology and a team of professional librarians to disseminate information and connect people to resources they need to support the demands of both internal and external requests.

⁴⁵ For more information, please see: <https://www.epa.gov/quality/guidelines-ensuring-and-maximizing-quality-objectivity-utility-and-integrity-information>.

⁴⁶ For more information, please see: <https://www.epa.gov/office-inspector-general/report-epa-needs-address-internal-control-deficiencies-agencywide-quality>.

Performance Measure Targets:

EPA's FY 2024 Annual Performance Plan does not include annual performance goals specific to this program.

FY 2024 Change from FY 2023 Enacted Budget (Dollars in Thousands):

- (+\$116.0) This net change to fixed and other costs is an increase due to the recalculation of base workforce costs for existing FTE due to annual payroll increases, adjustments to provide essential workforce support, and changes to benefits costs.

Statutory Authority:

Reorganization Plan No. 3 of 1970, 84 Stat. 2086, as amended by Pub. L. 98–80, 97 Stat. 485 (codified at Title 5, App.) (EPA's organic statute); Federal Information Technology Acquisition Reform Act; Federal Information Security Modernization Act (FISMA); Government Performance and Results Act (GPRA); Government Management Reform Act (GMRA); Clinger-Cohen Act (CCA); Rehabilitation Act of 1973 § 508.

Operations and Administration

Facilities Infrastructure and Operations

Program Area: Operations and Administration

Cross-Agency Mission and Science Support

(Dollars in Thousands)

	FY 2022 Final Actuals	FY 2023 Enacted Operating Plan	FY 2024 President's Budget	FY 2024 President's Budget v. FY 2023 Enacted Operating Plan
Environmental Programs & Management	\$291,501	\$283,330	\$305,753	\$22,423
<i>Science & Technology</i>	<i>\$68,347</i>	<i>\$67,500</i>	<i>\$72,043</i>	<i>\$4,543</i>
Building and Facilities	\$24,681	\$42,076	\$105,009	\$62,933
Leaking Underground Storage Tanks	\$922	\$754	\$727	-\$27
Inland Oil Spill Programs	\$854	\$682	\$641	-\$41
Hazardous Substance Superfund	\$76,108	\$65,634	\$71,540	\$5,906
Total Budget Authority	\$462,412	\$459,976	\$555,713	\$95,737
Total Workyears	310.6	321.8	330.4	8.6

Total work years in FY 2024 include 5.4 FTE to support Facilities Infrastructure and Operations working capital fund (WCF) services.

Program Project Description:

Science and Technology (S&T) resources in the Facilities Infrastructure and Operations Program fund the Agency's rent, utilities, and security. The Program also supports centralized administrative activities and support services, including health and safety, environmental compliance and management, facilities maintenance and operations, space planning, sustainable facilities and energy conservation planning and support, property management, mail, and transportation services. Funding for such services is allocated among the major appropriations for the Agency.

FY 2024 Activities and Performance Plan:

Work in this program provides Cross-Agency Mission and Science Support and is allocated across strategic goals and objectives in the *FY 2022 - 2026 EPA Strategic Plan*.

In FY 2024, the Agency will continue to pursue agencywide climate sustainability and resiliency initiatives and EPA facilities projects. Investing in the reconfiguration of EPA's workspaces enables the Agency to release office space and avoid long-term rent costs, consistent with HR 4465, the *Federal Assets Sale and Transfer Act of 2016*.⁴⁷ EPA is implementing a long-term space consolidation plan that aims to reduce the number of occupied facilities, consolidate, and optimize space within remaining facilities, and reduce square footage wherever practical. The Agency's space consolidation efforts are expected to result in cost avoidances due to projected rent increases over ten years. EPA also will continue working to enhance its federal infrastructure and operations

⁴⁷ For additional information, please refer to: <https://www.congress.gov/bill/114th-congress/house-bill/4465>, *Federal Assets Sale and Transfer Act of 2016*.

in a manner that increases efficiency. These enhancements also support the Future of Work as the Agency continues to implement hybrid, remote, and physical workspaces, consistent with OMB Memorandum M-21-25.⁴⁸ For FY 2024, the Agency is requesting \$29.12 million for rent, \$17.66 million for utilities, and \$11.91 million for security in the S&T appropriation. EPA uses a standard methodology to ensure that rent charging appropriately reflects planned and enacted resources at the appropriation level.

EPA also will work to secure physical and operational resiliency for agency facilities. As part of this work, EPA will continue conducting climate resiliency assessments at all EPA-owned facilities to identify critical upgrades that are necessary to improve facility resiliency against the impacts of climate change, such as roofing stability or seawall construction projects. In FY 2024, EPA will conduct climate assessments at the following facilities: Office of Air and Radiation Laboratory – Montgomery; Edison Environmental Center; Region 4 Field Annex – Athens; Athens Environmental Center; Corvallis Environmental Laboratory; and Newport Environmental Laboratory. EPA will initiate all high-priority projects within 24 months of the completion of a climate assessment.

Further, EPA will continue reconfiguring EPA’s workplaces with the goal of reducing long-term rent costs while increasing EPA facility sustainability to combat the effects of climate change and ensuring a space footprint that accommodates a growing workforce.⁴⁹ Space reconfiguration enables EPA to reduce its footprint to create a more efficient, collaborative, and technologically sophisticated workplace. However, even if modifications are kept to a minimum, each move requires initial funding to achieve long-term cost avoidance and sustainability goals. These investments support sustainable federal infrastructure, a clean energy future, and goals to achieve net-zero emissions by 2050.

In FY 2024, EPA will pursue aggressive energy, water, and building infrastructure requirements with emphasis on environmental programs (*e.g.*, Environmental Management Systems, Environmental Compliance Programs, Leadership in Energy and Environmental Design Certification, alternative fuel use, fleet reductions, telematics, sustainability assessments). This investment in infrastructure (*e.g.*, architectural and design) and mechanical systems (*e.g.*, Optimized Building Managements Systems for heating and cooling with load demand driven controls) is necessary to meet the Administration’s climate sustainability goals. Additionally, in FY 2024, EPA will continue the Agency’s transition to electric vehicles through direct purchase (mobile lab vehicles) or lease through the General Services Administration (GSA) for all future fleet procurements where economically feasible. EPA also will identify opportunities to build out necessary charging infrastructure at EPA facility locations. In line with federal sustainability goals, EPA will work to utilize 100 percent carbon pollution-free electricity on a net annual basis by 2030.

⁴⁸ For additional information, please refer to: <https://www.whitehouse.gov/wp-content/uploads/2021/06/M-21-25.pdf>.

⁴⁹ Work in this program takes direction for climate change and sustainability related initiatives from the following: EO 14008: *Tackling the Climate Crisis at Home and Abroad* (<https://www.whitehouse.gov/briefing-room/presidential-actions/2021/01/27/executive-order-on-tackling-the-climate-crisis-at-home-and-abroad/>). EO 14057: *Catalyzing Clean Energy Industries and Jobs Through Federal Sustainability* (<https://www.whitehouse.gov/briefing-room/presidential-actions/2021/12/08/executive-order-on-catalyzing-clean-energy-industries-and-jobs-through-federal-sustainability/>).

EPA also will meet regulatory Occupational Safety and Health Administration (OSHA) obligations and provide health and safety training to field staff (*e.g.*, inspections, monitoring, on-scene Coordinators), and track capital equipment of \$25 thousand or more. The Agency will continue its partnership with GSA to utilize shared services solutions, *USAccess*, and Enterprise Physical Access Control System (ePACS) programs. *USAccess* provides standardized Homeland Security Presidential Directive, HSPD-12, approved Personal Identity Verification (PIV) card enrollment and issuance and ePACS provides centralized access control of EPA space, including restricted and secure areas.

Performance Measure Targets:

Work under this program supports performance results in the Facilities Infrastructure and Operations Program under the EPM appropriation.

FY 2024 Change from FY 2023 Enacted Budget (Dollars in Thousands):

- (-\$368.0) This net change to fixed and other costs is a decrease due to adjustments for rent, utilities, security, and transit subsidy needs.
- (+\$4,911.0) This program change supports implementation of EO 14057: *Catalyzing Clean Energy Industries and Jobs Through Federal Sustainability* requirements that will require EPA to increase facility resiliency against the impact of climate change and to advance sustainability of EPA operations. This investment increases support for EPA facilities projects to ensure EPA has optimal footprint to support the proposed FTE increase in the FY 2024 Budget request, continue ongoing EPA laboratory consolidation projects, and support agencywide climate sustainability and resiliency initiatives such as facility climate assessments and Optimized Building Managements Systems.

Statutory Authority:

Federal Property and Administration Services Act; Reorganization Plan No. 3 of 1970, 84 Stat. 2086, as amended by Pub. L. 98-80, 97 Stat. 485 (codified at Title 5, App.) (EPA's organic statute).

Pesticides Licensing

Pesticides: Protect Human Health from Pesticide Risk

Program Area: Pesticides Licensing

Goal: Ensure Safety of Chemicals for People and the Environment

Objective(s): Ensure Chemical and Pesticide Safety

(Dollars in Thousands)

	FY 2022 Final Actuals	FY 2023 Enacted Operating Plan	FY 2024 President's Budget	FY 2024 President's Budget v. FY 2023 Enacted Operating Plan
Environmental Programs & Management	\$65,333	\$62,125	\$65,529	\$3,404
<i>Science & Technology</i>	<i>\$2,854</i>	<i>\$2,894</i>	<i>\$4,031</i>	<i>\$1,137</i>
Total Budget Authority	\$68,187	\$65,019	\$69,560	\$4,541
Total Workyears	420.3	385.6	385.6	0.0

Total program work years in FY 2024 include 82.1 FTE funded by the Reregistration and Expedited Processing Revolving Fund.

Program Project Description:

EPA's Pesticide Programs screen new pesticides before they reach the market and ensure that pesticides already in commerce are safe. As directed by the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), the Federal Food, Drug, and Cosmetic Act (FFDCA), as amended by the Food Quality Protection Act of 1996 (FQPA), and the Pesticide Registration Improvement Act of 2022 (PRIA 5),⁵⁰ EPA is responsible for registering and re-evaluating pesticides to protect consumers, pesticide users, workers who may be exposed to pesticides, children, and other sensitive populations.

To make regulatory decisions and establish tolerances (*e.g.*, maximum allowable pesticide residues on food and feed) for food use pesticides and for residential or non-occupational use, EPA must find the pesticide safe. This involves considering cumulative and aggregate risks and ensuring extra protection for children as required by the FQPA. Aggregate assessments ensure that there is reasonable certainty that no harm will result from aggregate exposure to the pesticide chemical residue, including all anticipated dietary exposure and all other exposure for which there is reliable information. For cumulative assessments, the Agency is required to consider available information concerning the cumulative effects of such residues and other substances that have a common mechanism of toxicity. The Agency must balance the risks and benefits of other uses. For antimicrobial pesticides with public health claims, EPA requires that manufacturers perform tests to ensure the efficacy (*i.e.*, performance) of products per the labelling. In anticipation of future public health emergencies, the Pesticide Program evaluates public health claims for antimicrobial products, including the accelerated availability of disinfectants determined to be effective against emerging pathogens and development of study designs to support the generation of innovative products, including those that can reduce airborne transmission of these pathogens. This program

⁵⁰ On December 29, 2022, the Pesticide Registration Improvement Extension Act of 2022 (PRIA 5), which reauthorizes PRIA for 5 years through fiscal year 2027 and updates the fee collection provisions of the FIFRA, was signed into law.

operates two laboratories, the Microbiology Laboratory⁵¹ and the Analytical Chemistry Laboratory.⁵²

FY 2024 Activities and Performance Plan:

Work in this program directly supports Goal 7/Objective 7.1, Ensure Chemical and Pesticide Safety in the *FY 2022 – 2026 EPA Strategic Plan*.

The Analytical Chemistry Laboratory will continue to develop and validate methods for multi-residue pesticide analyses, including furthering test protocols, providing technical review of data and reports. The laboratory will also provide technical analyses and support to states, EPA Regions and the Office of Enforcement and Compliance Assurance (OECA) in enforcement cases related to the potential misuse of or illegal pesticides. Additionally, this lab maintains EPA's National Pesticide Standard Repository and distributes more than 5,000 standards yearly to States and Regions for use in validating test results, calibrating instruments, and/or for identifying and quantifying pesticide residues. In addition, the laboratory will continue to provide technical support to EPA's Office of Pesticide Programs to develop and standardize test protocols relating to the performance of portable monitoring devices measuring post-application levels. Finally, work will continue the development and release of additional testing methods related to identifying and quantifying PFAS residues in High Density Polyethylene (HDPE) containers. These efforts are critical to ensuring the safety of pesticide products within channels of trade, including those available for use by the public.

The Microbiology Laboratory will continue to protect human health by ensuring the availability of scientifically sound efficacy test methods for antimicrobial pesticides (*e.g.*, hospital disinfectants used to treat surfaces). By developing new methods for new uses and emerging pathogens, the regulated community can register new products as well as new claims for existing products. These efforts will benefit the public because of the critical support the Laboratory provides to inform regulatory actions for public health pesticides, identify pathways for approval of pathogen-specific claims, and allow for marketplace penetration of these products.

Specifically, in FY 2024, the Microbiology Laboratory will:

- Continue to work on the data collection, analysis, and development of new regulatory guidance and implementation materials on a quantitative method for bactericidal claims to support adoption of the method for regulatory purposes.
- Complete analysis of FY 2021-2022 multi-laboratory data and develop guidance materials and final method (including submission to and review by ASTM subcommittee) for *Legionella* in recirculating water for cooling tower remediation.
- Provide efficacy testing and technical support for workplans for the Antimicrobial Product Evaluation Program (APEP) pursuant to EPA's response to the Office of the Inspector General (Report No. 16-P-0316).⁵³

⁵¹ For additional information, please visit: <https://www.epa.gov/aboutepa/about-microbiology-laboratory>.

⁵² For additional information, please visit: <https://www.epa.gov/aboutepa/about-analytical-chemistry-laboratory-acl>.

⁵³ *See*, Report No. 16-P-0316, "Report: EPA Needs a Risk-Based Strategy to Assure Continued Effectiveness of Hospital-Level Disinfectants," found at: <https://www.epa.gov/office-inspector-general/report-epa-needs-risk-based-strategy-assure-continued-effectiveness>.

- Continue to revise the existing residual self-sanitizing disinfectant protocol and collect data to support the revisions and submit the method for comment and/or through ASTM.
- Continue to pursue the development of a regulatory guidance document and implementation strategy for evaluating the efficacy of antimicrobial towelettes.
- Continue to develop laboratory capacity for conducting efficacy testing with Biosafety Level 3 (BSL-3) microorganisms at the Environmental Science Center in Ft. Meade, Maryland. EPA's Pesticide Program has the only EPA laboratory with physical containment laboratories to manage BSL-3 microbes.
- Continue to expand viral testing and method development to respond to emerging viral pathogens.
- Continue work to finalize the guidance for efficacy claims on porous materials by responding to public comment on the draft guidance and proposing a final document for release in FY 2024.

In FY 2024, the Analytical Chemistry Laboratory will continue to protect human health by ensuring the availability of appropriate analytical methods for analyzing pesticide residues in food and feed and ensuring their suitability for monitoring pesticide residues and enforcing tolerances. In addition, the Laboratory will:

- Develop improved analytical methods and protocols using state of the art instruments to replace outdated ones, thus increasing laboratory efficiency and accuracy of the data.
- Continue to develop new methods to support EPA's overall efforts on identifying PFAS compounds and potential routes of exposure. Additional methods specific to types of pesticide formulations will continue to progress, including finalizing methods to quantify PFAS in High Density Polyethylene (HDPE) containers and methodology to quantify residues in pesticide formulations of varying chemistries (i.e., those containing surfactants).
- Provide analytical support to fill in data gaps for the Pesticide Programs' Section 18 emergency exemption applications, and to perform studies for use in risk assessments and ultimately, risk mitigation decisions.
- Provide analytical assistance and technical advice to the EPA Office of Enforcement and Compliance Assurance (OECA) and to all regional offices in support of their enforcement cases, including cases against domestic and especially imported disinfectant products with false label claims. This could disproportionately impact members of communities with environmental justice (EJ) concerns who might not speak English, who may be targeted by illegal imports, and who may not know how to look for approved products (*i.e.*, List N products).
- Verify that pesticides products are properly formulated.
- Operate EPA's National Pesticide Standard Repository.⁵⁴

Preventing Disease through Public Health Pesticides: Antimicrobial Testing

EPA's Antimicrobial Testing Program (ATP), starting in 1991, was charged with testing hospital sterilants, disinfectants, and tuberculocides since 1991 to help ensure that products in the marketplace meet stringent efficacy standards. EPA is in the process of developing a new risk-

⁵⁴ For additional information, please visit: <https://www.epa.gov/pesticide-analytical-methods/national-pesticide-standard-repository>.

based testing strategy in response to OIG recommendations.⁵⁵ Consistent with the OIG recommendations, EPA suspended the ATP in November 2017. EPA released a draft risk-based strategy, renamed the Antimicrobial Performance Evaluation Program (APEP), in October 2019 for public comment and will continue to seek public input prior to implementation as early as FY 2024. Implementation of the APEP will benefit public health by ensuring approved antimicrobials meet contemporary efficacy standards.

The Microbiology Laboratory will continue to develop efficacy methods to support EPA's antimicrobial pesticide regulatory programs. The results of these efforts will help ensure products are available to control various bacteria (e.g., *Clostridioides difficile*), viruses (e.g., Mpox (formerly monkeypox) and other emerging pathogens) and biofilms and to inform EPA's method development activities in FY 2024 and beyond.

This FY 2024 request includes an increase of \$1.2 million to invest in a Biosafety Level 3 Lab at Fort Meade, MD, the only such lab at EPA. These funds are needed to replace some aging critical lab equipment and modernize the lab's capabilities to be responsive to homeland security & other emerging issues (i.e. - such as pandemics). The additional funding will support the following critical lab purchases:

- Update and/or purchase equipment to meet more current laboratory specifications for a biosafety level 3 (BSL-3).
- Conversion of current steam sterilizer (autoclave) in B202 (Federal Select Agent registered lab) to a pass-through autoclave.
- Replace autoclave in B207 (BSL-3 virus lab) with a new pass-through autoclave since both laboratory branches are currently covered under the existing environmental monitoring system contract.
- Modernization of IT in BSL-3 laboratory (LAN, scanner, tablets/software for paperless recordkeeping, etc.)
- Pass-through port for both BSL-3 laboratories (e.g., <https://www.enviropass.com/products/medical-pass-throughs/specimen-pass-through/>).
- Enlargement of BSL-3 anterooms to provide additional safety measures.
- Dedicated shower-out capability in the lab wing.

Performance Measure Targets:

Work under this program supports performance results in the Pesticides: Protect Human Health from Pesticide Risk Program under the EPM appropriation.

FY 2024 Change from FY 2023 Enacted Budget (Dollars in Thousands):

- (+\$36.0) This change to fixed and other costs is an increase due to the recalculation of base workforce costs for existing FTE due to annual payroll increases, adjustments to provide essential workforce support, and changes to benefits costs.

⁵⁵ For additional information, please visit: <https://www.epa.gov/pesticide-registration/antimicrobial-performance-evaluation-program-apep>.

- (-\$85.0) This change to fixed and other costs is a decrease due to the recalculation of laboratory fixed costs.
- (+\$1,186.0) This increase provides \$1.186 million to invest in a Biosafety Level 3 Lab at Fort Meade, MD. These funds are needed to replace aging critical lab equipment and modernize the lab's capabilities to be responsive to emerging issues such as pandemics.

Statutory Authority:

Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA); Federal Food, Drug, and Cosmetic Act (FFDCA), §408.

Pesticides: Protect the Environment from Pesticide Risk

Program Area: Pesticides Licensing

Goal: Ensure Safety of Chemicals for People and the Environment

Objective(s): Ensure Chemical and Pesticide Safety

(Dollars in Thousands)

	FY 2022 Final Actuals	FY 2023 Enacted Operating Plan	FY 2024 President's Budget	FY 2024 President's Budget v. FY 2023 Enacted Operating Plan
Environmental Programs & Management	\$43,688	\$48,704	\$75,391	\$26,687
Science & Technology	\$2,487	\$2,334	\$2,339	\$5
Total Budget Authority	\$46,175	\$51,038	\$77,730	\$26,692
Total Workyears	312.7	259.6	282.1	22.5

Total program work years in FY 2024 include 53.2 FTE funded by the Reregistration and Expedited Processing Revolving Fund.

Program Project Description:

EPA's Pesticide Program screens new pesticides before they reach the market and ensures that pesticides already in commerce are safe. As directed by the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), the Federal Food, Drug, and Cosmetic Act (FFDCA), as amended by the Food Quality Protection Act of 1996 (FQPA), and the Pesticide Registration Improvement Act of 2022 (PRIA 5),⁵⁶ EPA is responsible for registering and re-evaluating pesticides to protect humans, plants, animals, and ecosystems that are not targets of the pesticide.

Under FIFRA, the Agency must balance the risks and benefits of other pesticide uses. For antimicrobial pesticides with public health claims, EPA requires that manufacturers perform tests to ensure the efficacy (*i.e.*, performance) of products per the labelling.

In addition to FIFRA responsibilities, the Agency has responsibilities under the Endangered Species Act (ESA).⁵⁷ Under ESA, EPA must ensure that pesticide regulatory decisions will not destroy or adversely modify designated critical habitat or result in jeopardy to the continued existence of species listed by the U.S. Fish and Wildlife Service (FWS) or the National Marine Fisheries Service (NMFS). Where risks are identified, EPA must work with FWS and NMFS in a consultation process to ensure these pesticide registrations also will meet the ESA standard.

Under the Science and Technology appropriation, EPA's Pesticide Program operates two laboratories, the Microbiology Laboratory⁵⁸ and the Analytical Chemistry Laboratory,⁵⁹ that support the goal of protecting human health and the environment through diverse analytical testing and analytical method development and validation efforts. These laboratories provide a variety of

⁵⁶ On December 19, 2022, the Pesticide Registration Improvement Extension Act of 2022 (PRIA 5), which reauthorizes PRIA for 5 years through fiscal year 2027 and updates the fee collection provisions of the FIFRA was signed into law.

⁵⁷ *See*, ESA sections 7(a)(1) and 7(a)(2); Federal Agency Actions and Consultations (16 U.S.C. § 1536(a)), available at the U.S. Fish and Wildlife Service ESA internet site: <https://www.fws.gov/service/section-7-consultations>.

⁵⁸ For additional information, please visit: <https://www.epa.gov/aboutepa/about-microbiology-laboratory>.

⁵⁹ For additional information, please visit: <https://www.epa.gov/aboutepa/about-analytical-chemistry-laboratory-acl>.

technical services to EPA, other federal and state agencies, tribal nations, and other organizations to ensure the protection of the environment from pesticide risk.

EPA's Pesticide Program laboratories provide a diverse range of environmental data that the Agency uses to make informed regulatory decisions. The Analytical Chemistry Laboratory and the Microbiology Laboratory each provide critical laboratory testing and support activities to assist the decision-making processes of the Agency. The laboratories develop standard methods to evaluate the performance of antimicrobial products such as disinfectants used in hospital settings, and validate analytical chemistry methods to ensure that EPA, the Food and Drug Administration (FDA), the United States Department of Agriculture (USDA), and the states have reliable methods to measure and monitor pesticide residues in food and the environment.

FY 2024 Activities and Performance Plan:

Work in this program directly supports Goal 7/Objective 7.1, Ensure Chemical and Pesticide Safety in the *FY 2022 – 2026 EPA Strategic Plan*.

Laboratory activities in FY 2024 will include continuing to lead collaborative studies with other laboratories to validate testing methods for antimicrobial products to determine their efficacy against pathogens such as *Legionella*; working with the Antimicrobials Division on the implementation of an appropriate performance standard for a revised method for measuring the efficacy of disinfectants quantitatively; working with state laboratories to share method development and analyze samples, as requested; and working with investigations to evaluate the composition of potentially illegal pesticides.

In FY 2024, the Microbiology Laboratory will continue to work with the U.S. Department of Homeland Security and USDA to evaluate various environmentally relevant materials such as porous materials (*e.g.*, wood, concrete, fabric, tile, etc.) which simulate use sites in livestock, poultry, and other food animal rearing operations. Outbreaks of avian influenza, African swine fever, Newcastle Disease virus, and other pathogens can devastate American agriculture, and the persistence of these viruses on surfaces is not well understood. Currently, due to the unavailability of standardized quantitative test methods to simulate real-world conditions, the response to an animal pathogen outbreak and submission of requests under FIFRA Section 18 to address these outbreaks rely on published, often antiquated, data. Thus, the use of commonly available chemicals for remediation (*e.g.*, citric acid, sodium hypochlorite, chlorine dioxide, etc.) of contaminated sites without extensive knowledge of their environmental impact from such widespread use is problematic.

The goal of the Microbiology Laboratory is to develop a quantitative approach for assessing the effectiveness of antimicrobial products against high consequence animal viruses and other pathogens. Through this approach, EPA will provide a tool for the development of high-quality efficacy data on relevant surface materials. The availability of the method to the regulated community will support the development of new antimicrobial products following contemporary regulatory requirements.

In FY 2024, the Analytical Chemistry Laboratory will continue to focus on analytical method development and validations as well as special studies to address specific, short-term, rapid-turnaround priority issues. Specifically, the development and release of new methods for the analysis of PFAS in formulated pesticide products containing surfactants and a second method for quantifying the amounts of PFAS in container walls. These methods, once validated, will provide standardized, critical tools for the analysis of pesticide residues for PFAS, supporting the first portion of EPA's strategic plan to effectively identify these compounds and potential routes of exposure. Additionally, this lab will continue to support registration review efforts related to testing devices used in clearing structures that were fumigated with sulfuryl fluoride with the goal of increasing performance and overall reliability of data collected from these devices.

The Laboratory also will continue to provide technical and analytical assistance to EPA's Enforcement and Compliance Assurance Program and regional offices in support of their enforcement/complaint cases, including analysis of dicamba and its metabolites in soil and vegetation samples and analysis of products sold in online commerce.

The Analytical Chemistry Laboratory also will continue to provide national technical analytical support for the development of data needed for the Pesticides Program's risk assessments and for Section 18 emergency exemptions, and to perform studies for use in risk mitigation.

Performance Measure Targets:

Work under this program supports performance results in the Pesticides: Protect the Environment from Pesticide Risk Program under the EPM appropriation.

FY 2024 Change from FY 2023 Enacted Budget (Dollars in Thousands):

- (-\$42.0) This change to fixed and other costs is a decrease due to the recalculation of base workforce costs due to annual payroll increases, adjustments to provide essential workforce support, and changes to benefits costs.
- (-\$39.0) This change to fixed and other costs is a decrease due to the recalculation of laboratory fixed costs for utilities and security.
- (+\$86.0) This program change is an increase in laboratory Operations and Maintenance costs.

Statutory Authority:

Federal Insecticide, Fungicide and Rodenticide Act (FIFRA); Endangered Species Act (ESA).

Pesticides: Realize the Value of Pesticide Availability

Program Area: Pesticides Licensing

Goal: Ensure Safety of Chemicals for People and the Environment

Objective(s): Ensure Chemical and Pesticide Safety

(Dollars in Thousands)

	FY 2022 Final Actuals	FY 2023 Enacted Operating Plan	FY 2024 President's Budget	FY 2024 President's Budget v. FY 2023 Enacted Operating Plan
Environmental Programs & Management	\$7,022	\$7,637	\$8,234	\$597
<i>Science & Technology</i>	<i>\$941</i>	<i>\$925</i>	<i>\$1,002</i>	<i>\$77</i>
Total Budget Authority	\$7,963	\$8,562	\$9,236	\$674
Total Workyears	32.7	35.8	35.8	0.0

Program Project Description:

EPA's Pesticide Program laboratories provide significant contributions to help the Agency realize the value of pesticides. They consist of the Microbiology Laboratory⁶⁰ and the Analytical Chemistry Laboratory,⁶¹ both of which support the goal of protecting human health and the environment through diverse analytical testing, analytical method development, and validation efforts. Laboratories provide a variety of technical services to EPA, other federal and state agencies, tribal nations, and other organizations to ensure the value of pesticide availability is realized.

The primary focus of the Microbiology Laboratory is standardization of existing test methods and the development and validation of methods for new uses and emerging pathogens for antimicrobial products with public health claims – products used to kill or suppress the growth of pathogenic microorganisms on inanimate objects and surfaces. The Microbiology Laboratory is instrumental in advancing the science of antimicrobial product testing and provides technical expertise to standard-setting organizations and various agency stakeholder groups.

The Analytical Chemistry Laboratory provides scientific, laboratory, and technical support through chemical analyses of pesticides and related chemicals to protect human health and the environment. The Analytical Chemistry Laboratory's responsibilities include providing technical support and chemical analyses of pesticides and related chemicals; developing new multi-residue analytical methods; and operating EPA's National Pesticide Standard Repository,⁶² which collects and maintains pesticide standards (*i.e.*, samples of pure active ingredients or technical grade active ingredients, regulated metabolites, degradants, and related compounds).

⁶⁰ For additional information, please visit: <https://www.epa.gov/aboutepa/about-microbiology-laboratory>.

⁶¹ For additional information, please visit: <https://www.epa.gov/aboutepa/about-analytical-chemistry-laboratory-acl>.

⁶² For additional information, please visit: <https://www.epa.gov/pesticide-analytical-methods/national-pesticide-standard-repository>.

FY 2024 Activities and Performance Plan:

Work in this program directly supports Goal 7/Objective 7.1, Ensure Chemical and Pesticide Safety in the *FY 2022 – 2026 EPA Strategic Plan*. In FY 2024, EPA will realize the benefits of pesticides by ensuring the continued operation of the National Pesticide Standard Repository. The Microbiology Laboratory and the Analytical Chemistry Laboratory will continue to conduct chemistry and efficacy evaluations for antimicrobials. As the recognized source for expertise in pesticide analytical method development, EPA's Pesticide Program laboratories will continue to provide quality assurance review, technical support, and training to EPA's regional offices, state laboratories, and other federal agencies that implement the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA).

The Analytical Chemistry Laboratory will continue to maintain the National Pesticide Standard Repository (NPSR) and collect and maintain an inventory of analytical standards of registered pesticides in the U.S. EPA provides these pesticide standards (approximately 4,000 to 5,000 annually) to qualified federal, state, territorial, and tribal laboratories for food and product testing, environmental monitoring, and enforcement purposes. This lab has implemented several changes in the operation of the NPSR to increase its efficiency and to better serve regulatory laboratories. Changes included requiring requests to be grouped for pesticide standards, instituting an inventory control system focusing on high demand standards, asking registrants to package pesticide standards in ready-to-be-shipped quantities, and installing a chemist as the lead staff person to ensure adherence to new protocols. These changes resulted in the improvement in the operations of the lab including a decrease in the turnaround time for shipping repository samples from 15 to 10 days. These changes also helped federal agencies, states, and tribal laboratories expedite enforcement efforts. Further process enhancements will continue in FY 2024 and beyond, specifically in minimizing the number of non-usable expired standards that are shipped as chemical waste.

In FY 2024, the Analytical Chemistry Laboratory also will continue its work in: developing and validating multiresidue methods using state-of-the-art methodology and instrumentation; providing chemical analysis for assessing risk to human health and to the environment from agricultural use of pesticides; and providing technical support to EPA regional offices to ensure that pesticide products are formulated according to approved labels.

In FY 2024, the Microbiology Laboratory will continue to evaluate FIFRA Section 18 emergency exemptions and novel protocol requests for new uses and novel pathogens. The Laboratory also will continue the development of data and methods to support Section 18 for high consequence animal pathogens (*e.g.*, African swine fever, Newcastle disease virus, etc.). In addition, the continued work to develop new methods for emerging pathogens (*e.g.*, *Legionella*, *Candida auris*, etc.) and clinical porous materials provides a pathway for registrants to add new claims to existing antimicrobial pesticides. In some cases, the methods will lead to the development of new products when currently registered formulations are not effective against emerging pathogens. The Laboratory anticipates supporting up to 25 requests for these activities in FY 2024.

The Microbiology Laboratory also will continue to refine and develop methods to support EPA's Section 3 and Section 18 regulatory programs, continuing to develop testing methods for

evaluating effectiveness of disinfectant products against airborne SARS-CoV-2 virus and other emerging pathogens. In addition, the Laboratory will collaborate with EPA's Homeland Security Research Program to develop guidance for registrants seeking to make long-term disinfectant efficacy claims and explore novel control and application options for disinfectant products. The Laboratory also will continue to develop a quantitative efficacy test method which may provide a pathway for evaluating disinfectant claims for porous material (vinyl, room divider curtains, etc.).

Performance Measure Targets:

Work under this program supports performance results in the Pesticides: Protect the Environment from Pesticide Risk Program under the EPM appropriation.

FY 2024 Change from FY 2023 Enacted Budget (Dollars in Thousands):

- (-\$5.0) This change to fixed and other costs is a decrease due to the recalculation of base workforce costs due to annual payroll increases, adjustments to provide essential workforce support, and changes to benefits costs.
- (-\$76.0) This change to fixed and other costs is a decrease due to the recalculation of lab fixed costs for utilities and security.
- (+\$158.0) This program change is an increase to support laboratory Operations and Maintenance costs.

Statutory Authority:

Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA); Federal Food, Drug, and Cosmetic Act (FFDCA) § 408.

Research: Air and Energy

Research: Air, Climate and Energy

Program Area: Research: Air, Climate and Energy
Cross-Agency Mission and Science Support

(Dollars in Thousands)

	FY 2022 Final Actuals	FY 2023 Enacted Operating Plan	FY 2024 President's Budget	FY 2024 President's Budget v. FY 2023 Enacted Operating Plan
<i>Science & Technology</i>	<i>\$93,402</i>	<i>\$100,448</i>	<i>\$137,835</i>	<i>\$37,387</i>
Total Budget Authority	\$93,402	\$100,448	\$137,835	\$37,387
Total Workyears	263.8	264.0	298.7	34.7

Program Project Description:

Air pollution adversely affects human health and the environment, yet millions of Americans still live in or near geographic areas that do not meet national standards for air pollutants. Climate change is impacting public health, air, and water quality today and will exacerbate other environmental challenges in the future. Many air pollution sources are in communities with environmental justice concerns which can be further exacerbated by the impacts of climate change. To address these and other air pollution issues, including the growing threat of air pollution from wildfires exacerbated by climate change, EPA's Air, Climate, and Energy (ACE) Research Program provides scientific information to EPA program and regional offices, tribes states, and other partners. ACE advances the science needed to attain the National Ambient Air Quality Standards (NAAQS),⁶³ reduce emissions of hazardous air pollutants (HAPs), address the causes and consequences of climate change and environmental inequities, and develop more resilient communities to protect human health and ecosystems. The ACE Research Program also contributes to understanding the impacts of interventions that reduce air pollution exposures and protect public health; strategies to prepare, adapt, and build resilience; and responses to the transformation of our energy systems.

The ACE Research Program is centered around two inter-related research topic areas: 1) understanding air pollution and climate change and their impacts on human health and ecosystems; and 2) responding to risks and impacts and preparing for the future. The ACE Research Program relies on successful partnerships with a variety of organizations including academic and industry researchers, tribes, states, local and private sector organizations, as well as key federal agencies.

⁶³ Section 109 of the Clean Air Act identifies two types of national ambient air quality standards – primary standards provide public health protection, including protecting the health of “sensitive” populations such as children, older adults, and persons with pre-existing disease such as asthma or cardiovascular disease and secondary standards provide public welfare protection, including protection against decreased visibility and damage to animals, wildlife, soils, water, crops, vegetation, and buildings. Unless otherwise stated, in this document the term NAAQS will refer to both primary and secondary standards.

Recent Accomplishments of the ACE Research Program include:⁶⁴

- **Air Pollution, Climate Change and Ecosystem Health:** In FY 2022, EPA researchers modeled atmospheric deposition of nitrogen to ecosystems including the Chesapeake Bay⁶⁵ and estimated critical loads of nitrogen for plants and trees in the U.S.⁶⁶ The research showed that while decreases in nitrogen emissions have reduced the percentage of vegetation exceeding critical loads for loss of species abundance, over a third of studied plots are still at risk and would benefit from additional nitrogen reductions. EPA researchers studied how ozone exposures impact growth of trees, finding that ozone responsiveness varies by species, and that black cherry, tulip poplar and ponderosa pine are among the most ozone-sensitive North American tree species.⁶⁷ EPA researchers also used flow models and high-resolution survey data to examine habitat suitability for Chinook salmon. They found that future climate conditions may have a substantial negative impact on spawning and limited impact on rearing conditions due to flow reduction.¹¹
- **Modeling of Scenarios for Energy and Transportation System Emissions:** In FY 2022, EPA researchers employed state-of-the-art energy systems models to analyze transformations in the U.S. energy and transportation systems and characterize pollutant emission changes from adoption of various technologies and policies. Model results showed that increases in electric vehicles can have varying impacts on overall system-wide CO₂ and NO_x emissions, depending on how the electricity used to power those vehicles is produced. High adoption of electric vehicles would likely reduce CO₂ emissions, with greater reductions resulting if electricity production is produced with renewables or otherwise decarbonized sources⁶⁸. Researchers also developed a new tool, the Global Change Analysis Model Long-term Interactive Multi-pollutant Scenario Evaluator (GLIMPSE), to assist in air quality, climate, and energy planning.⁶⁹
- **Wildfire Smoke:** Climate change is contributing to increased size and intensity of wildfires, and states and communities are increasingly concerned about exposures to wildfire smoke. In FY 2022, EPA researchers conducted studies of smoke emissions and air quality measurement during wildfires. The research showed that small, lower-cost air quality sensors, while not as accurate as federal reference monitors, can provide useful data about community air quality and exposures during wildfire smoke events.⁷⁰ Researchers also evaluated how smoke plumes are represented in air quality models and reinforced that accurate information on meteorology, timing, and heat release during fires are critical for predicting smoke plume heights which affect downwind air quality.⁷¹ In FY 2022, EPA researchers also applied their research on air quality sensors to develop the Wildfire Smoke Air Monitoring Response Technology

⁶⁴ For more information, please see <https://www.epa.gov/research/national-research-programs>.

⁶⁵ For more information, please see <https://acp.copernicus.org/preprints/acp-2022-201/> and <https://doi.org/10.1016/j.atmosenv.2021.118277>.

⁶⁶ For more information, please see <https://onlinelibrary.wiley.com/doi/full/10.1111/gcb.16076>.

⁶⁷ For more information, please see <https://www.sciencedirect.com/science/article/pii/S1352231022002564?via%3Dihub>.

⁶⁸ For more information, please see: <https://www.sciencedirect.com/science/article/pii/S0306261921007698>.

⁶⁹ For more information, please see: <https://www.epa.gov/research-states/supporting-air-quality-and-climate-change-planning-glimpse-webinar-archive>

⁷⁰ For more information, please see <https://www.mdpi.com/2073-4433/13/6/877/htm> and <https://www.sciencedirect.com/science/article/pii/S1352231021005409>.

⁷¹ For more information, please see <https://www.publish.csiro.au/wf/pdf/WF20140>.

(WSMART) program which loans lower-cost air quality sensors to state, tribal, and local air quality organizations to improve characterization of air quality during wildfire smoke events.⁷² Researchers also evaluated the performance of various portable air cleaners, including “do it yourself” or DIY models, and found that DIY air cleaners can effectively reduce indoor fine particle concentrations during simulated wildfire smoke events.⁷³

FY 2024 Activities and Performance Plan:

Work in this program provides Cross-Agency Mission and Science Support and is allocated across strategic goals and objectives in the *FY 2022-2026 EPA Strategic Plan*.

The ACE Research Program prioritizes key activities to support attainment of the NAAQS and implementation of stationary and mobile source regulations, as well as foundational science to inform decision making with consideration of increasing climate change impacts. The ACE Research Program includes work to develop, evaluate, and apply measurement methods and models incorporating the latest physical science and understanding of behaviors that impact the system. The planned research responds to identified needs in areas of emerging concern to the Administration, EPA, tribes, and state policymakers, including climate change, environmental justice (EJ) and equity, PFAS, ethylene oxide, and wildland fires.

In FY 2024, the ACE Research Program will continue to:

- Assess human and ecosystem exposures and effects associated with air pollutants on individual, community, regional, national, and global scales, both today and in the future, under a changing climate.⁷⁴
- Assess the consequences of climate change and the vulnerability of communities and ecosystems to climate change impacts, including wildfires and other extreme events; and identify and evaluate strategies to adapt and build resilience to these impacts.
- Advance the Administration’s science-based approach to improving wildfire readiness by enhancing wildfire data and communications related to air quality and helping communities become “smoke ready.” Smoke-ready communities benefit community health by coordinating community-level action related to monitoring outdoor air quality, creating clean indoor air, and communicating actionable public health messaging.
- Characterize disproportionate impacts of climate change and air pollution in vulnerable communities and identify and evaluate strategies to reduce impacts in those communities.
- Develop and evaluate innovative multi-pollutant and sector-based approaches to preventing pollution, particularly in vulnerable communities.

⁷² For more information, please see <https://www.epa.gov/air-sensor-toolbox/wildfire-smoke-air-monitoring-response-technology-wsmart-pilot>.

⁷³ For more information, please see <https://onlinelibrary.wiley.com/doi/10.1111/ina.13163>

⁷⁴ Beyond effects associated with ambient air exposures, consideration of potential human and ecosystem exposures and effects associated with deposition of air pollutants to water and land are also evaluated.

- Characterize the positive and negative environmental effects of energy efficiency and renewable energy and evaluate strategies to expand the benefits of transformations in transportation and energy systems, especially for vulnerable communities.
- Develop and evaluate low-cost approaches to measure methane from fugitive and area sources, including leaks from oil and gas production and emissions from municipal solid waste landfills, as well as approaches for measuring methane and other GHG from reservoirs and other water bodies.
- Provide human exposure and environmental modeling, monitoring, metrics, and information needed to inform air quality and climate change decision-making at the federal, tribal, state, and local level.
- Deliver state-of-the-art tools that tribes and states can use to identify effective emission reduction strategies to meet the NAAQS and enhance air quality measurement and modeling methods to ascertain current and future compliance with the NAAQS, including potential impacts from the changing climate.
- Develop and apply approaches to evaluate the positive and negative environmental impacts of the transition to a low-carbon energy system, including development of a report to Congress on the environmental and resource conservation impacts of the Renewable Fuel Standard.⁷⁵
- Provide support to Regional Offices and state, tribal, and community partners to address increased needs for scientific information, tools, and data to inform effective climate change adaptation and mitigation actions at local scale.
- Produce a peer-reviewed scientific guidance document for ambient measurement approaches for ethylene oxide—a hazardous air pollutant of growing concern to states and communities.

In addition, the ACE Research Program will implement the EPA Climate Adaptation Action Plan, support increased resilience of EPA's programs, and strengthen the capacity of states, tribes, territories, and communities.

Research Planning:

EPA research is built around six integrated and transdisciplinary research programs. Each of the six programs is guided by a Strategic Research Action Plan (StRAP) that is developed with and reflects the research needs of Agency programs and regional offices, states, and tribes. Each research program has developed and published their fourth generation of the StRAPs,⁷⁶ which

⁷⁵ Required by the Energy Independence and Security Act of 2007, PL110-140. For more information, please see: <https://www.epa.gov/laws-regulations/summary-energy-independence-and-security-act>. More information about the report is available at: https://cfpub.epa.gov/si/si_public_record_report.cfm?Lab=IO&dirEntryId=341491.

⁷⁶ The StRAPs are available and located here: <https://www.epa.gov/research/strategic-research-action-plans-fiscal-years-2023-2026>.

continue the practice of conducting innovative scientific research aimed at solving the problems encountered by the Agency and its stakeholders.

The Office of Research and Development (ORD) works with various external groups, including communities, to ensure the integrity and value of its research through a variety of mechanisms that include:

- EPA’s Board of Scientific Counselors (BOSC)
 - ORD meets regularly with this committee, which provides advice and recommendations to ORD on technical and management issues of its research programs.
- State Engagement
 - EPA’s state engagement⁷⁷ is designed to inform states about their role within EPA and EPA’s research programs and to better understand the science needs of state environmental and health agencies.
- Tribal Partnerships
 - Key tribal partnerships are established through the Tribal Science Program, which provides a forum for the interaction between tribal and Agency representatives. These interactions identify research of mutual benefit and lead to collaborations on important tribal environmental science issues.

Performance Measure Targets:

(PM RD2) Number of ORD activities related to environmental justice that involve or are designed to be applicable to tribes, states, territories, local governments, and communities.

	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	Units
Target						No Target Established	113	113	Activities
Actual						N/A			

(PM RD3) Percentage of Office of Research and Development (ORD) climate-related research products meeting partner needs.

	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	Units
Target						93	94	94	Percent
Actual					100	100			
Numerator					5	7			Products
Denominator					5	7			

⁷⁷ For more information, please see: <https://www.epa.gov/research/epa-research-solutions-states>.

(PM RD4) Percentage of Office of Research and Development (ORD) environmental justice-related research products meeting partner needs.

	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	Units
Target						93	94	94	Percent
Actual						100			
Numerator						1			Products
Denominator						1			

FY 2024 Change from FY 2023 Enacted Budget (Dollars in Thousands):

- (+\$1,436.0) This change to fixed and other costs is an increase due to the recalculation of base workforce costs for existing FTE due to annual payroll increases, adjustments to provide essential workforce support, and changes to benefits costs. This includes support for critical agencywide infrastructure for Executive Order 14028 cybersecurity requirements, electronic discovery for FOIA and litigation support, and implementation of Trusted Vetting 2.0.
- (+\$63.0) This change to fixed and other costs is an increase due to the recalculation of laboratory fixed costs.
- (+\$34,700.0 / +33.7 FTE) This net program change reflects an increase to the Air, Climate, and Energy Research Program. This increase is targeted to EPA's commitment to enhance its efforts to combat the global issue of Climate Change. This increase will substantially advance research to assess the impacts of climate change on human health and ecosystems. This investment includes \$6.522 million in payroll.
- (+\$1,188.0 / +1.0 FTE) This program change will provide support to implement the EPA Climate Adaptation Action Plan, support increased resilience of EPA's programs, and strengthen the capacity of states, tribes, territories, and communities. This investment includes \$182 thousand in payroll.

Statutory Authority:

Clean Air Act; Title II of Energy Independence and Security Act of 2007; Environmental Research, Development, and Demonstration Authorization Act (ERDDAA); National Environmental Policy Act (NEPA) § 102; Pollution Prevention Act (PPA); Global Change Research Act of 1990.

Research: Chemical Safety and Sustainability

Research: Chemical Safety for Sustainability

Program Area: Research: Chemical Safety for Sustainability
Cross-Agency Mission and Science Support

(Dollars in Thousands)

	FY 2022 Final Actuals	FY 2023 Enacted Operating Plan	FY 2024 President's Budget	FY 2024 President's Budget v. FY 2023 Enacted Operating Plan
Environmental Programs & Management	\$178	\$0	\$0	\$0
<i>Science & Technology</i>	<i>\$92,353</i>	<i>\$92,550</i>	<i>\$103,878</i>	<i>\$11,328</i>
Hazardous Substance Superfund	\$2,579	\$8,060	\$8,060	\$0
Total Budget Authority	\$95,110	\$100,610	\$111,938	\$11,328
Total Workyears	275.2	276.7	307.4	30.7

Program Project Description:

EPA's Chemical Safety for Sustainability (CSS) Research Program provides scientific and technical approaches, information, tools, and methods to support the Agency and others in making better-informed and more timely decisions about chemicals and their potential risks to human health and the environment.⁷⁸ Products under the CSS program strengthen the Agency's ability to use the best available science to evaluate and predict human health and ecological impacts from the use, reuse, recycling, and disposal of manufactured and naturally occurring chemicals and their by-products.

The CSS Research Program informs Agency decisions about chemicals, accelerates the pace of chemical assessment and decision-making, and helps replace, reduce, and refine the use of mammals in evaluating chemical risks to ecological systems and human health. CSS products inform various Agency programs established to implement environmental regulations and govern Agency actions – which includes evaluating existing and new chemicals (Toxic Substances Control Act [TSCA]); developing and using alternative testing protocols (TSCA, Federal Insecticide Fungicide and Rodenticide Act [FIFRA]); protecting the Nation's food supply (Food Quality Protection Act [FQPA]); addressing product safety (Federal Food Drug Cosmetics Act [FFDCA]); supporting chemical prioritization (TSCA, Safe Drinking Water Act [SDWA]); supporting the development of safer and more sustainable chemicals and alternatives (Pollution Prevention [P2] Act [PPA]); evaluating pesticide registrations (FIFRA, Endangered Species Act); and mitigating Resource Conservation and Recovery Act (RCRA) and Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Superfund remediation sites.

Research activities under CSS are coordinated with the activities of other national research programs and the results produced inform several cross-cutting, high priority research topics. For example, planned research will address per- and polyfluoroalkyl substances (PFAS), climate change, and risks in communities with environmental justice (EJ) concerns. Coordination with the

⁷⁸ For the current CSS StRAP, please see: [Strategic Research Action Plans Fiscal Years 2023-2026 \(Drafts\) | US EPA](#).

Health and Environmental Risk Assessment (HERA) Research Program ensures that the approaches, tools, and information produced under CSS can be used to improve chemical risk assessments, reduce uncertainties associated with those assessments, and increase the speed of delivering chemical information to the Agency.

The CSS Research Program is organized into eight integrated research areas that include research on toxicity, exposure, human health, ecological health, chemical modeling and prediction, and chemical integration and informatics. These research areas fulfill requirements for chemical evaluation under TSCA (as amended by the Frank R. Lautenberg Chemical Safety for the 21st Century Act); as part of SDWA; pesticide evaluation under FIFRA; chemical testing for endocrine system impacts under FQPA; Agency implementation of TSCA Section 5 (New Chemicals) and Section 6 (Existing Chemicals); the development of safer and more sustainable chemicals and alternatives under PPA and TSCA, and identification of contaminants of emerging concern. The CSS Research Program provides ongoing support to the Agency's Chemical Safety and Pollution Prevention Program for the successful implementation of these TSCA activities, as well as their evaluation of pesticides under FIFRA.⁷⁹

Recent Accomplishments of the CSS Research Program include:

- **Development and Advancement of New Approach Methods (NAMs):** EPA objectives and research activities under CSS are strongly supporting the development of NAMs that will improve the Agency's understanding of chemical toxicity. NAMs focus on using faster, less expensive approaches that reduce the use of mammals for toxicity testing. CSS continues to collaborate closely with the Chemical Safety and Pollution Prevention Program to implement the June 2018 TSCA Strategic Plan⁸⁰ that emphasizes the development and implementation of alternative test methods. Additionally, research under CSS is a key component of the December 2021 NAMs Workplan.⁸¹ Critical to this effort is implementation of a tiered hazard evaluation strategy. Agency researchers are currently advancing methods in high-throughput phenotypic profiling (HTPP) and high-throughput transcriptomics (HTTr). NAMs can be used to group and prioritize chemicals, e.g., as illustrated in the recent PFAS categorization paper.⁸² Additionally, researchers are exploring approaches and models for species extrapolation in the ecotoxicology domain, and development of high-throughput exposure and toxicokinetic models. Documented in an EPA report from May 2021,⁸³ Agency research enabled development of a method to integrate publicly available hazard, exposure, persistence, and bioaccumulation information for more than 33,000 chemical substances, including both traditional and NAM data. The method allows for discriminating between chemicals that have the potential to present hazard or exposure concerns and those that do not.
- **Continued Release, Evolution, and Updating of Multiple Digital Information Products to Inform Decision Making:** The *CompTox Chemicals Dashboard*⁸⁴ is the Agency's 'first-stop-

⁷⁹ For more information, please see: <https://www.epa.gov/chemical-research>.

⁸⁰ For more information, please see: https://www.epa.gov/sites/production/files/2018-06/documents/epa_alt_strat_plan_6-20-18_clean_final.pdf.

⁸¹ For more information, please see: <https://www.epa.gov/chemical-research/new-approach-methods-work-plan>.

⁸² For more information, please see: <https://www.sciencedirect.com/science/article/pii/S246811132200038X>.

⁸³ For more information, please see: https://cfpub.epa.gov/si/si_public_pra_view.cfm?dirEntryID=349776&Lab=CCTE.

⁸⁴ For more information, please see: <https://comptox.epa.gov/dashboard>.

shop’ for information on chemical properties, characteristics, structure, toxicity, exposure, and persistence. The *Dashboard* is used by the Agency and its external partners to generate real-time quantitative structure-activity relationship (QSAR) predictions for chemical property and toxicity endpoints. It allows for flexible searches including chemical and functional use and has batch search functionality. As of the December 2022 release, the *Dashboard* contains curated data on over 1.2 million chemicals. The *ECOTOX Knowledgebase*⁸⁵ serves as the comprehensive, publicly available source of environmental toxicity data on aquatic life, terrestrial plants, and wildlife. The December 2022 release of the *ECOTOX Knowledgebase* contains over 1.1 million records and provides information on over 12,000 chemicals and over 13,000 species from over 50,000 references. The *Chemical Transformation Simulator* continues to develop as a web-based tool for predicting environmental and biological transformation pathways for organic chemicals. Recently, the *Simulator* was expanded to include environmental transformation information for PFAS chemicals. *SeqAPASS*⁸⁶ – Sequence Alignment to Predict Across Species Susceptibility – is a tool enabling extrapolation of toxicity information across species. Version 6.1, released in June 2022, features updated protein and taxonomy data and improved functionalities and visualization of results. Research and development for all these systems continues to meet the information needs of decision makers.

FY 2024 Activities and Performance Plan:

Work in this Program provides Cross-Agency Mission and Science Support and is allocated across strategic goals and objectives in the *FY 2022-2026 EPA Strategic Plan*.

The objective of research activities under the CSS program is to inform risk-based decisions made by EPA programs, states, tribes, and others. Of particular importance are ‘chemicals of immediate and emerging concern’, such as PFAS, which heighten the need for rapid scientific approaches to evaluate potential chemical safety. In FY 2024, research activities will continue to support implementation of the *PFAS Strategic Roadmap*.⁸⁷ With additional FY 2024 investment in TSCA, CSS will support a collaborative research program for new chemicals with the Chemical Safety and Pollution Prevention Program that is focused on modernizing the process and incorporating scientific advances in new chemical evaluations under TSCA.

In FY 2024, research efforts will also focus on replacing, reducing, and refining the use of mammals in testing, while accelerating the pace of chemical assessment and decision-making. Agency research products will continue to use innovative *in vitro* and *in silico* (computer modeling) approaches to provide more timely and comprehensive information about chemical hazard and exposure while still providing information of equal or greater biological predictivity than current *in vivo* animal models.

⁸⁵ For more information, please see: <https://cfpub.epa.gov/ecotox/>.

⁸⁶ For more information, please see: <https://www.epa.gov/chemical-research/sequence-alignment-predict-across-species-susceptibility>.

⁸⁷ See EPA’s PFAS Strategic Roadmap at: https://www.epa.gov/system/files/documents/2021-10/pfas-roadmap_final-508.pdf.

Selected research areas are highlighted below for work in FY 2024.

- **High-Throughput Toxicity (HTT) Testing:** This research is focused on developing, testing, and applying NAMs to evaluate chemical hazards, with an emphasis on developmental neurotoxicology, inhalation toxicology, thyroid disruption, and methodologically challenging chemicals. These will enable EPA to make better, more timely decisions about chemicals by increasing available toxicological information for more chemicals.
- **Rapid Exposure and Dosimetry (RED) and Ecotoxicological Assessment and Modeling (ETAM):** This research parallels work in the HTT research area to provide information to inform Agency chemical risk assessment activities. Chemical exposure research also includes the continued development of advanced analytical and computational tools, such as non-targeted analysis, to detect and identify unknown chemicals in complex environmental media, biological media, and consumer products. Non-targeted analysis has been critical for the identification of previously unknown PFAS chemicals in the environment. Ecotoxicological Assessment and Modeling efforts support the Agency's work considering the impacts to pollinators. Specifically, research includes assessing the impacts of pesticides on honeybees and pollen bees to support pesticide assessments.
- **PFAS Research:**⁸⁸ PFAS are a class of substances of concern and EPA is committed to helping states, tribes, and local communities understand and manage risks associated with these chemicals.⁸⁹ For most PFAS chemicals, there are little or no published toxicity data available. The Agency is addressing this gap by conducting high-throughput toxicological screening assays on hundreds of PFAS chemicals. In FY 2024, the CSS Research Program will build upon the research foundation formed from completed work outlined in the *PFAS Strategic Roadmap*.⁹⁰ For more information on Agency PFAS research, please see the CSS Research Program narrative for the Superfund appropriation.
- **Improved Understanding of Biological Impacts:** This research helps decision-makers understand the significance of chemical impacts on biological systems. This is especially important as EPA seeks to understand chemical impacts on developmental and reproductive biology. This program will employ data generated from its chemical evaluation research to develop interpretive frameworks and models to place complex information into biological, chemical, and toxicological context. Data developed in the HTT and Virtual and Complex Tissue Modeling research areas will contribute to the study of adverse outcome pathways (AOPs), which link molecular initiating events at the cellular level to apical outcomes expressed at the whole animal level.
- **Delivery and Translation of Chemical Information:** The Chemical Characterization and Informatics and Integration, Translation, and Knowledge Delivery research areas will continue to provide computational, predictive tools to estimate physicochemical, toxicological, and

⁸⁸ For more information, please see: https://www.epa.gov/sites/production/files/2019-02/documents/pfas_action_plan_021319_508compliant_1.pdf.

⁸⁹ For more information, please see: <https://www.epa.gov/pfas/pfas-community-engagement>.

⁹⁰ For more information, please see: <https://www.epa.gov/pfas/pfas-strategic-roadmap-epas-commitments-action-2021-2024>.

exposure information for data poor chemicals. Collaborative efforts are underway in the Agency to build program-specific applications such as RapidTox that facilitate access and use of relevant information to support different decision contexts. These applications will give risk assessors and decision-makers confidence that the new approaches, data, and tools developed in under the CSS program are both scientifically robust and relevant to environmental decision making.

Research Planning:

EPA research is built around six integrated and transdisciplinary research programs. Each of the six programs is guided by a Strategic Research Action Plan (StRAP) that reflects the research needs of Agency program and regional offices, states, and tribes, and is planned with their active involvement. Each research program has developed and published the fourth generation of the StRAPs,⁹¹ which will continue the practice of conducting innovative scientific research aimed at comprehensively assessing and solving the problems encountered by the Agency and its stakeholders.

EPA works with various groups, including communities, to ensure the integrity and value of its research and research planning efforts through a variety of mechanisms that include:

- EPA's Board of Scientific Counselors (BOSC)
 - The Office of Research and Development (ORD) meets regularly with this committee, which provides advice and recommendations to ORD on technical and management issues of its research programs.
- State Engagement
 - EPA's state engagement⁹² is designed to inform states about their role within EPA and EPA's research programs, and to better understand the science needs of state environmental and health agencies.
- Tribal Partnerships
 - Key tribal partnerships are established through the Tribal Science Program which provides a forum for the interaction between tribal and Agency representatives. These interactions identify research of mutual benefit and lead to collaborations on important tribal environmental science issues.

⁹¹ The StRAPs are available and located here: <https://www.epa.gov/research/strategic-research-action-plans-fiscal-years-2023-2026>.

⁹² For more information, please see: <https://www.epa.gov/research/epa-research-solutions-states>.

Performance Measure Targets:

(PM RD1) Percentage of Office of Research and Development (ORD) research products meeting partner needs.

	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	Units
Target		No Target Established	77	80	81	93	94	94	Percent
Actual		77	79	80	94	94			
Numerator		171	154	120	60	77			Products
Denominator		222	196	150	64	82			

(PM RD5) Number of actions implemented for EPA scientific integrity objectives.

	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	Units
Target						No Target Established	21	21	Actions
Actual						N/A			

FY 2024 Change from FY 2023 Enacted Budget (Dollars in Thousands):

- (+\$2,118.0) This change to fixed and other costs is an increase due to the recalculation of base workforce costs for existing FTE due to annual payroll increases, adjustments to provide essential workforce support, and changes to benefits costs.
- (+\$39.0) This change to fixed and other costs is an increase due to the recalculation of laboratory fixed costs.
- (+\$2,981.0 / +6.5 FTE) This program change supports a collaborative research program for new chemicals with OCSPP that is focused on modernizing the process and incorporating scientific advances in new chemical evaluations under TSCA. This increase in funding will lead to the development and translation of science towards effectively and efficiently informing regulatory and policy decisions by the Agency and external partners, and thus increasing access to clean and safe air, land, and water for all communities across the Nation. This investment includes \$1.219 million in payroll.
- (+\$6,190.0 / +22.0 FTE) This program change reflects an increase in resources and FTE that will support providing scientific and technical approaches, information tools, and methods to better inform decision-making. This investment includes \$4.124 million in payroll.

Statutory Authority:

Clean Air Act §§ 103, 104; Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA); Children's Health Act; 21st Century Nanotechnology Research and Development Act; Clean Water Act; Federal Food, Drug, and Cosmetic Act (FFDCA); Federal Insecticide, Fungicide and Rodenticide Act (FIFRA); Pollution Prevention Act (PPA); Resource Conservation and Recovery Act (RCRA); Safe Drinking Water Act (SDWA); Toxic Substances Control Act (TSCA).

Health and Environmental Risk Assessment

Program Area: Research: Chemical Safety for Sustainability
Cross-Agency Mission and Science Support

(Dollars in Thousands)

	FY 2022 Final Actuals	FY 2023 Enacted Operating Plan	FY 2024 President's Budget	FY 2024 President's Budget v. FY 2023 Enacted Operating Plan
<i>Science & Technology</i>	<i>\$38,740</i>	<i>\$39,918</i>	<i>\$44,942</i>	<i>\$5,024</i>
Hazardous Substance Superfund	\$9,405	\$4,901	\$5,005	\$104
Total Budget Authority	\$48,145	\$44,819	\$49,947	\$5,128
Total Workyears	159.5	155.9	177.9	22.0

Program Project Description:

EPA's Health and Environmental Risk Assessment (HERA) Research Program is focused on the science and practice of assessments that inform decisions made by EPA and others, including states and tribes. These assessments provide the scientific basis for decisions under an array of environmental laws, including the: Clean Air Act (CAA), Clean Water Act (CWA), Safe Drinking Water Act (SDWA), Toxic Substances Control Act (TSCA), and Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). The HERA Research Program is multidisciplinary and aimed at leveraging scientific innovations to advance the analytic approaches and applications needed to address wide-ranging risk assessment requirements in support of these various statutes.

The current portfolio of products under HERA encompasses these two topic areas:

- **Science Assessments and Translation:** The HERA Research Program produces a portfolio of assessment products that both optimizes the application of the best available science and technology and remains responsive to Agency priorities and timelines. The current portfolio of 'fit-for-purpose' assessment includes both traditional assessment lines – Integrated Risk Information System (IRIS), Integrated Science Assessment (ISAs), and Provisional Peer-Reviewed Toxicity Values (PPRTVs) – as well as a wide range of other innovative assessment products. Additionally, significant emphasis is placed on providing scientific and technical support to decision-makers throughout the lifecycle of decisions, from the development to the translation and application of assessment products.
- **Advancing the Science and Practice of Risk Assessment:** Research under this topic is targeted to enhance hazard characterization, expand the repertoire of dose-response methods and models, and characterize the utility of emerging data and new computational tools as applied to risk assessment. It also enhances and maintains critical assessment infrastructure such as databases, models, and software to ensure transparency and facilitate understanding and translation by Agency and external partners as well as other users. Refinements to current approaches are expected to improve the accuracy, efficiency, flexibility, and utility of applications across a large landscape of assessment activities.

Recent Accomplishments of the HERA Program include:

The HERA Research Program has developed assessment products that inform science-based decision making, enhance timely responses, improve screening capabilities, and augment toxicity value derivations for use in risk assessments.

- **Portfolio of Assessment Products:** As EPA reconsidered the particulate matter and ozone National Ambient Air Quality Standards, HERA provided the scientific foundation for the reexamination; a *Supplement to the 2019 ISA for Particulate Matter*,⁹³ which was finalized in April 2022. Agency researchers under HERA continue to deliver on EPA's commitment to address Per- and polyfluoroalkyl substances (PFAS) in the environment and released the final *IRIS Assessment for Perfluorobutanoic Acid and Related Salts*⁹⁴ in December 2022, and the draft *IRIS Assessment for Perfluorohexanoic Acid and Related Salts*⁹⁵ in April 2022. In FY 2023, EPA anticipates publicly releasing the final IRIS assessment for perfluorohexanoic acid and related salts.⁹⁶ In FY 2022, the Agency released seven PPRTV assessments. In FY 2023, EPA anticipates delivering four to nine additional high-priority PPRTV assessments to support Superfund priorities⁹⁷. In FY 2022, the agency publicly released the draft *IRIS Toxicological Review of Formaldehyde-Inhalation*.⁹⁸ In FY 2023, the Agency also anticipates publicly releasing scoping and problem formulation materials such as systematic review protocols for ethylbenzene, uranium, vanadium and compounds (inhalation exposure), and naphthalene; and draft assessments for chloroform (inhalation) and hexavalent chromium. In addition, HERA finalized the *Office of Research and Development (ORD) Staff Handbook for Developing IRIS Assessments*⁹⁹ in December 2022.
- **Innovations in Risk Assessment:** Research under the HERA Program continues to advance assessment science and modernize its assessment infrastructure through tool and model advancements. In FY 2021, the agency released updates to the Integrated Exposure Uptake Biokinetic (IEUBK) model to support lead biokinetic modeling in children. In FY 2023, EPA anticipates finalizing 1) updates to the All-Ages Lead Model (AALM) which will include improved lead biokinetic modeling in adults and children; and 2) EPA's version of the multi-path particle dosimetry (MPPD) model and software for improved mechanistic modeling of inhalation dosimetry for particles. Continued advancements are being made to the dose-response analysis tool, Benchmark Dose Software (BMDS),¹⁰⁰ as well as critical information management databases including *Health and Environmental Research Online*¹⁰¹ and the *Health Assessment and Workplace Collaborative*,¹⁰² contributing to the improvement in the science, structure, and interoperability of these critical assessment infrastructure tools. Accompanying innovations in assessment science in FY2022, staff under the HERA Program have emphasized and coordinated training in risk assessment practice, methods, and tools for

⁹³ For more information, please see: <https://cfpub.epa.gov/ncea/isa/recordisplay.cfm?deid=354490>.

⁹⁴ For more information, please see: https://cfpub.epa.gov/ncea/iris_drafts/recordisplay.cfm?deid=350051.

⁹⁵ For more information, please see: https://cfpub.epa.gov/ncea/iris_drafts/recordisplay.cfm?deid=352767.

⁹⁶ For more information, please see: <https://www.epa.gov/iris/iris-recent-additions>.

⁹⁷ For more information, please see: <https://www.epa.gov/pprtv>.

⁹⁸ For more information, please see: https://cfpub.epa.gov/ncea/iris_drafts/recordisplay.cfm?deid=248150.

⁹⁹ For more information, please see: https://cfpub.epa.gov/ncea/iris_drafts/recordisplay.cfm?deid=356370.

¹⁰⁰ For more information, please see: <https://www.epa.gov/bmds>.

¹⁰¹ For more information, please see: <https://hero.epa.gov/hero/>.

¹⁰² For more information, please see: <https://hawcprd.epa.gov/>.

a wider audience of EPA staff and stakeholders to enhance communication, understanding, and engagement.

FY 2024 Activities and Performance Plan:

Work in this Program provides Cross-Agency Mission and Science Support and is allocated across strategic goals and objectives in the *FY 2022-2026 EPA Strategic Plan*.

In FY 2024, the HERA Program's work will focus on efforts integral to achieving EPA priorities and informing the Agency's implementation of key environmental decisions. Specifically, the program will:

- Continue developing additional assessments of perfluorinated compounds, as well as other priority chemicals identified by EPA's Water Program, Air and Radiation Program, and Land and Emergency Management Program. These assessments include ethylbenzene, hexavalent chromium, chloroform, methylmercury, mercury salts, inorganic arsenic, and formaldehyde.
- Provide assessment, methodology, and modeling support to the Chemical Safety and Pollution Prevention Program (OCSPP) on TSCA implementation for an array of chemicals, as well as support to the Air and Radiation Program, including the development of the ISA for Lead to support review of the National Ambient Air Quality Standards (NAAQS). With additional FY 2024 investment in TSCA, HERA will support a collaborative research program for new chemicals with OCSPP that is focused on modernizing the process and incorporating scientific advances in new chemical evaluations under TSCA.
- Provide high-priority PPRTV human health assessments to support the Land and Emergency Management Program on CERCLA and Resource Conservation and Recovery Act (RCRA) implementation.
- Focus on providing support for specific decision contexts through a modernized assessment infrastructure, applying state of the science tools, databases, and models in assessment development and program management. Continue to develop and apply evidence mapping to provide a better understanding of the extent and nature of evidence available to address priority needs of the Agency and its partners.
- Provide the resources and workflow to two of the five Superfund technical support centers (TSCs)¹⁰³ to provide localized and tailored technical assistance and scientific expertise on human and ecological risk assessments to states, tribes, and EPA's program and regional offices. This includes direct support in cases of emergencies and other rapid response situations.
- Apply new and alternative approaches, methods, and data to risk assessment products, and technical support to better respond to the needs of the states, tribes, and EPA's program and

¹⁰³ HERA supports the Superfund Health Risk Technical Support Center (STSC) and the Ecological Risk Assessment Support Center (ERASC). For more information on EPA's five TSCs, please see: <https://www.epa.gov/land-research/epas-technical-support-centers>.

regional offices, in cooperation with the Chemical Safety for Sustainability (CSS) Research Program.

- Conduct research to expand the identification and consideration of information on susceptibility in assessments, advance the evaluation of chemical mixtures, and improve cumulative risk assessment practices to better characterize and assess health disparities in communities with environmental justice and equity concerns.
- Provide training to staff, partners, and stakeholders on risk assessment practice, assessment tool literacy, and standard operating procedures for assessment development via easy-to-access modules.

Please note that certain activities within this program could support the Administration's Cancer Moonshot Initiative.

In addition to the activities listed above, EPA also conducts research across programs in the following areas:

- **PFAS Research:** PFAS are a class of chemicals of concern in the environment, and EPA is committed to pursuing all options to address PFAS pollution and protect human health and the environment. There are still large numbers of PFAS of high interest to stakeholders which currently have no federal published, peer-reviewed toxicity values. As described in the *PFAS Strategic Roadmap*,¹⁰⁴ within the HERA Research Program, EPA is prioritizing additional PFAS for development of peer-reviewed toxicity values. This will result in an expanded set of high-quality peer-reviewed toxicity values for use by federal, state, and tribal decision makers in making risk assessment and management decisions. In addition, EPA is identifying, reviewing, organizing, and presenting relevant health information on PFAS through systematic evidence mapping to identify data gaps, inform prioritization and hazard characterization, and facilitate human health assessments for PFAS.
- **Lead:** Childhood lead exposure continues to be one of the highest priorities for EPA. To advance the application of lead exposure and biokinetic models in EPA regulatory decisions and site assessments, agency research will enhance, evaluate, and apply lead biokinetic models used to estimate potential blood lead levels for regulatory determinations.¹⁰⁵ Additionally, the Exposure Factors Handbook¹⁰⁶ provides up-to-date data on various human factors, including soil and dust ingestion rates, used by risk assessors.

Research Planning:

EPA is built around six integrated and transdisciplinary research programs. Each of the six programs is guided by a Strategic Research Action Plan (StRAP) that reflects the research needs of Agency program and regional offices, states, and tribes, and is planned with their active

¹⁰⁴ For more information, please see EPA's PFAS Strategic Roadmap at: https://www.epa.gov/system/files/documents/2021-10/pfas-roadmap_final-508.pdf.

¹⁰⁵ For more information, please see: <https://www.epa.gov/superfund/lead-superfund-sites-software-and-users-manuals>.

¹⁰⁶ For more information, please see: <https://cfpub.epa.gov/ncea/risk/recordisplay.cfm?deid=236252>.

involvement. Each research program has developed and published the fourth generation of the StRAPs,¹⁰⁷ which will continue the practice of conducting innovative scientific research aimed at solving the problems encountered by the Agency and its stakeholders.

ORD works with various groups, including communities, to ensure the integrity and value of its research through a variety of mechanisms that include:

- EPA's Board of Scientific Counselors (BOSC)
 - ORD meets regularly with this committee, which provides advice and recommendations to ORD on technical and management issues of its research programs.
- State Engagement
 - EPA's state engagement¹⁰⁸ is designed to inform states about their role within EPA and EPA's research programs, and to better understand the science needs of state environmental and health agencies.
- Tribal Partnerships
 - Key tribal partnerships are established through the Tribal Science Program which provides a forum for the interaction between tribal and Agency representatives. These interactions identify research of mutual benefit and lead to collaborations on important tribal environmental science issues.

Performance Measure Targets:

Work under this program supports performance results in the Research: Chemical Safety for Sustainability Program under the S&T appropriation.

FY 2024 Change from FY 2023 Enacted Budget (Dollars in Thousands):

- (+\$203.0) This net change to fixed and other costs is an increase due to the recalculation of base workforce costs for existing FTE due to annual payroll increases, adjustments to provide essential workforce support, and changes to benefits costs.
- (+\$1,039.0 / +3.0 FTE) This increase supports a collaborative research program for new chemicals with OCSPP that is focused on modernizing the process and incorporating scientific advances in new chemical evaluations under TSCA. This increase in funding will lead to the development and translation of science towards effectively and efficiently informing regulatory and policy decisions by the Agency and external partners, and thus increasing access to clean and safe air, land, and water for all communities across the Nation. This investment includes \$564.0 thousand in payroll costs.

¹⁰⁷ The StRAPs are available and located here: <https://www.epa.gov/research/strategic-research-action-plans-fiscal-years-2023-2026>

¹⁰⁸ For more information, please see: <https://www.epa.gov/research/epa-research-solutions-states>.

- (+\$3,782.0 / +19.0 FTE) This net program change reflects an increase for the Health and Environmental Risk Assessment program. This increase will assist in advancing science assessments, such as IRIS, as well as analytical approaches for the application of risk assessments. This investment includes \$3.580 million in payroll costs.

Statutory Authority:

Clean Air Act §§ 103, 108, 109, and 112; Clean Water Act §§ 101(a)(6), 104, 105; Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) § 3(c)(2)(A); Safe Drinking Water Act (SDWA) § 1458; Toxic Substances Control Act (TSCA).

Research: Safe and Sustainable Water Resources

Research: Safe and Sustainable Water Resources

Program Area: Research: Safe and Sustainable Water Resources
Cross-Agency Mission and Science Support

(Dollars in Thousands)

	FY 2022 Final Actuals	FY 2023 Enacted Operating Plan	FY 2024 President's Budget	FY 2024 President's Budget v. FY 2023 Enacted Operating Plan
<i>Science & Technology</i>	<i>\$113,427</i>	<i>\$116,141</i>	<i>\$123,555</i>	<i>\$7,414</i>
Total Budget Authority	\$113,427	\$116,141	\$123,555	\$7,414
Total Workyears	361.4	358.1	378.1	20.0

Program Project Description:

The quality and availability of water, upon which human and ecosystem health and a robust economy depend, face multiple challenges. These challenges include aging water infrastructure, contaminants of existing and emerging concern, waterborne pathogens, antimicrobial resistance, harmful algal blooms and hypoxia, stormwater runoff, and diminished quality and loss of aquatic habitat. Many of these challenges can be exacerbated by the impacts of a changing climate, including greater frequency, duration and intensity of precipitation, flooding, extreme heat, wildland fire, and drought. These concerns can be more prevalent in disadvantaged and rural communities.

To address these current, emerging, and long-term water resource challenges, EPA's Safe and Sustainable Water Resources (SSWR) Research Program produces robust research and scientific analyses for decision-making and the development of innovative, practical solutions for the Agency and its partners to protect and restore America's watersheds and water infrastructure.

Efforts under the SSWR Research Program are integrated with the activities of other national research programs to address water quality and quantity concerns related to water infrastructure and coastal resilience, existing and emerging chemical and biological contaminants, stormwater runoff, and biosolids treatment and management.

Recent Accomplishments of the SSWR Research Program¹⁰⁹

- **SARS-CoV-2 Wastewater Surveillance.**

As the SARS-CoV-2 virus continued to spread and evolve, wastewater surveillance research helped detect emerging variants, such as Omicron. EPA researchers optimized methods for detecting SARS-CoV-2 and its variants in wastewater and provided analysis results to the State of Ohio to incorporate into a state dashboard used by public health officials. EPA built partnerships nationally and internationally, leading to several presentations and publications that demonstrate the effectiveness of the implemented wastewater monitoring network.

¹⁰⁹ For a more complete view of accomplishments, please see: <https://www.epa.gov/research/national-research-programs>.

- **Per- and Polyfluoroalkyl Substances (PFAS).**
 - **PFAS Treatment in Drinking Water.** EPA's Drinking Water Treatability Database was updated to include 54 PFAS chemicals from 184 sources. The database provides information on best practices and technologies for PFAS treatment in drinking water. Information on cost models for PFAS treatment in drinking water was also generated. EPA provides support to the Office of Water (OW) on PFAS treatment modeling for the development of the PFAS drinking water regulation.
 - **PFAS Treatment in Thermal Processes.** The PFAS Thermal Treatment Database (PFASTT) was brought live. The PFASTT is a publicly available database that contains more than 2,000 records of 80 sources documenting the treatability of PFAS in different media via various thermal processes.¹¹⁰
 - **PFAS Analytical Methods.**
 - EPA completed a draft method for adsorbable organic fluorine in wastewater, which was released by OW as Draft Method 1621 in April 2022. This screening method can detect PFAS chemicals for which analytical standards may not exist. SSWR Research Program researchers will support OW in validation of the method over the next year.
 - Researchers also continue to provide technical support to OW and the Department of Defense for the multi-laboratory validation of Draft Method 1633, which will be used to measure up to 40 PFAS in aqueous and solid samples.
- **Technical Support to Communities.**

EPA responded to the Benton Harbor, MI, lead (Pb) in drinking water public health emergency by designing and implementing a drinking water filter study. EPA coordinated with the Michigan Department of Environment, Great Lakes, and Energy; Benton Harbor water utility; and homeowners to collect and analyze samples. The data collected from more than 200 homes provided confidence that filters are effective in removing Pb from drinking water.
- **Climate Modeling Tools:**

EPA released updates to key stormwater tools including, Storm Water Management Model (SWMM), National Stormwater Calculator (SWC), and SWMM Climate Adjustment Tool (SWMM-CAT). SWMM 5.2 added new features for modeling the capture of street runoff by inlet drains, new pump and storage curve options, and other improvements. SWC 3.4.0 improvements include incorporating updated meteorological and cost data. SWMM-CAT 1.1 updates include incorporating 24-hour design storms and climate change data along with estimating changes in evaporation.
- **Recreational Water Quality and Public Health Protection:**

EPA published more than 40 peer-reviewed publications during the last five years supporting EPA's anticipated 2022 Five-Year Review of the 2012 Recreational Water Quality Criteria. Recent accomplishments achieved in partnership with EPA program offices and regions, other federal agencies, state authorities, and academia include:

¹¹⁰ For more information, please see: <https://pfastt.epa.gov/>.

- Implementation of quantitative polymerase chain reaction (qPCR) EPA methods targeting *E. coli* for same-day recreational water testing in the Great Lakes region.
 - Development of Standard Reference Material 2917 in collaboration with the National Institute of Standards and Technology. Release of EPA Methods 1696 and 1697 for microbial source tracking and characterization of human fecal pollution in recreational waters.
 - Performance assessment of virus-based fecal indicator methodologies and an epidemiological assessment of public health risks for children.
 - Advancement of salivary immunoassay methods for identification of waterborne infections.
- **Harmful Algal Blooms (HABs) and Nutrients:**
 - EPA released a new tool – *CyANWeb* – expanding digital platforms beyond its CyAN Android app. The new tool updates include daily imagery from two satellites, desktop and iOS access, and a video sequence option with a new fact sheet¹¹¹ to help federal, state, tribal, and local partners identify when a harmful algal bloom may be forming in waters where people swim, fish, and boat.
 - Advancement of HAB characterization, including vulnerability and early indicators.
 - Technical support and translation of research results for state agencies and other partners through training workshops, public presentations, and social media events.
 - Completion of a summary report on the Reduction of Nutrients solution-driven research project – an extensive, on-going collaboration with local stakeholders to co-design and co-implement research that will inform watershed-based solutions for nonpoint source nutrient loading to achieve nutrient reduction and water quality goals.
 - Completion of a national assessment of cumulative impacts of nutrient loading in estuaries in conjunction with acidification and climate change.
- **Improved Aquatic Resource Mapping:**

EPA scientists conducted a comprehensive review and synthesis of existing federal and state stream and wetland geospatial datasets and made recommendations to advance future efforts to map headwater streams and inland wetlands. These accomplishments will help to better characterize their contributions to essential functions, such as floodwater retention, drought protection, and water quality mediation and inclusion in implementation of the Clean Water Act.
- **Coastal Community Resilience through Blue Carbon Resources.**

EPA initiated a *Coastal Community Resilience through Blue Carbon Resources* solution-driven research project to evaluate how “Blue Carbon” or long-term carbon sequestration by wetlands, tidal marshes, and sea grasses can support coastal community adaptation to sea level rise, erosion, and flooding while improving water quality and aquatic habitat.

FY 2024 Activities and Performance Plan:

¹¹¹ For more information, please see: https://www.epa.gov/sites/default/files/2019-06/documents/cyan_app_fact_sheet_final_19jun19_508_compliant.pdf.

Work in this Program provides Cross-Agency Mission and Science Support and is allocated across strategic goals and objectives in the *FY 2022-2026 EPA Strategic Plan*.

In FY 2024, the SSWR Research Program will continue to focus on:

Water Infrastructure:

- Conduct research and provide technical support to assess the distribution, composition, and potential health risks of known and emerging chemical and biological contaminants. Protocols for sampling lead and identification of lead service lines will support the availability of safe drinking water, especially in disadvantaged communities.
- Continue work with CDC and the Ohio Network to develop appropriate methodologies and approaches for wastewater surveillance to inform public health. Assist states, communities, and utilities to address stormwater and wastewater infrastructure needs through applied models and technical assistance.

Climate Change Impacts/Resiliency:

- Integrate the impacts of climate change with research on water bodies and water infrastructure; for example, warmer temperatures and increased nutrient runoff impacts on harmful algal blooms and hypoxia, prolonged drought and extreme heat impacts on water availability and aquatic ecosystems, more frequent and intense precipitation impacts on flooding and stormwater runoff and increased severe storm events on aging water infrastructure.
- Continue the *Coastal Community Resilience through Blue Carbon Resources* solutions driven research project to evaluate coastal resilience capabilities of Blue Carbon resources (e.g., wetlands, tidal marshes, and sea grasses) and co-benefits (e.g., flood protection, improved water quality, habitat for sensitive and commercially valuable species).

Water Reuse:

- Expand the integrated assessment of cost, carbon footprint, and risk assessment of fit-for-purpose use of alternative water sources to include industrial reuse, potable end uses, and aquifer recharge. Results will inform the safe and effective implementation of new approaches to manage water resources and mitigate drought.

Harmful Algal Blooms/Nutrients:

- Expand toxicity evaluation of additional planktonic cyanobacteria cells and cyanotoxins and begin new research on benthic species that can form highly toxic algal mats.
- Develop the science needed to forecast harmful algal blooms.
- Prepare a report on the effectiveness of 16 enhanced efficiency fertilizers in reducing nutrient pollution based on greenhouse trials from the EPA and United States Department of Agriculture Challenge.
- Evaluate on-the-ground conservation practices in a watershed context by applying models.

Recreational Waters and Public Health Protection:

- Develop and characterize rapid fecal indicator, bacteriophage, microbial source tracking, and antimicrobial resistance tools for monitoring recreational waters.
- Develop human health risk and water quality predictive modeling tools to support recreational water quality criteria development and implementation.

- Conduct a performance assessment of new recreational water quality assessment tools in sub-tropical and tropical marine waters.
- Use an applied economic benefits analysis to evaluate the economic impacts of beach closures based on different water quality monitoring technologies.

Antimicrobial Resistance:

- Conduct national scale and watershed focused studies of antimicrobial resistant bacteria and associated resistance genes in surface waters to inform risk modeling of recreational and drinking water exposures. Apply similar techniques in wastewater systems to define best approaches for mitigating risks with discharges of wastewater effluents and solids.

Biosolids:

- Focus on biological and chemical contaminants and health effects by: investigating the occurrence of antimicrobial resistant *E. coli* during the treatment of Class B biosolids; assessing the human health risks of biosolids using molecular tools; developing a Voluntary Consensus Standard analytical method for the analysis of PFAS precursors in biosolids; evaluating anaerobic biotreatment of PFOA/PFAS in wastewater biosolids; and determining the applicability of molecular techniques in treatment performance evaluation.

Microplastics:

- Develop and evaluate sediment and water extraction and identification methods focusing on plastic particles smaller than one micrometer.
- Begin developing approaches to evaluate human health and ecological effects of micro- and nanoplastics.
- Collaborate with the National Institute of Standards and Technology, American Chemistry Council, and members of the National Nanotechnology Initiative to develop essential standard reference materials needed for microplastic analyses.

In addition to the activities listed above, EPA also will conduct research across programs in the following areas:

- **PFAS Research:** PFAS are a class of chemicals of growing concern in the environment, and EPA has committed to taking action to support states, tribes, and local communities to understand and manage risks associated with these chemicals. Significant challenges for risk managers include how to identify and quantify different PFAS in water, how to remove or treat PFAS when detected, and how to estimate the cost of different treatment alternatives so that utilities can make informed investment decisions. EPA will increase its PFAS research efforts, with specific emphasis on implementing the *PFAS Strategic Roadmap*.¹¹²

Within the SSWR Research Program, activities will include:

- Developing and validating methods for measuring different PFAS in water and water treatment residuals (e.g., biosolids).
- Reviewing available literature on effectiveness and cost data for different water treatment technologies applied to different PFAS.

¹¹² See EPA's PFAS Strategic Roadmap at: https://www.epa.gov/system/files/documents/2021-10/pfas-roadmap_final-508.pdf.

- Conducting pilot- and bench-scale testing of the most promising technologies to further evaluate effectiveness.
- Evaluating the bioaccumulation of PFAS in aquatic organisms and identifying the toxicity of selected PFAS (including mixtures of PFAS) to aquatic organisms.

This work is being done in collaboration with water utilities and water treatment technology suppliers. The results of this work will be posted to EPA's public Drinking Water Treatability Database and will be widely available to stakeholders.¹¹³

- **Lead:** EPA, the Centers for Disease Control and Prevention, and the American Academy of Pediatrics unanimously agree that there is no safe level of lead in a child's blood and that even low levels can result in behavior and learning problems, lower IQ, and other health effects.¹¹⁴ In response to overwhelming scientific consensus and continued public health concern, reducing childhood lead exposure is one of the highest priorities for EPA.¹¹⁵

Research focuses on:

- Establishing reliable models for estimating lead exposure from drinking water.
- Developing improved sampling techniques and strategies for identifying and characterizing lead in plumbing materials, including lead service lines.
- Developing guidance on optimizing lead mitigation strategies.
- Testing and evaluating treatment processes for removing lead from drinking water.

The overall impact of this research will be to provide information and tools that EPA, states, Tribes, utilities, and communities can use to minimize or eliminate lead exposure in drinking water.

Research Planning:

EPA research is built around six integrated and transdisciplinary research programs. Each of the six programs is guided by a Strategic Research Action Plan (StRAP) that reflects the research needs of Agency program and regional offices, states, and Tribes, and is planned with their active involvement. Each research program has developed and published their fourth generation of the StRAPs,¹¹⁶ which continue the practice of conducting innovative scientific research aimed at solving the problems encountered by the Agency and its stakeholders.

ORD works with various groups, including communities, to ensure the integrity and value of its research through a variety of mechanisms that include:

- EPA's Board of Scientific Counselors (BOSC)
 - ORD meets regularly with this committee, which provides advice and recommendations to ORD on technical and management issues of its research programs.

¹¹³ For more information, please see: <https://iaspub.epa.gov/tdb/pages/general/home.do#content>.

¹¹⁴ For more information, please see: <https://www.cdc.gov/ncch/lead/prevention/blood-lead-levels.htm>.

¹¹⁵ For more information, please see: <https://www.epa.gov/lead>.

¹¹⁶ The StRAPs are available and located here: <https://www.epa.gov/research/strategic-research-action-plans-fiscal-years-2023-2026>.

- State Engagement
 - EPA's state engagement¹¹⁷ is designed to inform states about their role within EPA and EPA's research programs, and to better understand the science needs of state environmental and health agencies.
- Tribal Partnerships
 - Key tribal partnerships are established through the Tribal Science Program which provides a forum for the interaction between tribal and Agency representatives. These interactions identify research of mutual benefit and lead to collaborations on important tribal environmental science issues.

Performance Measure Targets:

(PM RD1) Percentage of Office of Research and Development (ORD) research products meeting partner needs.

	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	Units
Target		No Target Established	77	80	81	93	94	94	Percent
Actual		77	79	80	94	94			
Numerator		171	154	120	60	77			Products
Denominator		222	196	150	64	82			

(PM RD2) Number of ORD activities related to environmental justice that involve or are designed to be applicable to tribes, states, territories, local governments, and communities.

	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	Units
Target						No Target Established	113	113	Activities
Actual						N/A			

(PM RD4) Percentage of Office of Research and Development (ORD) environmental justice-related research products meeting partner needs.

	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	Units
Target						93	94	94	Percent
Actual						100			
Numerator						1			Products
Denominator						1			

(PM RD5) Number of actions implemented for EPA scientific integrity objectives.

	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	Units
Target						No Target Established	21	21	Actions
Actual						N/A			

¹¹⁷ For more information, please see: <https://www.epa.gov/research/epa-research-solutions-states>.

FY 2024 Change from FY 2023 Enacted Budget (Dollars in Thousands):

- (+\$1,606.0) This change to fixed and other costs is an increase due to the recalculation of base workforce costs for existing FTE due to annual payroll increases, adjustments to provide essential workforce support, and changes to benefits costs. This includes support for critical agencywide infrastructure for Executive Order 14028 cybersecurity requirements, electronic discovery for FOIA and litigation support, and implementation of Trusted Vetting 2.0.
- (+\$202.0) This change to fixed and other costs is an increase due to the recalculation of laboratory fixed costs.
- (+\$5,606.0 / + 20.0 FTE) This net program change reflects an increase to the Safe and Sustainable Water Research Program. This increase will help address the challenges of aging water infrastructure, contaminants of concern, harmful algal blooms, and diminished water availability. This investment includes \$3.719 million in payroll.

Statutory Authority:

Safe Drinking Water Act (SDWA) § 1442(a)(1); Clean Water Act §§ 101(a)(6), 104, 105; Environmental Research, Development, and Demonstration Authorization Act (ERDDAA); Marine Protection, Research, and Sanctuaries Act (MPRSA) § 203; Title II of Ocean Dumping Ban Act of 1988 (ODBA); Water Resources Development Act (WRDA); Wet Weather Water Quality Act of 2000; Marine Plastic Pollution Research and Control Act of 1987 (MPPRCA); National Invasive Species Act; Coastal Zone Amendments Reauthorization Act (CZARA); Coastal Wetlands Planning, Protection and Restoration Act; Endangered Species Act (ESA); North American Wetlands Conservation Act; Federal Insecticide, Fungicide and Rodenticide Act (FIFRA); Toxic Substances Control Act (TSCA).

Research: Sustainable Communities

Research: Sustainable and Healthy Communities

Program Area: Research: Sustainable Communities

Cross-Agency Mission and Science Support

(Dollars in Thousands)

	FY 2022 Final Actuals	FY 2023 Enacted Operating Plan	FY 2024 President's Budget	FY 2024 President's Budget v. FY 2023 Enacted Operating Plan
<i>Science & Technology</i>	<i>\$133,808</i>	<i>\$137,857</i>	<i>\$146,642</i>	<i>\$8,785</i>
Leaking Underground Storage Tanks	\$312	\$341	\$351	\$10
Inland Oil Spill Programs	\$782	\$675	\$681	\$6
Hazardous Substance Superfund	\$16,562	\$16,937	\$17,364	\$427
Total Budget Authority	\$151,463	\$155,810	\$165,038	\$9,228
Total Workyears	422.1	421.8	444.3	22.5

Program Project Description:

EPA's Sustainable and Healthy Communities (SHC) Research Program supports and empowers communities to make science-based decisions to improve public and environmental health through: 1) application of technologies, methods, and other tools to expedite remediation and restoration of contaminated sites; 2) enhanced approaches to materials management practices, including the beneficial reuse or redirection of waste materials to advance waste management toward a circular economy; and 3) increased understanding of linkages between the total environment (built, natural, and social) and public and ecosystem health. These efforts support communities that are revitalizing former contaminated sites, addressing cumulative impacts (from both chemical and nonchemical stressors), and pursuing climate resilience and environmental justice (EJ) goals.

Specifically, the SHC Research Program provides state-of-the-science methods, models, tools, and technologies to the Office of Land and Emergency Management (OLEM) for use in programmatic guidance and to support EPA decision makers with in-site cleanup. These approaches will address contaminated sediments and groundwater, as well as health risks posed by vapor intrusion and chemicals of immediate concern, such as per- and polyfluoroalkyl substances (PFAS) and lead. To support prevention of future land contamination problems, researchers under the SHC program develop life cycle analysis tools and explore opportunities for beneficial reuse of materials to reduce environmental impact. Finally, efforts will also provide programs, regional partners, and local communities with research and tools they can apply to assess how they can become more resilient to and adapt to climate change. This community-oriented research is designed to revitalize communities, support the protection of children's health, and address cumulative impacts on vulnerable populations. These efforts support community sustainability and increase community resilience to natural disasters including those impacted by climate change. These efforts also build the methods and evidence base for doing cumulative impact assessment.

Recent Accomplishments of the SHC Research Program include:

Development and Application of Methods for Identifying High Exposure Lead (Pb) Locations and the Key Drivers at Those Locations (published July and Sept. 2022):¹¹⁸ SHC researchers developed and published a methodology to map lead hot spots which was used to identify high exposure locations, with an environmental justice focus. For example, the Michigan lead (Pb) paper (Xue et al., EHP) includes analyses of approximately 1.9 million children's blood lead level (BLL) test results over 11 years. Based on 2014-2016 percent elevated BLL data, census tracts were identified using two statistical methods and three available lead indices were assessed as surrogates. This research supported regulatory needs, compliance assistance and outreach, and partnerships with states on lead and environmental justice. EPA plans to use the results of this work for their lead targeting efforts with state partners. EPA, HUD, and CDC plan to collaborate on a whole-of-government blueprint supporting EPA's Lead Strategy Goal 2.

Environmental Impacts of Wasted Food – Part 1: Producing Wasted Food (published November 2021):¹¹⁹ This state-of-the-science report quantifies the environmental impact of producing, processing, and distributing food that is ultimately wasted. In addition to the environmental impacts, uneaten food contains enough calories to feed more than 150 million people each year. This product is a collaboration with the Office of Resource Conservation and Recovery (ORCR) to support the U.S. in meeting the 2030 Food Loss and Food Waste Reduction Goal, including state and local governments taking action to curb food waste. This work informs further SHC research, including development of the U.S. Environmentally-Extended Input-Output (USEEIO) model.

FY 2024 Activities and Performance Plan:

Work in this Program provides Cross-Agency Mission and Science Support and is allocated across strategic goals and objectives in the *FY 2022-2026 EPA Strategic Plan*.

The SHC Research Program will continue guiding innovative, cost-effective solutions to meet current, emerging, and long-term contaminated site clean-up and sustainable materials management challenges. This includes technical support for program and regional partners and communities as well as exploratory research that may lead to future sustainable solutions. In addition, research efforts will continue to emphasize healthy and resilient communities. Increased focus will be given to Administration priorities, such as working with communities to identify solutions to address cumulative impacts and EJ concerns, including those dealing with impacts from climate change. Other areas of increased emphasis include research addressing critical minerals and innovative strategies to reduce generation of wastes, including plastics, through recycling and reuse.

Specifically, in FY 2024 the SHC Research Program will conduct research in the following areas:

¹¹⁸ For more information, please see: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9327739/> and <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9528653/>.

¹¹⁹ For more information, please see: https://www.epa.gov/system/files/documents/2021-11/from-farm-to-kitchen-the-environmental-impacts-of-u.s.-food-waste_508-tagged.pdf.

- **Advancing Remediation and Restoration of Contaminated Sites:** EPA research under this topic will primarily focus on developing and testing remedial alternatives for treating contaminated soils, sediments, groundwater sites, vapor intrusion sites, and sites with PFAS and lead contamination; along with providing technical support to OLEM, regions, tribes, and states to translate the research into usable approaches. SHC has an increased focus on remediation of mine waste sites and potential recovery for reuse of critical minerals from contaminated sites.
- **PFAS Research:** EPA researchers will develop methods to evaluate PFAS in wastes, soils, and sediments and investigate PFAS fate and transport in the environment to support the needs of EPA partners, states, tribes, and local communities. The research will identify and characterize PFAS concentrations and distributions at contaminated sites and solid waste sites. Additionally, researchers will identify locations and source contributors to high potential human PFAS exposure for children and other populations by evaluating multimedia PFAS sources and pathways for human exposure. The SHC Research Program will also investigate approaches, methodologies, and technologies to treat, remove, destroy, and dispose of PFAS in environmental matrices. This research supports implementation of the *PFAS Strategic Roadmap*.¹²⁰
- **Lead Research:** The SHC Research Program is working to identify locations with high exposures and elevated blood lead levels, especially in children, to target lead sources for mitigation. The research program will also develop innovative methods to clean up lead at Superfund and other contaminated sites and strengthen the scientific basis of the Agency's lead-related regulatory and clean-up decisions. EPA's research in this area is essential to support ongoing Agency efforts, as well as filling in the data gaps for federal partners, tribes, states, and local communities.
- **Materials Management and Beneficial Reuse of Waste:** Research under this program aims to strengthen the scientific basis for the Nation's materials management decisions and guidance at the tribal, state, and community levels. The overall goal of this research is to increase sustainability through reducing waste and increasing support for circular economies, including supporting the implementation of the 2021 National Recycling Strategy.¹²¹ Primary research efforts will focus on: 1) developing lifecycle-based assessment tools for sustainable materials management; 2) evaluating the design, application, and use of landfills, including liner material degradation, improvements to landfill monitoring strategies, and long-term landfill impacts on human health and the environment; and 3) developing waste-management methodologies that can minimize adverse impacts to human health and the environment through proposed beneficial use and reuse. Food waste and plastics are two areas of research under this topic.
- **Integrated Systems Approach to Building Healthy and Resilient Communities:** The SHC Research Program will address the impacts of contamination, remediation, and redevelopment on the revitalization of a community. Research will address cumulative impacts of stressors and exposures, especially in overburdened and under-resourced communities. The goal of the research is to increase community resilience by reducing potential risks, promoting health, and

¹²⁰ See EPA's PFAS Strategic Roadmap at: https://www.epa.gov/system/files/documents/2021-10/pfas-roadmap_final-508.pdf.

¹²¹ See EPA's National Recycling Strategy at: <https://www.epa.gov/recyclingstrategy>.

revitalizing communities and the environment that supports them, and to increase research translation to benefit communities. Research and development under this topic will provide data and tools to support Agency and delegated programs, such as Superfund, Brownfields, Great Lakes Restoration Initiative, civil rights, enforcement, and permitting.

Please note that certain activities within this program could have implications associated with the Administration's Cancer Moonshot Initiative.

Research Planning:

EPA research is built around six integrated and transdisciplinary research programs. Each of the six programs is guided by a Strategic Research Action Plan (StRAP) that reflects the research needs of Agency program and regional offices, states, and tribes, and is planned with their active involvement. Each research program has developed and published their fourth generation of the StRAPs¹²², which continue the practice of conducting innovative scientific research aimed at solving the problems encountered by the Agency and its stakeholders.

The Office of Research and Development (ORD) works with various groups, including communities, to ensure the integrity and value of its research through a variety of mechanisms that include:

- EPA's Board of Scientific Counselors (BOSC)
 - ORD meets regularly with this committee, which provides advice and recommendations to ORD on technical and management issues of its research programs.
- State Engagement
 - EPA's state engagement¹²³ is designed to inform states about their role within EPA and EPA's research programs, and to better understand the science needs of state environmental and health agencies.
- Tribal Partnerships
 - Key tribal partnerships are established through the Tribal Science Program which provides a forum for the interaction between tribal and Agency representatives. These interactions identify research of mutual benefit and lead to collaborations on important tribal environmental science issues.

¹²² The StRAPs are available and located here: <https://www.epa.gov/research/strategic-research-action-plans-fiscal-years-2023-2026>.

¹²³ For more information, please see: <https://www.epa.gov/research/epa-research-solutions-states>.

Performance Measure Targets:

(PM RD1) Percentage of Office of Research and Development (ORD) research products meeting partner needs.

	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	Units
Target		No Target Established	77	80	81	93	94	94	Percent
Actual		77	79	80	94	94			
Numerator		171	154	120	60	77			Products
Denominator		222	196	150	64	82			

(PM RD2) Number of ORD activities related to environmental justice that involve or are designed to be applicable to tribes, states, territories, local governments, and communities.

	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	Units
Target						No Target Established	113	113	Activities
Actual						N/A			

(PM RD4) Percentage of Office of Research and Development (ORD) environmental justice-related research products meeting partner needs.

	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	Units
Target						93	94	94	Percent
Actual						100			
Numerator						1			Products
Denominator						1			

(PM RD5) Number of actions implemented for EPA scientific integrity objectives.

	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	Units
Target						No Target Established	21	21	Actions
Actual						N/A			

FY 2024 Change from FY 2023 Enacted Budget (Dollars in Thousands):

- (+\$1,315.0) This change to fixed and other costs is an increase due to the recalculation of base workforce costs for existing FTE due to annual payroll increases, adjustments to provide essential workforce support, and changes to benefits costs. It also includes support for critical agencywide infrastructure for Executive Order 14028 cybersecurity requirements, electronic discovery for FOIA and litigation support, and implementation of Trusted Vetting 2.0.
- (+\$184.0) This change to fixed and other costs is an increase due to the recalculation of laboratory fixed costs.
- (+\$6,826.0 / +20.0 FTE) This net program change reflects an increase to help address the acceleration of cleanup and return of contaminated sites to beneficial use, protection of vulnerable populations, and the revitalization of vulnerable communities. This investment includes \$4.194 million in payroll costs.

- (+\$460.0 / +2.5 FTE) This program change increases FTE to support agencywide implementation of EPA's Diversity, Equity, Inclusion, and Accessibility Strategic Plan and Evidence Act data stewardship and governance requirements. This includes \$460.0 thousand in payroll costs.

Statutory Authority:

Reorganization Plan No. 3 of 1970, 84 Stat. 2086, as amended by Pub. L. 98-80, 97 Stat. 485 (codified as Title 5 App.) (EPA's organic statute).

Water: Human Health Protection

Drinking Water Programs

Program Area: Ensure Safe Water

Goal: Ensure Clean and Safe Water for All Communities

Objective(s): Ensure Safe Drinking Water and Reliable Water Infrastructure

(Dollars in Thousands)

	FY 2022 Final Actuals	FY 2023 Enacted Operating Plan	FY 2024 President's Budget	FY 2024 President's Budget v. FY 2023 Enacted Operating Plan
Environmental Programs & Management	\$117,205	\$121,607	\$142,583	\$20,976
<i>Science & Technology</i>	<i>\$4,177</i>	<i>\$5,098</i>	<i>\$6,975</i>	<i>\$1,877</i>
Total Budget Authority	\$121,382	\$126,705	\$149,558	\$22,853
Total Workyears	473.1	539.4	554.5	15.1

Program Project Description:

EPA's Drinking Water Program is responsible for a range of activities to address drinking water contamination. The Program:

- Leads the collection of national occurrence data for unregulated contaminants in drinking water;
- Develops, evaluates, and approves analytical methods that are used to monitor drinking water contaminants accurately and reliably;
- Leads the national program under which laboratories are certified to conduct the analyses of drinking water contaminants with approved analytical methods; and
- Collaborates with states and public water systems to implement tools that optimize treatment and improve water quality by helping systems achieve compliance and maximize technical capacity while reducing operational costs.

FY 2024 Activities and Performance Plan:

Work in this program directly supports Goal 5/Objective 5.1, Ensure Safe Drinking Water and Reliable Water Infrastructure in the *FY 2022 - 2026 EPA Strategic Plan*. The Program also supports the Agency's implementation of the Infrastructure Investment and Jobs Act of 2021 (IIJA).

In FY 2024, EPA's Drinking Water Program will continue to carry out the activities listed below:

- Lead development and implementation activities for the Unregulated Contaminant Monitoring Rule (UCMR), a federal direct implementation program coordinated by EPA, as required by the Safe Drinking Water Act (SDWA).
 - The data collected pursuant to this rule support the Agency's determination of whether to establish health-based standards for unregulated drinking water contaminants to protect public health.

- In December 2021, the Agency published the final rule for the UCMR's fifth cycle (UCMR 5). EPA is managing UCMR 5 sampling through December 2025 and leading the data collection through 2026.
 - UCMR 5 is the first cycle of the Unregulated Contaminant Monitor Rule to implement the monitoring provisions of America's Water Infrastructure Act of 2018 (AWIA), which requires, subject to the availability of appropriations and adequate laboratory capacity, sampling at all small public water systems (PWSs) serving between 3,300 and 10,000 persons. AWIA also requires monitoring at a representative sample of small PWSs serving fewer than 3,300 persons. EPA implementation responsibilities have significantly expanded to address a 7.5-fold increase in the number of small-system samples as a result of AWIA.
 - EPA is responsible for managing UCMR 5 implementation at all large PWSs serving more than 10,000 persons, all small PWSs serving between 3,300 and 10,000, and a representative sample of PWS serving fewer than 3,300 persons. EPA is additionally responsible for funding the required monitoring at small PWSs. Key activities for EPA include ensuring laboratories are available to perform the required analyses, managing the field sample collection and sample analysis for small systems, and managing data reporting. In addition, EPA makes the UCMR data available to state and tribal partners and to the public.
 - By conducting sampling and data collection/reporting at all small PWSs serving between 3,300 and 10,000 persons and a representative sample of those serving fewer than 3,300 persons, the UCMR program also supports the Agency's implementation of the IJA.
 - Concurrent with managing the implementation of UCMR 5 in FY 2024, EPA will be developing the proposed rule to support the sixth cycle of UCMR (UCMR 6) monitoring, with publication of the proposal anticipated in FY 2025.
- Lead the development, revision, evaluation, and approval of analytical methods for unregulated and regulated contaminants in drinking water to assess and ensure protection of public health (*e.g.*, polyfluoroalkyl substances [PFAS]). This work supports the activities underway for the Agency's PFAS Roadmap and supports priorities identified by the EPA Council on PFAS.
 - Implement EPA's Drinking Water Laboratory Certification Program,¹²⁴ which sets direction for oversight of state, municipal, and commercial laboratories that analyze drinking water samples. EPA will conduct regional laboratory certification program reviews and deliver laboratory certification officer training courses (chemistry and microbiology) for state and regional representatives. The FY 2024 certification program oversight activities and trainings will help ensure the quality of drinking water compliance monitoring analyses.
 - Partner with states and water systems to optimize their treatment technology and distribution systems under the drinking water Area Wide Optimization Program (AWOP).¹²⁵ AWOP is a highly successful technical/compliance assistance and training program that enhances the ability of public water systems to comply with existing microbial, disinfectant, and disinfection byproduct standards, and to address distribution system integrity and water quality issues

¹²⁴ For more information, please see: <https://www.epa.gov/dwlabcert>.

¹²⁵ For more information, please see: <https://www.epa.gov/sdwa/optimization-program-drinking-water-systems>.

caused by the source, aging infrastructure, or other concerns. During FY 2024, EPA expects to work with states and tribes to expand efforts to train and assist systems, including those in disadvantaged and tribal communities. This effort includes identifying performance limiting factors at public water systems and developing and applying tailored tools to help them overcome operational challenges, achieve performance and optimization levels, and address health-based compliance challenges. The technical assistance provided by AWOP can be instrumental in supporting public water systems with limited capacity to effectively address drinking water quality issues. The AWOP program also supports the Agency's implementation of IJIA.

Performance Measure Targets:

Work under this program supports Safe Drinking Water Act implementation and compliance and requirements in the Drinking Water State Revolving Fund and Categorical Grant: Public Water System Supervision Programs under the STAG appropriation to support safe drinking water for the Nation.

FY 2024 Change from FY 2023 Enacted Budget (Dollars in Thousands):

- (+\$188.0) This change to fixed and other costs is an increase due to the recalculation of base workforce costs for existing FTE due to annual payroll increases, adjustments to provide essential workforce support, and changes to benefits costs. This change also includes supporting critical Agencywide infrastructure for Executive Order 14028 cybersecurity requirements, electronic discovery for FOIA and litigation support, and implementation of Trusted Vetting 2.0.
- (+\$1,689.0 / +4.0 FTE) This change increases FTE to support Agencywide implementation of EPA's Diversity, Equity, Inclusion, and Accessibility Strategic Plan and Evidence Act data stewardship and governance requirements. This increase of resources and FTE supports regulatory analysis, development and training, and technical assistance for state, tribal, and local communities to address drinking water contaminants (including Lead and PFAS) in their efforts to ensure safe and affordable drinking water. This investment also includes \$759.0 thousand in payroll costs.

Statutory Authority:

SDWA.

Congressional Priorities

Congressional Priorities

Program Area: Clean and Safe Water Technical Assistance Grants

Goal: Ensure Clean and Safe Water for All Communities

Objective(s): Ensure Safe Drinking Water and Reliable Water Infrastructure

Cross-Agency Mission and Science Support

(Dollars in Thousands)

	FY 2022 Final Actuals	FY 2023 Enacted Operating Plan	FY 2024 President's Budget	FY 2024 President's Budget v. FY 2023 Enacted Operating Plan
Environmental Programs & Management	\$21,700	\$30,700	\$0	-\$30,700
<i>Science & Technology</i>	<i>\$7,492</i>	<i>\$30,751</i>	<i>\$0</i>	<i>-\$30,751</i>
Total Budget Authority	\$29,192	\$61,451	\$0	-\$61,451

Program Project Description:

In FY 2023, Congress appropriated \$30.8 million in the Science and Technology appropriation to Congressional priorities including \$9.5 million for extramural grants. EPA was instructed by Congress to award grants on a competitive basis, independent of the Science to Achieve Results (STAR) Program, and to give priority to not-for-profit organizations that: 1) conduct activities that are national in scope; 2) can provide a 25 percent match, including in-kind contributions; and 3) often partner with the Agency. Additionally, Congress provided \$8.0 million to fund research that will help farmers, ranchers, and rural communities manage PFAS impacts in agricultural settings and communities as well as \$13.3 million on other Congressionally Directed Projects.

FY 2024 Activities and Performance Plan:

There are no resources for this Program in FY 2024.

Performance Measure Targets:

EPA's FY 2024 Annual Performance Plan does not include annual performance goals specific to this program.

FY 2024 Change from FY 2023 Enacted Budget (Dollars in Thousands):

- (-\$30,751.0) Resources are proposed for elimination for this program in FY 2024. The goals of this Program can be accomplished through core statutory programs.

Statutory Authority:

Clean Air Act (CAA) 42 U.S.C. 7401 et seq. Title 1, Part A – Sec. 103 (a) and (d) and Sec. 104 (c); CAA 42 U.S.C. 7402(b) Section 102; CAA 42 U.S.C. 7403(b)(2) Section 103(b)(2); Clinger Cohen Act, 40 U.S.C. 11318; Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (Superfund, 1980) Section 209(a) of Public Law 99-499; Children's

Health Act; Clean Water Act (CWA), Sec. 101 - 121; Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA); Coastal Zone Amendments Reauthorization Act (CZARA); Coastal Zone Management Act (CZMA) 16 U.S.C. 1451 - Section 302; Economy Act, 31 U.S.C. 1535; Energy Independence and Security Act (EISA), Title II Subtitle B; Environmental Research, Development, and Demonstration Authorization Act (ERDDAA), 33 U.S.C. 1251 – Section 2(a); Endangered Species Act (ESA), 16 U.S.C. 1531 - Section 2; Federal Food, Drug, and Cosmetic Act (FFDCA), 21 U.S.C. Sec. 346; Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) (7 U.S.C. s/s 136 et seq. (1996), as amended), Sec. 3(c)(2)(A); Food Quality Protection Act (FQPA) PL 104-170; Intergovernmental Cooperation Act, 31 U.S.C. 6502; Marine Protection, Research, and Sanctuaries Act (MPRSA) Sec. 203, 33 U.S.C. 1443; North American Wetlands Conservation Act (NAWCA); NCPA; National Environmental Education Act, 20 U.S.C. 5503(b)(3) and (b)(11); National Environmental Protection Act (NEPA) of 1969, Section 102; National Invasive Species Act (NISA); Ocean Dumping Ban Act of 1988 (ODBA) Title II; PPA, 42 U.S.C. 13103; Resource Conservation and Recovery Act (RCRA); Safe Drinking Water Act (SDWA) (1996) 42 U.S.C. Section 300j-18; SDWA Part E, Sec. 1442 (a)(1); Toxic Substances Control Act (TSCA), Section 10, 15, 26, U.S.C. 2609; U.S. Global Change Research Act (USGCRA) 15 U.S.C. 2921; Water Resources Development Act (WRDA); Water Resources Research Act (WRRRA); and Wet Weather Water Quality Act of 2000 (WWWQA).