UNITED STATES COURT OF APPEALS
FOR THE SIXTH CIRCUIT

OHIO CHEMISTRY TECHNOLOGY COUNCIL, Petitioner, v. U.S. ENVIRONMENTAL PROTECTION AGENCY, Respondent.	)	No. _____ Agency Docket No. EPA-HQ-OPPT-2020-0642

PETITION FOR REVIEW

Pursuant to Section 19 of the Toxic Substances Control Act (15 U.S.C. 2618), the Ohio Chemistry Technology Council ("OCTC") hereby petitions this Court to review and set aside certain provisions of the final rule of the U.S. Environmental Protection agency ("EPA") entitled "Trichloroethylene (TCE); Regulation Under the Toxic Substances Control Act (TSCA)," which was published in the Federal Register at 89 Fed. Reg. 102,568 on December 17, 2024. The final rule was issued for purposes of judicial review on December 31, 2024. *See* 40 C.F.R. § 23.5(a); 15 U.S.C. § 2618(a)(2) (citing 28 U.S.C. § 2112). A copy of EPA's final rule is attached as Exhibit A.

Dated: January 8, 2025

Respectfully submitted,

/s/ Robert J. Karl
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CERTIFICATE OF SERVICE

Pursuant to 6 Cir. R. 25(f)(2) and 40 C.F.R. § 23.12(a), on this date, I hereby certify that I will cause to be delivered, via certified U.S. mail, a copy of the foregoing Petition for Review to the following:

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U.S. Environmental Protection Agency
Mail Code 1101A
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Washington, D.C. 20460

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/s/ Robert J. Karl
Robert J. Karl

Dated: January 8, 2025

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 751

[EPA–HQ–OPPT–2020–0642; FRL–8317–02–OCSPP]

RIN 2070–AK83

Trichloroethylene (TCE); Regulation Under the Toxic Substances Control Act (TSCA)

AGENCY: Environmental Protection Agency (EPA).

ACTION: Final rule.

SUMMARY: The Environmental Protection Agency (EPA or Agency) is finalizing a rule to address the unreasonable risk of injury to health presented by trichloroethylene (TCE) under its conditions of use. TSCA requires that EPA address by rule any unreasonable risk of injury to health or the environment identified in a TSCA risk evaluation and apply requirements to the extent necessary so that the chemical no longer presents unreasonable risk. EPA's final rule will, among other things, prevent serious illness associated with uncontrolled exposures to the chemical by preventing consumer access to the chemical, restricting the industrial and commercial use of the chemical while also allowing for a reasonable transition period with interim worker protections in place where an industrial and commercial use of the chemical is being prohibited, and provide time-limited exemptions for critical or essential uses of TCE for which no technically and economically feasible safer alternatives are available.

DATES: This final rule is effective on January 16, 2025.

ADDRESSES: The docket for this action, identified by docket identification (ID) number EPA–HQ–OPPT–2020–0642, is available online at *https://www.regulations.gov*. Additional information about dockets generally, along with instructions for visiting the docket in-person, is available at *https://www.epa.gov/dockets*.

FOR FURTHER INFORMATION CONTACT:
For technical information: Gabriela Rossner, Existing Chemicals Risk Management Division, Office of Pollution Prevention and Toxics, Environmental Protection Agency, 1200 Pennsylvania Ave. NW, Washington, DC 20460–0001; telephone number: (202) 565–2426; email address: *TCE.TSCA@epa.gov*.

For general information: The TSCA-Hotline, ABVI-Goodwill, 422 South Clinton Ave., Rochester, NY 14620; telephone number: (202) 554–1404; email address: *TSCA-Hotline@epa.gov*.

SUPPLEMENTARY INFORMATION:

I. Executive Summary

A. Does this action apply to me?

1. General Applicability

This action applies to you if you manufacture, process, distribute in commerce, use, or dispose of TCE or products containing TCE. TSCA section 3(9) defines the term "manufacture" to mean "to import into the customs territory of the United States (as defined in general note 2 of the Harmonized Tariff Schedule of the United States), produce, or manufacture." Therefore, unless expressly stated otherwise, importers of TCE are subject to any provisions regulating manufacture of TCE (see also Unit I.A.2.). The following list of North American Industrial Classification System (NAICS) codes is not intended to be exhaustive, but rather provides a guide to help readers determine whether this document applies to them. Potentially affected entities include:

- Crude Petroleum Extraction (NAICS code 211120);
- Fossil Fuel Electric Power Generation (NAICS code 221112);
- Other Electric Power Generation (NAICS code 221118);
- Broadwoven Fabric Mills (NAICS code 313210);
- Narrow Fabric Mills and Schiffli Machine Embroidery (NAICS code 313220);
- Nonwoven Fabric Mills (NAICS code 313230);
- Textile and Fabric Finishing Mills (NAICS code 313310);
- Fabric Coating Mills (NAICS code 313320);
- Wood Window and Door Manufacturing (NAICS code 321911);
- Prefabricated Wood Building Manufacturing (NAICS code 321992);
- Paper Bag and Coated and Treated Paper Manufacturing (NAICS code 322220);
- Petroleum Refineries (NAICS code 324110);
- All Other Petroleum and Coal Products Manufacturing (NAICS code 324199);
- Petrochemical Manufacturing (NAICS code 325110);
- Other Basic Inorganic Chemical Manufacturing (NAICS code 325180);
- Ethyl Alcohol Manufacturing (NAICS code 325193);
- All Other Basic Organic Chemical Manufacturing (NAICS code 325199);
- Plastics Material and Resin Manufacturing (NAICS code 325211);
- Medicinal and Botanical Manufacturing (NAICS code 325411);
- Pharmaceutical Preparation Manufacturing (NAICS code 325412);
- Paint and Coating Manufacturing (NAICS code 325510);
- Adhesive Manufacturing (NAICS code 325520);
- Polish and Other Sanitation Good Manufacturing (NAICS code 325612);
- Photographic Film, Paper, Plate and Chemical Manufacturing (NAICS code 325992);
- All Other Miscellaneous Chemical Product and Preparation Manufacturing (NAICS code 325998);
- Polystyrene Foam Product Manufacturing (NAICS code 326140);
- Urethane and Other Foam Product (except Polystyrene) Manufacturing (NAICS code 326150);
- Tire Manufacturing (except Retreading) (NAICS code 326211);
- Tire Retreading (NAICS code 326212);
- Rubber and Plastics Hoses and Belting Manufacturing (NAICS code 326220);
- Rubber Product Manufacturing for Mechanical Use (NAICS code 326291);
- All Other Rubber Product Manufacturing (NAICS code 326299);
- Pottery, Ceramics, and Plumbing Fixture Manufacturing (NAICS code 327110);
- Gypsum Product Manufacturing (NAICS code 327420);
- Iron and Steel Mills and Ferroalloy Manufacturing (NAICS code 331110);
- Iron and Steel Pipe and Tube Manufacturing from Purchased Steel (NAICS code 331210);
- Rolled Steel Shape Manufacturing (NAICS code 331221);
- Steel Wire Drawing (NAICS code 331222);
- Nonferrous Metal (except Aluminum) Smelting and Refining (NAICS code 331410);
- Copper Rolling, Drawing, Extruding, and Alloying (NAICS code 331420);
- Nonferrous Metal (except Copper and Aluminum) Rolling, Drawing and Extruding (NAICS code 331491);
- Secondary Smelting, Refining, and Alloying of Nonferrous Metal (except Copper and Aluminum) (NAICS code 331492);
- Nonferrous Metal Die-Casting Foundries (NAICS code 331523);
- Iron and Steel Forging (NAICS code 332111);
- Nonferrous Forging (NAICS code 332112);
- Custom Roll Forming (NAICS code 332114);
- Powder Metallurgy Part Manufacturing (NAICS code 332117);
- Metal Crown, Closure, and Other Metal Stamping (except Automotive) (NAICS code 332119);

- Metal Kitchen Cookware, Utensil, Cutlery, and Flatware (except Precious) Manufacturing (NAICS code 332215);
- Saw Blade and Handtool Manufacturing (NAICS code 332216);
- Metal Window and Door Manufacturing (NAICS code 332321);
- Sheet Metal Work Manufacturing (NAICS code 332322);
- Ornamental and Architectural Metal Work Manufacturing (NAICS code 332323);
- Power Boiler and Heat Exchanger Manufacturing (NAICS code 332410);
- Metal Tank (Heavy Gauge) Manufacturing (NAICS code 332420);
- Metal Can Manufacturing (NAICS code 332431);
- Other Metal Container Manufacturing (NAICS code 332439);
- Hardware Manufacturing (NAICS code 332510);
- Spring Manufacturing (NAICS code 332613);
- Other Fabricated Wire Product Manufacturing (NAICS code 332618);
- Machine Shops (NAICS code 332710);
- Precision Turned Product Manufacturing (NAICS code 332721);
- Bolt, Nut, Screw, Rivet and Washer Manufacturing (NAICS code 332722);
- Metal Heat Treating (NAICS code 332811);
- Metal Coating, Engraving (except Jewelry and Silverware), and Allied Services to Manufacturers (NAICS code 332812);
- Electroplating, Plating, Polishing, Anodizing and Coloring (NAICS code 332813);
- Industrial Valve Manufacturing (NAICS code 332911);
- Fluid Power Valve and Hose Fitting Manufacturing (NAICS code 332912);
- Plumbing Fixture Fitting and Trim Manufacturing (NAICS code 332913);
- Other Metal Valve and Pipe Fitting Manufacturing (NAICS code 332919);
- Ball and Roller Bearing Manufacturing (NAICS code 332991);
- Small Arms Ammunition Manufacturing (NAICS code 332992);
- Ammunition (except Small Arms) Manufacturing (NAICS code 332993);
- Small Arms, Ordnance, and Ordnance Accessories Manufacturing (NAICS code 332994);
- Fabricated Pipe and Pipe Fitting Manufacturing (NAICS code 332996);
- All Other Miscellaneous Fabricated Metal Product Manufacturing (NAICS code 332999);
- Farm Machinery and Equipment Manufacturing (NAICS code 333111);
- Lawn and Garden Tractor and Home Lawn and Garden Equipment Manufacturing (NAICS code 333112);
- Construction Machinery Manufacturing (NAICS code 333120);
- Mining Machinery and Equipment Manufacturing (NAICS code 333131);
- Oil and Gas Field Machinery and Equipment Manufacturing (NAICS code 333132);
- Food Product Machinery Manufacturing (NAICS code 333241);
- Semiconductor Machinery Manufacturing (NAICS code 333242);
- Sawmill, Woodworking, and Paper Machinery Manufacturing (NAICS code 333243);
- Printing Machinery and Equipment Manufacturing (NAICS code 333244);
- Other Industrial Machinery Manufacturing (NAICS code 333249);
- Optical Instrument and Lens Manufacturing (NAICS code 333314);
- Photographic and Photocopying Equipment Manufacturing (NAICS code 333316);
- Other Commercial and Service Industry Machinery Manufacturing (NAICS code 333318);
- Industrial and Commercial Fan and Blower and Air Purification Equipment Manufacturing (NAICS code 333413);
- Heating Equipment (except Warm Air Furnaces) Manufacturing (NAICS code 333414);
- Air-Conditioning and Warm Air Heating Equipment and Commercial and Industrial Refrigeration Equipment Manufacturing (NAICS code 333415);
- Industrial Mold Manufacturing (NAICS code 333511);
- Special Die and Tool, Die Set, Jig and Fixture Manufacturing (NAICS code 333514);
- Cutting Tool and Machine Tool Accessory Manufacturing (NAICS code 333515);
- Machine Tool Manufacturing (NAICS code 333517);
- Rolling Mill and Other Metalworking Machinery Manufacturing (NAICS code 333519);
- Turbine and Turbine Generator Set Unit Manufacturing (NAICS code 333611);
- Speed Changer, Industrial High-Speed Drive and Gear Manufacturing (NAICS code 333612);
- Mechanical Power Transmission Equipment Manufacturing (NAICS code 333613);
- Other Engine Equipment Manufacturing (NAICS code 333618);
- Air and Gas Compressor Manufacturing (NAICS code 333912);
- Measuring, Dispensing, and Other Pumping Equipment Manufacturing (NAICS code 333914);
- Elevator and Moving Stairway Manufacturing (NAICS code 333921);
- Conveyor and Conveying Equipment Manufacturing (NAICS code 333922);
- Overhead Traveling Crane, Hoist and Monorail System Manufacturing (NAICS code 333923);
- Industrial Truck, Tractor, Trailer and Stacker Machinery Manufacturing (NAICS code 333924);
- Power-Driven Hand Tool Manufacturing (NAICS code 333991);
- Welding and Soldering Equipment Manufacturing (NAICS code 333992);
- Packaging Machinery Manufacturing (NAICS code 333993);
- Industrial Process Furnace and Oven Manufacturing (NAICS code 333994);
- Fluid Power Cylinder and Actuator Manufacturing (NAICS code 333995);
- Fluid Powor Pump and Motor Manufacturing (NAICS code 333996);
- Scale and Balance Manufacturing (NAICS code 333997);
- All Other Miscellaneous General Purpose Machinery Manufacturing (NAICS code 333999);
- Audio and Video Equipment Manufacturing (NAICS code 334310);
- Capacitor, Resistor, Coil, Transformer, and Other Inductor Manufacturing (NAICS code 334416);
- Electronic Connector Manufacturing (NAICS code 334417);
- Printed Circuit Assembly (Electronic Assembly) Manufacturing (NAICS code 334418);
- Other Electronic Component Manufacturing (NAICS code 334419);
- Search, Detection, Navigation, Guidance, Aeronautical, and Nautical System and Instrument Manufacturing (NAICS code 334511);
- Automatic Environmental Control Manufacturing for Residential, Commercial and Appliance Use (NAICS code 334512);
- Instruments and Related Products Manufacturing for Measuring, Displaying, and Controlling Industrial Process Variables (NAICS code 334513);
- Instrument Manufacturing for Measuring and Testing Electricity and Electrical Signals (NAICS code 334515);
- Electric Lamp Bulb and Part Manufacturing (NAICS code 335110);
- Residential Electric Lighting Fixture Manufacturing (NAICS code 335121);
- Commercial, Industrial and Institutional Electric Lighting Fixture Manufacturing (NAICS code 335122);
- Other Lighting Equipment Manufacturing (NAICS code 335129);
- Major Household Appliance Manufacturing (NAICS code 335220);
- Power, Distribution and Specialty Transformer Manufacturing (NAICS code 335311);
- Motor and Generator Manufacturing (NAICS code 335312);
- Switchgear and Switchboard Apparatus Manufacturing (NAICS code 335313);

- Relay and Industrial Control Manufacturing (NAICS code 335314);
- Storage Battery Manufacturing (NAICS code 335911);
- Fiber Optic Cable Manufacturing (NAICS code 335921);
- Current-Carrying Wiring Device Manufacturing (NAICS code 335931);
- Carbon and Graphite Product Manufacturing (NAICS code 335991);
- Automobile Manufacturing (NAICS code 336111);
- Light Truck and Utility Vehicle Manufacturing (NAICS code 336112);
- Heavy Duty Truck Manufacturing (NAICS code 336120);
- Motor Vehicle Body Manufacturing (NAICS code 336211);
- Truck Trailer Manufacturing (NAICS code 336212);
- Motor Home Manufacturing (NAICS code 336213);
- Travel Trailer and Camper Manufacturing (NAICS code 336214);
- Motor Vehicle Gasoline Engine and Engine Parts Manufacturing (NAICS code 336310);
- Motor Vehicle Electrical and Electronic Equipment Manufacturing (NAICS code 336320);
- Motor Vehicle Steering and Suspension Components (except Spring) Manufacturing (NAICS code 336330);
- Motor Vehicle Brake System Manufacturing (NAICS code 336340);
- Motor Vehicle Transmission and Power Train Parts Manufacturing (NAICS code 336350);
- Motor Vehicle Seating and Interior Trim Manufacturing (NAICS code 336360);
- Motor Vehicle Metal Stamping (NAICS code 336370);
- Other Motor Vehicle Parts Manufacturing (NAICS code 336390);
- Aircraft Manufacturing (NAICS code 336411);
- Aircraft Engine and Engine Parts Manufacturing (NAICS code 336412);
- Other Aircraft Part and Auxiliary Equipment Manufacturing (NAICS code 336413);
- Guided Missile and Space Vehicle Manufacturing (NAICS code 336414);
- Guided Missile and Space Vehicle Propulsion Unit and Propulsion Unit Parts Manufacturing (NAICS code 336415);
- Other Guided Missile and Space Vehicle Parts and Auxiliary Equipment Manufacturing (NAICS code 336419);
- Railroad Rolling Stock Manufacturing (NAICS code 336510);
- Ship Building and Repairing (NAICS code 336611);
- Boat Building (NAICS code 336612);
- Motorcycle, Bicycle and Parts Manufacturing (NAICS code 336991);
- Military Armored Vehicle, Tank and Tank Component Manufacturing (NAICS code 336992);
- All Other Transportation Equipment Manufacturing (NAICS code 336999);
- Wood Kitchen Cabinet and Counter Top Manufacturing (NAICS code 337110);
- Upholstered Household Furniture Manufacturing (NAICS code 337121);
- Nonupholstered Wood Household Furniture Manufacturing (NAICS code 337122);
- Metal Household Furniture Manufacturing (NAICS code 337124);
- Institutional Furniture Manufacturing (NAICS code 337127);
- Wood Office Furniture Manufacturing (NAICS code 337211);
- Surgical Appliance and Supplies Manufacturing (NAICS code 339113);
- Dental Equipment and Supplies Manufacturing (NAICS code 339114);
- Jewelry and Silverware Manufacturing (NAICS code 339910);
- Sporting and Athletic Goods Manufacturing (NAICS code 339920);
- Gasket, Packing, and Sealing Device Manufacturing (NAICS code 339991);
- Fastener, Button, Needle and Pin Manufacturing (NAICS code 339993);
- All Other Miscellaneous Manufacturing (NAICS code 339999);
- Metal Service Centers and Other Metal Merchant Wholesalers (NAICS code 423510);
- Industrial Supplies Merchant Wholesalers (NAICS code 423510);
- Other Chemical and Allied Products Merchant Wholesalers (NAICS code 424690);
- Paint, Varnish, and Supplies Merchant Wholesalers (NAICS code 424950);
- New Car Dealers (NAICS code 441110);
- Used Car Dealers (NAICS code 441120);
- Sporting Goods Stores (NAICS code 451110);
- Scheduled Passenger Air Transportation (NAICS code 481111);
- Other Support Activities for Air Transportation (NAICS code 481111);
- Other Warehousing and Storage (NAICS code 493190);
- Motion Picture and Video Production (NAICS code 512110);
- Other Financial Vehicles (NAICS code 525990);
- Research and Development in the Physical, Engineering, and Life Sciences (except Nanotechnology and Biotechnology) (NAICS code 541715);
- Research and Development in the Social Sciences and Humanities (NAICS code 541720);
- Offices of Other Holding Companies (NAICS code 551112);
- Carpet and Upholstery Cleaning Services (NAICS code 561740);
- Hazardous Waste Treatment and Disposal (NAICS code 562211);
- Solid Waste Landfill (NAICS code 562212);
- Materials Recovery Facilities (NAICS code 562920);
- Junior Colleges (NAICS code 611210);
- Colleges, Universities and Professional Schools (NAICS code 611310);
- General Automotive Repair (NAICS code 811111);
- Automotive Exhaust System Repair (NAICS code 811112);
- Automotive Transmission Repair (NAICS code 811113);
- Other Automotive Mechanical and Electrical Repair and Maintenance (NAICS code 811118);
- Automotive Body, Paint and Interior Repair and Maintenance (NAICS code 811121);
- Automotive Glass Replacement Shops (NAICS code 811122);
- Automotive Oil Change and Lubrication Shops (NAICS code 811191);
- All Other Automotive Repair and Maintenance (NAICS code 811198);
- Consumer Electronics Repair and Maintenance (NAICS code 811211);
- Computer and Office Machine Repair and Maintenance (NAICS code 811212);
- Communication Equipment Repair and Maintenance (NAICS code 811213);
- Other Electronic and Precision Equipment Repair and Maintenance (NAICS code 811219);
- Commercial and Industrial Machinery and Equipment (except Automotive and Electronic) Repair and Maintenance (NAICS code 811310);
- Home and Garden Equipment Repair and Maintenance (NAICS code 811411);
- Other Personal and Household Goods Repair and Maintenance (NAICS code 811490);
- Coin-Operated Laundries and Drycleaners (NAICS code 812310);
- Drycleaning and Laundry Services (except Coin-Operated) (NAICS code 812320); and
- Industrial Launderers (NAICS code 812332).

2. Applicability to Importers and Exporters

This action may also affect certain entities subject to import certification and export notification requirements under TSCA (*https://www.epa.gov/tsca-import-export-requirements*). Persons who import any chemical substance in bulk form, as part of a mixture, or as

part of an article (if required by rule) are subject to TSCA section 13 (15 U.S.C. 2612) import certification requirements and the corresponding regulations at 19 CFR 12.118 through 12.127 (see also 19 CFR 127.28(i)). Those persons must certify that the shipment of the chemical substance complies with all applicable rules and orders under TSCA (see 19 CFR 12.121). The EPA policy in support of import certification appears at 40 CFR part 707, subpart B.

In addition, any persons who export or intend to export a chemical substance that is the subject of this final rule are subject to the export notification provisions of TSCA section 12(b) (15 U.S.C. 2611(b)) and must comply with the export notification requirements in 40 CFR part 707, subpart D. Any person who exports or intends to export TCE must comply with the export notification requirements in 40 CFR part 707, subpart D.

If you have any questions regarding the applicability of this action to a particular entity, consult the technical information contact listed under **FOR FURTHER INFORMATION CONTACT**.

B. What is the Agency's authority for taking this action?

Under TSCA section 6(a) (15 U.S.C. 2605(a)), if the Agency determines through a TSCA section 6(b) risk evaluation that a chemical substance presents an unreasonable risk of injury to health or the environment, EPA must by rule apply one or more requirements listed in TSCA section 6(a) to the extent necessary so that the chemical substance or mixture no longer presents such risk.

C. What action is the Agency taking?

Pursuant to TSCA section 6(b), EPA determined in 2023 that TCE presents an unreasonable risk of injury to health, without consideration of costs or other non-risk factors, including an unreasonable risk to potentially exposed or susceptible subpopulations (PESS) identified by EPA as relevant to the 2020 Risk Evaluation for TCE under the conditions of use (Refs. 1, 2). A description of the conditions of use that contribute to EPA's determination that TCE presents an unreasonable risk is in III.B.1. of the proposed rule (88 FR 74712, October 31, 2023 (FRL–8317–01–OCSPP), with a summary in Unit II.C.4 of this final rule. Accordingly, to address the unreasonable risk, EPA is issuing this final rule to:

(i) Prohibit the manufacture (including import), processing, and distribution in commerce of TCE for all uses (including all consumer uses (see Unit IV.B.2.)), as described in Unit IV.B., with longer compliance timeframes for manufacture, processing, and distribution in commerce related to certain industrial and commercial uses;

(ii) Prohibit the industrial and commercial use of TCE, as described in Unit IV.B.1., with longer compliance timeframes for certain uses;

(iii) Prohibit the manufacture (including import) and processing of TCE as an intermediate for the manufacturing of hydrofluorocarbon 134a (HFC–134a), following an 8.5-year phase-out, as described in Unit IV.B.3.;

(iv) Prohibit the industrial and commercial use of TCE as a solvent for closed-loop batch vapor degreasing for rayon fabric scouring for end use in rocket booster nozzle production by Federal agencies and their contractors, following a 10-year phase-out, outlined in Unit IV.B.4.;

(v) Prohibit the manufacture (including import), processing, distribution in commerce, and use of TCE as a laboratory chemical for asphalt testing and recovery, following a 10-year phase-out, outlined in Unit IV.B.5.;

(vi) Prohibit the manufacture (including import), processing, distribution in commerce, and industrial and commercial use of TCE as a solvent in batch vapor degreasing for essential aerospace parts and components and narrow tubing used in medical devices, following a 7-year TSCA section 6(g) exemption, outlined in Unit IV.G.1.;

(vii) Prohibit the manufacture (including import), processing, distribution in commerce, and industrial and commercial use of TCE as a solvent in closed loop vapor degreasing necessary for rocket engine cleaning by Federal agencies and their contractors, following a 7-year TSCA section 6(g) exemption, outlined in Unit IV.G.2.;

(viii) For vessels of the Armed Forces and their systems, and in the maintenance, fabrication, and sustainment for and of such vessels and systems, prohibit the industrial and commercial use of TCE as: potting compounds for naval electronic systems and equipment; sealing compounds for high and ultra-high vacuum systems; bonding compounds for materials testing and maintenance of underwater systems and bonding of nonmetallic materials; and cleaning agents to satisfy cleaning requirements (which includes degreasing using wipes, sprays, solvents and vapor degreasing) for: materials and components required for military ordnance testing; temporary resin repairs in vessel spaces where welding is not authorized; ensuring polyurethane adhesion for electronic systems and equipment repair and installation of elastomeric materials; various naval combat systems, radars, sensors, equipment; fabrication and prototyping processes to remove coolant and other residue from machine parts; machined part fabrications for naval systems; installation of topside rubber tile material aboard vessels; and vapor degreasing required for substrate surface preparation prior to electroplating processes, following a 10-year TSCA section 6(g) exemption, outlined in Unit IV.G.3.;

(ix) Prohibit the emergency industrial and commercial use of TCE in furtherance of the NASA mission for specific conditions which are critical or essential and for which no technically and economically feasible safer alternative is available, following a 10-year TSCA section 6(g) exemption, outlined in Unit IV.G.4.;

(x) Prohibit the manufacture (including import), processing, distribution in commerce, disposal, and use of TCE as a processing aid for manufacturing battery separators for lead acid batteries, following a 20-year TSCA section 6(g) exemption, as described in Unit IV.G.5.;

(xi) Prohibit the manufacture (including import), processing, distribution in commerce, disposal, and use of TCE as a processing aid for manufacturing specialty polymeric microporous sheet materials following a 15-year TSCA section 6(g) exemption, as described in Unit IV.G.6.;

(xii) Prohibit the manufacture (including import), processing, distribution in commerce, and use of TCE as a laboratory chemical for essential laboratory activities and some research and development activities, following a 50-year TSCA section 6(g) exemption, as described in Unit IV.G.7.;

(xiii) Require strict workplace controls to limit exposure to TCE, including compliance with a TCE workplace chemical protection program (WCPP), which would include requirements for an interim existing chemical exposure limit (ECEL) revised from the proposed rule, as well as dermal protection, for conditions of use with long term phase-outs or time-limited exemptions under TSCA section 6(g), as described in Unit IV.C., or prescriptive workplace controls, as described in Unit IV.D.;

(xiv) Prohibit the disposal of TCE to industrial pre-treatment, industrial treatment, or publicly owned treatment works, through a phaseout allowing for longer timeframes for disposal necessary for certain industrial and commercial uses as described in Unit IV.B.6., along with a 50-year TSCA section 6(g)

exemption for disposal for cleanup projects before prohibition, as described in Unit IV.G.8., and interim requirements for wastewater worker protection, as described in Unit IV.E.; and

(xv) Establish recordkeeping and downstream notification requirements, as described in Unit IV.F.

EPA notes that all TSCA conditions of use of TCE are subject to this final rule. "Conditions of use" is defined in TSCA section 3(4) to mean the circumstances, as determined by EPA, under which a chemical substance is intended, known, or reasonably foreseen to be manufactured, processed, distributed in commerce, used, or disposed of.

D. Why is the Agency taking this action?

Under TSCA section 6(a), "[i]f the Administrator determines in accordance with subsection (b)(4)(A) that the manufacture, processing, distribution in commerce, use or disposal of a chemical substance or mixture, or that any combination of such activities, presents an unreasonable risk of injury to health or the environment, the Administrator shall by rule . . . apply one or more of the [section 6(a)] requirements to such substance or mixture to the extent necessary so that the chemical substance no longer presents such risk." TCE was the subject of a risk evaluation under TSCA section 6(b)(4)(A) that was issued in November 2020 (Ref. 1). In addition, EPA issued a revised unreasonable risk determination for TCE in January 2023 (Ref. 2), determining that TCE, as a whole chemical substance, presents an unreasonable risk of injury to health under the conditions of use. On October 31, 2023, EPA issued a proposed rule (88 FR 74712) (FRL–8317–01–OCSPP) under TSCA section 6(a) to regulate TCE so that it no longer presents unreasonable risk (hereinafter "2023 TCE proposed rule"). The Agency received public comment on the proposed rule, and with this action, EPA is finalizing the 2023 TCE proposed rule with modifications so that TCE no longer presents an unreasonable risk. The conditions of use that contribute to the unreasonable risk from TCE are described in Unit III.B.1. of the 2023 TCE proposed rule.

EPA emphasizes that while some of the adverse effects from TCE exposure are experienced following acute single exposures, other risks are incurred following long-term repeated exposures. Risks of non-cancer effects, specifically fetal cardiac defects and autoimmunity, are the most sensitive adverse effects following exposure. In addition, risks of other significant adverse outcomes associated with TCE exposure include: non-cancer effects (liver toxicity, kidney toxicity, neurotoxicity, immunosuppression, reproductive toxicity, and developmental toxicity), as well as cancer (liver, kidney, and non-Hodgkin's lymphoma). This final rule will eliminate the unreasonable risk to human health from TCE, as identified in the 2020 Risk Evaluation for TCE (Ref. 1) and the 2023 Revised Unreasonable Risk Determination for TCE (Ref. 2).

While EPA's rule will result in a ban of TCE, the timeframes for the phase-outs differ across conditions of use and are described in fuller detail in Unit IV.B. One phase-out is for uses that may impact the Agency's efforts to address climate-damaging HFCs (and the associated adverse impacts on human health and the environment) under the American Innovation and Manufacturing Act of 2020 (AIM Act) (42 U.S.C. 7675). EPA is implementing a longer phase-out in tandem with strict workplace controls for the manufacturing (including import) and processing of TCE as an intermediate in the generation of HFC–134a, one of the regulated substances subject to a phasedown under the AIM Act. More information on HFC–134a is in Unit V.A.1. of the 2023 TCE proposed rule.

Additionally, the Agency recognizes that alternatives to TCE may not be readily available for some important conditions of use. As an example, EPA is finalizing a longer phase-out timeframe for industrial and commercial use of TCE as a solvent for closed-loop batch vapor degreasing for rayon fabric scouring for end use in rocket booster nozzle production by Federal agencies and their contractors. Currently, substitutes and alternative processes do not meet the technical specifications required to clean the rayon fabric in order to safely produce rockets. Similarly, EPA is finalizing a longer phase-out for the industrial and commercial use of TCE in laboratory use for asphalt testing and recovery, based on information provided by state departments of transportation and regulated entities regarding the timeframes needed for revising state certifications that currently include this use of TCE for, among other activities, enabling the recycling of asphalt.

Additionally, EPA recognizes that some conditions of use may be important for national security applications or for other critical needs. For these reasons, this final rule includes a 15-year exemption under TSCA section 6(g) for industrial and commercial use of TCE as a processing aid for battery separator manufacturing in the production of lead-acid battery separators, as well as for the manufacturing, processing, and distribution in commerce of TCE for this use. EPA recognizes that battery separators are essential components of batteries that power vehicles and systems in the U.S. supply chain for multiple critical infrastructure sectors within the national economy. Further, there are a number of critical uses required for DoD vessels. EPA is finalizing a 10-year exemption under TSCA section 6(g) for DoD vessel requirements for potting, bonding and sealing compounds, and bonding and cleaning requirements for naval combat systems, radars, sensors, equipment, and fabrication and prototyping processes. Additionally, EPA is finalizing a 50-year exemption under TSCA section 6(g) for the industrial and commercial use of TCE for critical laboratory activities; for example, laboratory activities associated with ongoing environmental cleanup projects that fall under the Superfund program or other similar EPA authorities, in which it is necessary to use TCE as a laboratory chemical for the analysis of contaminated soil, air, and water samples.

EPA proposed and is finalizing a requirement to comply with a WCPP, which includes monitoring, adherence to industrial hygiene best practices, and requirements to meet an interim ECEL as a condition for most of the conditions of use for which a phase-out or time-limited exemption was provided. For the remaining conditions of use for which a phase-out or time-limited exemption was provided, EPA is requiring prescriptive worker controls. For many of the conditions of use for which EPA is finalizing longer phase-outs or time-limited exemptions under the WCPP, data were submitted to support many commenters' position that a higher interim ECEL than the limit proposed is necessary for successful implementation of worker protections before those conditions of use are prohibited. These comments were submitted to inform the risk evaluation, Small Business Advocacy Review (SBAR) Panel process, the comment period following publication of the 2023 TCE proposed rule, or during stakeholder outreach, and are available in the corresponding public dockets (EPA–HQ–OPPT–2020–0642; EPA–HQ–OPPT–2019–0500; EPA–HQ–OPPT–2016–0737, respectively).

E. What are the estimated incremental impacts of this action?

EPA has prepared an Economic Analysis of the potential incremental impacts associated with this rulemaking that can be found in the rulemaking

docket (Ref. 3). As described in more detail in the Economic Analysis (Ref. 3), EPA was unable to quantify all incremental costs of this rule. The quantifiable cost of the rule is estimated to be $64.1 million annualized over 20 years at a 2% discount rate, $71.3 million annualized at 3%, and $102.4 million annualized at a 7% discount rate. These costs take into consideration costs of compliance with implementation of an interim WCPP for certain conditions of use, based on an interim ECEL of 0.2 ppm (1.07 mg/m^3) for inhalation exposures as an 8-hour time-weighted average (TWA), costs for transitioning to alternatives, where possible, and reformulation costs of numerous products. Estimated costs for the interim WCPP include costs for monitoring and applicable personal protective equipment (PPE). There are a number of notable unquantified costs. These are described in this Unit and more fully in section 7.12 of the Economic Analysis.

Alternative products with similar cost and efficacy are available for most of the products that are formulated with TCE. However, for some applications, there may be additional unquantified costs associated with the alternatives including costs to develop alternatives where they are not currently available. For instance, in some cases, some effort might be required by firms using TCE products to identify suitable alternatives, test them for their desired applications, learn how to use them safely and effectively, and implement new processes for using the alternative products. There may also be some safety-critical applications, such as energized electrical equipment cleaners and adhesives and sealants specifically for aerospace applications, where alternatives would need to undergo extensive safety reviews and testing before they could replace the TCE products. The information to estimate how often these costs might be incurred or what the specific costs would be per-user or per-firm when they are incurred is not available. Therefore, EPA is unable to consider these costs quantitatively.

There also may be some unquantified costs associated with the implementation of a WCPP. EPA used available air monitoring data as well as modelled data to estimate a distribution of exposure concentrations, but since these data were not collected in the same way monitoring data under a WCPP would be collected, these estimated distributions are uncertain and therefore, the costs of compliance with the WCPP are uncertain. The WCPP costs also assume that when the exposure levels exceed the interim ECEL, compliance is achieved by implementing a respirator PPE program. However, and consistent with the hierarchy of controls, the final rule requires implementation of feasible engineering and administrative controls before using PPE to reduce exposure to or below the interim ECEL. These costs would be specific to individual firms, and EPA does not have sufficient information to estimate these costs.

The costs of alternative identification, testing, and potential process changes could not be estimated for battery separator manufacturers, synthetic paper processors, and fluoroelastomer producers. It is expected that these facilities would need to adopt process and/or physical plant changes in order to comply with the rule. EPA does not have sufficient information to estimate the costs of the prohibition to these sectors.

EPA expects the processing of TCE as an intermediate for the manufacture of HFC–134a to decline over time, in light of the AIM Act requirements (Ref. 4). At some point, the domestic manufacture of HFC–134a may be discontinued. While the timing for this discontinuation is uncertain, it is unclear whether this rule will hasten the closure of plants that use TCE to produce HFC–134a. There could be some unknown cost impacts associated with hastening the closure of these two plants.

EPA is finalizing a 10-year phase-out for the industrial and commercial use of TCE as a solvent for closed-loop batch vapor degreasing for rayon fabric scouring for end use in rocket booster nozzle production by Federal agencies and their contractors, conditioned on Federal agencies performing within 5 years a final pre-launch test of rocket booster nozzles that have been produced without using TCE. EPA does not have information to estimate the cost of such a test. The prohibition of TCE used in vapor degreasing for narrow tubing for aerospace and medical devices is expected to require testing and certification of alternative solvents and/or processes to meet strict safety and performance requirements. These costs will be specific to a facility's design, selected alternative, and end use of the product. EPA does not have information to estimate the costs associated with meeting these safety and performance requirements.

The disposal of TCE from cleanup projects to industrial pre-treatment, industrial treatment, or publicly owned treatment works is prohibited after the TSCA section 6(g) exemption ends, 50 years after the rule is finalized. If cleanup is not finished by the end of this time period and the TSCA section 6(g) exemption has not been extended, cleanup sites will need to identify and implement alternative disposal or treatment methods and will likely also need to renegotiate Resource Conservation and Recovery Act (RCRA) permits or Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) agreements to include those changes. These approaches could be more costly to implement and/or increase the duration of cleanups allowing any potential environmental or human health impacts to continue for a longer period of time. The information to estimate how often these costs might be incurred or what the specific costs would be per site when they are incurred is not available.

During the timeframe of the exemptions, this rule requires owners and operators of cleanup sites with TCE exposures to potentially exposed persons (*e.g.*, workers or others in the workplace, such as persons directly handling the chemical or in the area where the chemical is being used) as well as publicly owned treatment works (POTWs) receiving TCE wastes from cleanup sites, battery separator manufacturers, and specialty polymeric microporous sheet material manufacturers to comply with the Occupational Safety and Health Administration's (OSHA's) Hazardous Waste Operations and Emergency Response (HAZWOPER) requirements modified to incorporate the interim ECEL (for cleanup sites) and WCPP requirements modified to include a water screening method (for POTWs). EPA does not have sufficient information to estimate the number of sites and workers that may need to meet the requirements to protect potentially exposed persons and could not estimate the costs for those protections. In addition, the economic analysis does not estimate costs regarding disposal of TCE or TCE-containing products after the effective date prohibiting the industrial and commercial use and disposal of TCE to industrial pre-treatment, industrial treatment, or publicly owned treatment works. The final rule includes a staggered compliance timeline throughout the supply chain to allow for much of the TCE to be used before disposal is necessary. However, some unused product may need to be disposed of as hazardous waste. Since there is no reliable way of estimating the volume of this waste, the additional disposal costs are not quantified in this economic

analysis. Finally, EPA could not estimate any potential business closures or off-shoring of businesses that might result from the rule. Vapor degreasing is one use of TCE where switching to a suitable alternative may be challenging and where closing or off-shoring may be a compliance strategy. EPA estimates that 366 facilities still use TCE in vapor degreasers, a majority of which are small businesses. There is no standard generally accepted approach for estimating the cost impacts of a firm closure. Despite information EPA has sought from stakeholders and commenters, including through a SBAR Panel, it is not clear whether or how many firms might choose closure as a compliance strategy, nor what the costs might be.

Following the mandate of TSCA to address unreasonable risk to health as well as in alignment with the goals of President Biden's Cancer Moonshot, the rule will protect people from cancer and other significant adverse health effects of TCE by prohibiting the manufacture (including import), processing, and distribution in commerce of TCE for all uses while allowing for a longer reasonable transition period or time-limited exemptions for certain uses (Ref. 5). The actions in this final rule are expected to achieve health benefits for the American public, some of which can be monetized and others that, while tangible and significant, cannot be monetized due to data and methodology limitations. The monetized benefits of this rule are approximately $22.9 million to $ 23.2 million annualized over 20 years at a 2% discount rate, $18.2 million to $18.3 million annualized over 20 years at 3%, and $8.7 million to $ 8.9 million annualized over 20 years at a 7% discount rate. These monetized benefits only include potential reductions in risk of liver, kidney, and non-Hodgkin's lymphoma cancers associated with reducing chronic TCE exposure.

There are a number of non-cancer endpoints associated with exposure to TCE, including liver toxicity, kidney toxicity, reproductive effects, neurotoxicity, immunotoxicity effects and fetal cardiac defects (Ref. 1). There is human evidence for hepatitis accompanying immune-related generalized skin diseases, jaundice, hepatomegaly, hepatosplenomegaly, and liver failure in TCE-exposed workers and changes in the proximal tubules of the kidney following exposure to TCE, and occupational studies have shown increased levels of kidney damage (proximal tubules) and end-stage renal disease in TCE-exposed workers. Evidence exists to associate TCE with reproductive effects. Most human studies support an association between TCE exposure and alterations in sperm density and quality, as well as changes in sexual drive or function and serum endocrine levels. Fewer epidemiological studies exist linking decreased incidence of fecundability (time-to pregnancy) and menstrual cycle disturbances in women with TCE exposures. Human studies have consistently reported vestibular system related symptoms such as headaches, dizziness, and nausea following TCE exposure. Several newer epidemiological studies have found an association between TCE exposure and neurodegenerative disorders such as amyotrophic lateral sclerosis and Parkinson's disease (Ref. 1). EPA does not have sufficient information to estimate the monetized benefits of the rule with respect to these noncancer effects, and therefore monetized benefits are likely underestimated.

EPA does estimate that there 67,869 workers and occupational non-users (ONUs, or people who do not directly handle the chemical, but are in close proximity) exposed to TCE and of those, approximately 1,162 pregnant workers and ONUs annually that may potentially benefit from a reduced risk of fetal cardiac defects resulting from reduced TCE exposure. Although EPA has not developed a complete estimate of the monetized benefits associated with avoiding fetal cardiac defects, as described in the Economic Analysis (Ref. 3), Arth, Tinker et al. (Ref. 6) estimated a mean annual cost of $41,166 (2013$) (median $14,552) for each fetal cardiac defects-associated hospitalization. For critical fetal cardiac defects, mean and median costs were estimated at $79,011 and $29,886 (2013$), respectively, for each incidence. In addition to hospitalization costs, individuals with fetal cardiac defects will likely incur healthcare costs associated with physician visits and outpatient care. They are also more likely to require specialized healthcare such as medications, physical or speech therapy, or treatment for developmental or behavioral problems (Ref. 7). Additional social costs may include caregiver burden and mental health services (Ref. 8), as well as non-market costs such as pain and suffering and fetal cardiac defect-related mortality. Because these costs are not accounted for, monetized benefits are likely underestimated. The severity of specific types of fetal cardiac defects and associated costs will vary depending on the type of heart defect.

Additionally, to the extent that the rule reduces the amount of TCE in drinking water systems and thereby exposures to populations using those drinking water sources, there could be potential health-related benefits related to improved drinking water quality that EPA was unable to quantify.

II. Background

A. Overview of TCE

As described in more detail in the 2023 TCE proposed rule, TCE is an immunotoxicant and developmental toxicant and is carcinogenic to humans by all routes of exposure. This final rule is specifically intended to address the unreasonable risk of injury to health that EPA has identified in the 2020 Risk Evaluation for TCE (Ref. 1) and 2023 Revised Unreasonable Risk Determination (Ref. 2), as described in Unit II.D. of the 2023 TCE proposed rule. TCE is a volatile organic compound (VOC) used in industry as well as in commercial and consumer products. The total aggregate annual production volume ranged from 100 to 250 million pounds between 2016 and 2019 according to the most recent (2020) Chemical Data Reporting (CDR) data (Ref. 9). The majority of TCE is processed as an intermediate during the manufacture of refrigerants, specifically HFC–134a, which accounts for about 83.6% of TCE's annual production volume (Ref. 1). TCE is also used as a solvent, frequently in cleaning and degreasing (including spot cleaning, vapor degreasing, cold cleaning, and aerosol degreasing), which accounts for another 14.7% of TCE production volume. Other uses account for approximately 1.7% of TCE production volume. TCE is used as a solvent in a variety of commercial and consumer applications including in lubricants, adhesives and sealants, paints and coatings, and other miscellaneous products.

B. Regulatory Actions Pertaining to TCE

Because of its significant adverse health effects, TCE is subject to numerous State, Federal, and international regulations restricting and regulating its use. A summary of EPA regulations pertaining to TCE, as well as other Federal, State, and international regulations, is in the docket (Ref. 10).

As described in more detail in the 2023 TCE proposed rule and in the Response to Public Comments document (Ref. 11), EPA considered the adequacy of the current regulation of TCE by OSHA for protection of workers. EPA notes that the standards for chemical hazards that OSHA promulgates under the Occupational Safety and Health (OSH) Act share a

broadly similar purpose with the worker protection-related standards that EPA promulgates under TSCA section 6(a). The control measures OSHA and EPA require to satisfy the objectives of their respective statutes may also, in many circumstances, overlap or coincide. However, there are important differences between EPA's and OSHA's regulatory approaches and jurisdiction, and EPA considers these differences when deciding whether and how to account for OSHA requirements when evaluating and addressing potential unreasonable risk to workers so that compliance requirements are clearly explained to the regulated community. TSCA risk evaluations are subject to statutory science standards, an explicit requirement to consider risks to potentially exposed or susceptible subpopulations, and a prohibition on considering costs and other non-risk factors when determining whether a chemical presents an unreasonable risk that warrants regulatory actions—all requirements that do not apply to development of OSHA regulations. As such, EPA may find unreasonable risk for purposes of TSCA notwithstanding OSHA requirements. In addition, health standards issued under section 6(b)(5) of the OSH Act must reduce significant risk only to the extent that it is technologically and economically feasible. OSHA's legal requirement to demonstrate that its section 6(b)(5) standards are technologically and economically feasible at the time they are promulgated often precludes OSHA from imposing exposure control requirements sufficient to ensure that the chemical substance no longer presents a significant risk to workers. While it is possible in some cases that the OSHA standards for some chemicals reviewed under TSCA will eliminate unreasonable risk, based on EPA's experience thus far in conducting occupational risk assessments under TSCA, EPA believes that OSHA chemical standards would in general be unlikely to address unreasonable risk to workers within the meaning of TSCA, since TSCA section 6(b) unreasonable risk determinations may account for unreasonable risk to more sensitive endpoints and working populations than OSHA's risk evaluations typically contemplate and EPA is obligated to apply TSCA section 6(a) risk management requirements to the extent necessary so that the unreasonable risk is no longer presented. Because the requirements and application of TSCA and OSHA regulatory analyses differ, it is necessary for EPA to conduct risk evaluations and, where it finds unreasonable risk to workers, develop risk management requirements for chemical substances that OSHA also regulates, and it is expected that EPA's findings and requirements may sometimes diverge from OSHA's. Additional considerations of OSHA standards in the revised unreasonable risk determination are discussed further in the 2023 Revised Unreasonable Risk Determination for TCE (88 FR 1222, January 9, 2023 (FRL–9945–02–OCSPP)).

C. Summary of EPA's Risk Evaluation Activities on TCE

In July 2017, EPA published the scope of the TCE risk evaluation (82 FR 31592, July 7, 2017 (FRL–9963–57)), and, after receiving public comments, published the problem formulation in June 2018 (83 FR 26998, June 11, 2018 (FRL–9978–40)). In February 2020, EPA published a draft risk evaluation (85 FR 11079, February 26, 2020 (FRL–10005–52)), and, after public comment and peer review by the Science Advisory Committee on Chemicals (SACC), EPA issued the 2020 Risk Evaluation for TCE in November 2020 in accordance with TSCA section 6(b) (85 FR 75010, November 24, 2020 (FRL–10016–91)). EPA subsequently issued a draft revised TSCA risk determination for TCE (87 FR 40520, July 7, 2022 (FRL–9945–01–OCSPP)), and, after public notice and comment, published a Revised Risk Determination for TCE in January 2023 (88 FR 1222, January 9, 2023 (FRL–9945–02–OCSPP)). The 2020 Risk Evaluation for TCE and supplemental materials are in Docket ID No. EPA–HQ–OPPT–2019–0500, and the January 2023 Revised Unreasonable Risk Determination for TCE and additional materials supporting the risk evaluation process are in Docket ID No. EPA–HQ–OPPT–2016–0737. Both dockets can be accessed online through *https://www.regulations.gov*.

1. 2020 Risk Evaluation for TCE

In the 2020 Risk Evaluation for TCE, EPA evaluated risks associated with 54 conditions of use within the following categories: manufacture (including import), processing, distribution in commerce, industrial and commercial use, consumer use, and disposal (Ref. 1). Descriptions of these conditions of use are in Unit III.B.1. of the 2023 TCE proposed rule. The 2020 Risk Evaluation for TCE identified significant adverse health effects associated with short- and long-term exposure to TCE. A further discussion of the hazards of TCE is presented in Unit III.B.2. of the 2023 TCE proposed rule.

2. 2023 Revised Unreasonable Risk Determination for TCE

As described in more detail in EPA's 2023 TCE proposed rule, EPA revised the original unreasonable risk determination based on the 2020 Risk Evaluation for TCE and issued a final revised unreasonable risk determination in January 2023 (Ref. 2). EPA revised the risk determination for the 2020 Risk Evaluation for TCE pursuant to TSCA section 6(b) and consistent with Executive Order 13990 ("Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis") and other Administration priorities. The revisions consisted of making the risk determination based on the whole chemical substance instead of making risk determinations for each individual condition of use, which resulted in the revised risk determination superseding the prior "no unreasonable risk" determinations for specific conditions of use (Ref. 2), the withdrawal of the associated TSCA section 6(i)(1) "no unreasonable risk" order, and clarification that the risk determination does not reflect an assumption that all workers are always provided and appropriately wear PPE (Ref. 2).

EPA determined that TCE presents an unreasonable risk of injury to health and did not identify risks of injury to the environment that contribute to the unreasonable risk determination for TCE. The TCE conditions of use that contribute to EPA's determination that the chemical substance poses unreasonable risk to health are listed in the unreasonable risk determination (Ref. 2) and the 2023 TCE proposed rule, with descriptions to aid chemical manufacturers, processors, and users in determining how their particular use or activity would be addressed under the final regulatory action.

3. Description of Unreasonable Risk

EPA has determined that TCE presents an unreasonable risk of injury to human health under the conditions of use based on acute and chronic non-cancer risks and cancer risks (Ref. 2). As described in the TSCA section 6(b) 2020 Risk Evaluation for TCE, EPA identified non-cancer adverse effects from acute and chronic inhalation and dermal exposures to TCE, and for cancer from chronic inhalation and dermal exposures to TCE (Ref. 1). In the TCE risk characterization, the endpoints identified by EPA as the basis for the unreasonable risk determination in the Risk Conclusions were immunosuppression effects for acute inhalation and dermal exposures, and

autoimmunity effects for chronic inhalation and dermal exposures (Ref. 1). Additional risks associated with other non-cancer adverse effects (*e.g.*, developmental toxicity, immunosuppression, liver toxicity, kidney toxicity, neurotoxicity, autoimmunity, and reproductive toxicity) were identified for acute and chronic inhalation and dermal exposures. EPA also concluded, based on EPA's Guidelines for Carcinogen Risk Assessment (Ref. 12), that TCE is carcinogenic by all routes of exposure, and identified cancer risk (liver, kidney, and non-Hodgkin lymphoma) from chronic inhalation and dermal exposures (Ref. 2). Unit VII. of the 2023 TCE proposed rule summarizes the health effects and the magnitude of the exposures.

To make the unreasonable risk determination for TCE, EPA evaluated exposures to PESS including workers, ONUs, consumer users, and bystanders to consumer use by using reasonably available monitoring and modeling data for inhalation and dermal exposures (Ref. 1). EPA conducted a screening-level analysis to assess potential risks from the air and water pathways to fenceline communities. A discussion of EPA's analysis and the expected effects of this rulemaking on fenceline communities is in Unit VII.A. of the 2023 TCE proposed rule.

For the 2020 Risk Evaluation for TCE, and as discussed in Unit II.D.1. and Unit III.A.3. of the 2023 TCE proposed rule, EPA considered PESS. EPA identified the following groups as PESS: workers and ONUs, including men and women of reproductive age, adolescents, and biologically susceptible subpopulations; and consumer users and bystanders (of any age group, including infants, toddlers, children, and elderly), including biologically susceptible subpopulations. Additionally, older pregnant women are identified as especially susceptible to cardiac defects in their developing fetus based on epidemiological data (Ref. 1). All PESS are included in the quantitative and qualitative analyses described in the 2020 Risk Evaluation for TCE and were considered in the determination of unreasonable risk for TCE (Refs. 1, 2).

4. Conditions of Use Subject to This Regulatory Action

As noted in Unit I.C. of this final rule, the term "conditions of use" is defined in TSCA section 3(4). Condition of use descriptions are provided in Unit III.B.1. of the 2023 TCE proposed rule and were obtained from EPA sources such as CDR use codes, the 2020 Risk Evaluation for TCE and related documents, as well as the Organisation for Economic Co-operation and Development harmonized use codes, and stakeholder engagements. EPA did not receive public comments identifying inaccuracies or necessitating changes to those descriptions; however, EPA received some comments requesting clarification for particular uses, which can be found in the Response to Comments document (Ref. 11). Additionally, to assist with implementation and compliance with the final rule, in Units IV.C.1., IV.D.1., and IV.E.1. of this final rule, EPA has provided a description of the conditions of use that are subject to the WCPP or other workplace controls during phaseout or time-limited exemption before prohibition.

For the purposes of this final rule, "occupational conditions of use" refers to the TSCA conditions of use other than consumer use as described in Units III.B.1.a., b., c., and e. of the 2023 TCE proposed rule. Although EPA identified both industrial and commercial uses in the 2020 Risk Evaluation for TCE (Ref. 1) for purposes of distinguishing scenarios, the Agency clarified then and clarifies now that EPA interprets the authority Congress gave to the Agency to "regulat[e] any manner or method of commercial use" under TSCA section 6(a)(5) to reach both industrial and commercial uses.

Additionally, as described in the 2023 TCE proposed rule and in the 2020 Risk Evaluation for TCE (Ref. 1), EPA identified and assessed all known, intended, and reasonably foreseen industrial, commercial, and consumer uses of TCE. EPA determined that all industrial, commercial, and consumer uses of TCE evaluated in the 2020 Risk Evaluation for TCE contribute to the unreasonable risk of injury to health. As such, for purposes of this risk management rule, "consumer use" refers to all known, intended, or reasonably foreseen TCE consumer uses. Likewise, for the purpose of this risk management rule, "industrial and commercial use" refers to all known, intended, or reasonably foreseen TCE industrial and commercial uses.

EPA further notes that this rule does not apply to any substance excluded from the definition of "chemical substance" under TSCA section 3(2)(B)(i) through (vi). Those exclusions include, but are not limited to, any pesticide (as defined by the Federal Insecticide, Fungicide, and Rodenticide Act) when manufactured, processed, or distributed in commerce for use as a pesticide; and any food, food additive, drug, cosmetic, or device, as defined in section 201 of the Federal Food, Drug, and Cosmetic Act, when manufactured, processed, or distributed in commerce for use as a food, food additive, drug, cosmetic or device.

D. EPA's 2023 Proposed Rule for TCE

1. Description of TSCA Section 6(a) Requirements

Under TSCA section 6(a), if the Administrator determines through a TSCA section 6(b) risk evaluation that a chemical substance presents an unreasonable risk of injury to health or the environment, without consideration of costs or other non-risk factors, including an unreasonable risk to a PESS identified as relevant to the Agency's risk evaluation, under the conditions of use, EPA must by rule apply one or more of the section 6(a) requirements to the extent necessary so that the chemical substance no longer presents such risk.

The TSCA section 6(a) requirements can include one or more of the following actions alone or in combination:

- Prohibit or otherwise restrict the manufacturing (including import), processing, or distribution in commerce of the substance or mixture, or limit the amount of such substance or mixture which may be manufactured, processed, or distributed in commerce (section 6(a)(1)).
- Prohibit or otherwise restrict the manufacturing, processing, or distribution in commerce of the substance or mixture for a particular use or above a specific concentration for a particular use (section 6(a)(2)).
- Limit the amount of the substance or mixture which may be manufactured, processed, or distributed in commerce for a particular use or above a specific concentration for a particular use specified (section 6(a)(2)).
- Require clear and adequate minimum warning and instructions with respect to the substance or mixture's use, distribution in commerce, or disposal, or any combination of those activities, to be marked on or accompanying the substance or mixture (section 6(a)(3)).
- Require manufacturers and processors of the substance or mixture to make and retain certain records or conduct certain monitoring or testing (section 6(a)(4)).
- Prohibit or otherwise regulate any manner or method of commercial use of the substance or mixture (section 6(a)(5)).
- Prohibit or otherwise regulate any manner or method of disposal of the substance or mixture, or any article containing such substance or mixture,

by its manufacturer or processor or by any person who uses or disposes of it for commercial purposes (section 6(a)(6)).

- Direct manufacturers or processors of the substance or mixture to give notice of the unreasonable risk determination to distributors, certain other persons, and the public, and to replace or repurchase the substance or mixture (section 6(a)(7)).

In the 2023 TCE proposed rule, EPA analyzed how the TSCA section 6(a) requirements could be applied to address the unreasonable risk from TCE so that it no longer presents such risk. This unit summarizes the TSCA section 6 considerations for issuing regulations under TSCA section 6(a), and Unit IV. outlines how EPA applied these considerations while managing the unreasonable risk from TCE.

As required, EPA developed a proposed regulatory action and one primary alternative regulatory action, which are described in Units V.A. and V.B. of the 2023 TCE the proposed rule, respectively. To identify and select a regulatory action, EPA considered the two routes of exposure driving the unreasonable risk, inhalation and dermal, and the exposed populations. For occupational conditions of use, EPA considered how it could directly regulate manufacturing (including import), processing, distribution in commerce, industrial and commercial use, or disposal to address the unreasonable risk. EPA also considered how it could exercise its authority under TSCA to regulate the manufacturing (including import), processing, and/or distribution in commerce of TCE at different levels in the supply chain to eliminate exposures or restrict the availability of TCE and TCE-containing products for consumer use in order to address the unreasonable risk.

As required by TSCA section 6(c)(2), EPA considered several factors, in addition to identified unreasonable risk, when selecting among possible TSCA section 6(a) regulatory requirements for the proposed rule. EPA's considerations regarding TSCA section 6(c)(2) for TCE are discussed in full in Unit VII. of the 2023 TCE proposed rule, including the statement of effects with respect to the section 6(c)(2)(A) considerations.

As described in more detail in the 2023 TCE proposed rule, EPA also considered regulatory authorities under statutes administered by other agencies such as the Occupational Safety and Health (OSH) Act, the Consumer Product Safety Act (CPSA), and the Federal Hazardous Substances Act (FHSA), as well as other EPA-administered statutes, to examine (1) Whether there are opportunities to address unreasonable risk under other statutes, such that a referral may be warranted under TSCA section 9(a) or 9(b); or (2) Whether TSCA section 6(a) regulation could include alignment of requirements and definitions in and under existing statutes and regulations to minimize confusion to the regulated entities and the general public.

Additionally, as described in more detail in EPA's 2023 TCE proposed rule in Unit VI.B, EPA considered the availability of alternatives when finalizing a prohibition or a substantial restriction (TSCA section 6(c)(2)(C)), and in setting final compliance dates in accordance with the requirements in TSCA section 6(d)(1).

To the extent information was reasonably available, EPA considered pollution prevention strategies and the hierarchy of controls adopted by OSHA and the National Institute for Occupational Safety and Health (NIOSH) when developing its proposed rule, with the goal of identifying risk management control methods that would be permanent, feasible, and effective. EPA also considered how to address the unreasonable risk while providing flexibility to the regulated community where appropriate and took into account the information presented in the 2020 Risk Evaluation for TCE (Ref. 1), input from stakeholders, insight received during consultations, and anticipated compliance strategies from regulated entities.

Taken together, these considerations led EPA to the proposed regulatory action and primary alternative action described in this Unit. Additional details related to how the requirements in this Unit were incorporated into development of the proposed rule and primary alternative action are in Unit VI. of the 2023 TCE proposed rule.

2. Consultations and Other Engagement

a. Consultations

EPA conducted consultations and outreach as part of development of the 2023 TCE proposed rule. The Agency held a federalism consultation from July 22, 2021, until October 22, 2021, as part of the rulemaking process and pursuant to Executive Order 13132 (Ref. 13).

EPA also consulted with tribal officials during the development of the 2023 TCE proposed rule. The Agency held a tribal consultation from May 17, 2021, to August 20, 2021, with meetings on June 15 and July 8, 2021 (Ref. 14). EPA received no written comments as part of this consultation.

EPA's environmental justice (EJ) consultation occurred from June 3, 2021, through August 20, 2021. On June 16 and July 6, 2021, EPA held public meetings as part of this consultation. These meetings were held pursuant to Executive Orders 12898 and 14008. EPA received three written comments following the EJ meetings, in addition to oral comments provided during the consultations (Refs. 15, 16, 17, 18). A brief summary of the comments is in Unit III.A.1 of the 2023 TCE proposed rule.

As required by section 609(b) of the Regulatory Flexibility Act (RFA), EPA convened a SBAR Panel to obtain advice and recommendations from Small Entity Representatives (SERs) that potentially would be subject to the rule's requirements. EPA met with SERs before and during Panel proceedings, on October 28, 2022, and January 31, 2023. Panel recommendations were presented in the SBAR Panel report (Ref. 19) and were addressed in Unit XI.C. of the 2023 TCE proposed rule and in the Initial Regulatory Flexibility Analysis (IRFA) (Ref. 20). EPA has also prepared a Final Regulatory Flexibility Analysis (FRFA) (Ref. 21).

More information about these consultations is presented in Units III.A.1., XI.C., XI.E., XI.F., and XI.J. of the 2023 TCE proposed rule.

b. Other Stakeholder Consultations

For development of the proposed rule, in addition to the formal consultations described in Unit XI. of the 2023 TCE proposed rule, EPA provided an overview of the TSCA risk management process and the risk evaluation findings for TCE on December 15, 2020 (Ref. 22). EPA also presented on the TSCA risk management process and the findings in the 2020 Risk Evaluation for TCE at a Small Business Administration (SBA) Office of Advocacy Environmental Roundtable on December 18, 2020 (Ref. 19). Attendees of these meetings were given an opportunity to voice their concerns regarding the risk evaluation and risk management.

Furthermore, during development of the proposed rule, EPA engaged in discussions with representatives from different industries, non-governmental organizations, technical experts, organized labor, and users of TCE. A list of external meetings held during the development of the 2023 TCE proposed rule is in the docket (Ref. 23); meeting materials and summaries are also in the docket. See Unit III.A.2. of the 2023 TCE proposed rule for a summary of the topics discussed during the meetings.

c. Children's Environmental Health

The Agency's 2021 Policy on Children's Health (Ref. 24) requires EPA

to protect children from environmental exposures by consistently and explicitly considering early life exposures (from conception, infancy, and early childhood and through adolescence until 21 years of age) and lifelong health in all human health decisions through identifying and integrating children's health data and information when conducting risk assessments. TSCA section 6(b)(4)(A) also requires EPA to conduct risk evaluations "to determine whether a chemical substance presents an unreasonable risk of injury to health or the environment . . . including an unreasonable risk to a PESS identified as relevant to the risk evaluation by the Administrator, under the conditions of use." In addition, TSCA section 6(a) requires EPA to apply one or more risk management requirements so that TCE no longer presents an unreasonable risk (which includes unreasonable risk to any relevant PESS). Information about the health and risk assessments supporting this action and how the Policy was applied is presented in Unit II.C., II.D., and IV.A. of the 2023 TCE proposed rule, as well as in the 2020 Risk Evaluation for TCE, and the Economic Analysis for this rule (Refs. 25, 1, 3).

3. Proposed Regulatory Action

EPA's 2023 TCE proposed rule under TSCA section 6(a) to address the unreasonable risk presented by TCE under its conditions of use included the following:

(i) Prohibition of the manufacture (including import), processing, and distribution in commerce of TCE for all uses (including all consumer uses), with longer compliance timeframes for manufacture and processing related to certain uses;

(ii) Prohibition of the industrial and commercial use of TCE, with longer compliance timeframes for certain uses;

(iii) Prohibition of the manufacture (including import) and processing of TCE as an intermediate for the manufacturing of HFC–134a, following an 8.5-year phase-out;

(iv) Prohibition of the industrial and commercial use of TCE as a solvent for closed-loop batch vapor degreasing for rayon fabric scouring for end use in rocket booster nozzle production by Federal agencies and their contractors, following a 10-year phase-out;

(v) For vessels of the Armed Forces and their systems, and in the maintenance, fabrication, and sustainment for and of such vessels and systems, prohibition of the industrial and commercial use of TCE as: potting compounds for naval electronic systems and equipment; sealing compounds for high and ultra-high vacuum systems; bonding compounds for materials testing and maintenance of underwater systems and bonding of nonmetallic materials; and cleaning agents to satisfy cleaning requirements (which includes degreasing using wipes, sprays, solvents and vapor degreasing) for: materials and components required for military ordinance testing; temporary rosin repairs in vessel spaces where welding is not authorized; ensuring polyurethane adhesion for electronic systems and equipment repair and installation of elastomeric materials; various naval combat systems, radars, sensors, equipment; fabrication and prototyping processes to remove coolant and other residue from machine parts; machined part fabrications for naval systems; installation of topside rubber tile material aboard vessels; and vapor degreasing required for substrate surface preparation prior to electroplating processes, following a 10-year TSCA section 6(g) exemption;

(vi) Prohibition of the manufacture (including import), processing, distribution in commerce, and use of TCE as a processing aid for battery separator manufacturing, following a 10-year TSCA section 6(g) exemption;

(vii) Prohibition of the manufacture (including import), processing, distribution in commerce, and use of TCE as a laboratory chemical for essential laboratory activities and some research and development activities, following a 50-year TSCA section 6(g) exemption;

(viii) Prohibition of the manufacture (including import), processing, distribution in commerce, and industrial and commercial use of TCE as a solvent in closed loop vapor degreasing necessary for human-rated rocket engine cleaning by NASA and its contractors, following a 7-year TSCA section 6(g) exemption;

(ix) Prohibition of the emergency industrial and commercial use of TCE in furtherance of the NASA mission for specific conditions which are critical or essential and for which no technically and economically feasible safer alternative is available, following a 10-year TSCA section 6(g) exemption;

(x) Requirements for strict workplace controls, including compliance with a TCE WCPP, which would include requirements for an inhalation exposure limit and dermal protection to limit exposure to TCE, for conditions of use with long term phase-outs or time-limited exemptions under TSCA section 6(g);

(xi) Prohibition of, due to worker risks, the disposal of TCE to industrial pre-treatment, industrial treatment, or publicly owned treatment works, with a 50-year TSCA section 6(g) exemption for cleanup projects; and

(xii) Requirements for recordkeeping and downstream notification.

EPA notes that all TSCA conditions of use of TCE were subject to the 2023 TCE proposed rule and are subject to this final rule.

The proposed rule included timeframes for implementation. The prohibitions EPA proposed would take effect in phases, beginning at the top of the supply chain, and coming into full effect, for most conditions of use, after 90 days for manufacturers, in 180 days for processors, and in 270 days for most industrial and commercial users, with different timeframes related to specific conditions of use. Specifically, for processing TCE as a reactant/intermediate, EPA proposed that the compliance dates for the proposed prohibitions would come into effect in 1.5 years for manufacturers and 2 years for processors EPA proposed additional exceptions from the prohibition for the manufacturing and processing associated with certain processing and industrial and commercial uses, including phase-outs (see Units V.A.1.b., d., and e., of the 2023 TCE proposed rule or time-limited exemptions under TSCA section 6(g) (see Unit V.A.3.b. of the 2023 TCE proposed rule). Likewise, for the WCPP that would be required for several conditions of use before prohibitions went into effect, EPA proposed timeframes for phases of compliance, beginning with monitoring at 180 days and full implementation after 1 year, as described in Unit V.A.1. of the 2023 TCE proposed rule.

As required under TSCA section 6(c)(2)(A)(iv)(II) through (III), EPA presented its consideration of an alternative regulatory action in the Unit V.B. of the 2023 TCE proposed rule. Similar to the proposed regulatory action, the alternative regulatory action combined prohibitions with requirements for a WCPP for certain conditions of use before they would be prohibited, to address the unreasonable risk from TCE under its conditions of use. The primary alternative regulatory action described in the proposed rule differed from the proposed regulatory action by providing longer timeframes for prohibitions, and by describing an ECEL based on a different health endpoint (i.e., immunotoxicity), as part of the WCPP that would be required for the conditions of use of TCE that would be permitted to continue for longer than one year after publication of the final rule until the prohibition compliance dates. The ECEL for the WCPP under the

proposed rule's primary alternative regulatory action was based on the endpoint used for EPA's unreasonable risk determination for TCE under TSCA (*i.e.*, immunotoxicity (Ref. 2)). In contrast, the ECEL for the WCPP under the proposed regulatory action was based on the most sensitive health endpoint (developmental toxicity). The rationale for these differences is discussed in Unit V.A. of this rule and Unit VI.A.1.a. of the 2023 TCE proposed rule.

For a comprehensive overview of the alternative regulatory action, refer to Unit V.B. of the 2023 TCE proposed rule, with the rationale for the primary alternative regulatory action provided in Unit VI.B. of the 2023 TCE proposed rule.

4. Public Comments Received

EPA requested comment on all aspects of the 2023 TCE proposed rule. During the public comment period, EPA held a webinar on November 14, 2023, providing an overview of the proposed rule and TSCA section 6; during the webinar, members of the public had the opportunity to share their perspectives (Ref. 26). The comment period closed on December 15, 2023. EPA received almost 30,000 public comments, with a vast majority received from individuals participating in mass mailer campaigns organized by non-governmental organizations. The public comments also include approximately 200 unique comments from industry stakeholders, trade associations, environmental groups, unions, non-governmental health advocacy organizations, academics, State and local governments, and members of the regulated community. A summary of the comments, as well as EPA's responses, is in the docket for this rulemaking (Ref. 11). Additionally, Unit III. contains summaries of public comments that informed EPA's regulatory approach in this final rule.

After the close of the public comment period for the proposed rule, EPA held meetings with stakeholders to receive clarifying information on their comments, including affected industry and interested groups, related to the use of TCE. Topics of these meetings included exposure controls, process descriptions, monitoring data, and specific conditions of use. EPA received data as part of and following these stakeholder meetings and has made the information available to the public in the rulemaking docket (EPA–HQ–OPPT–2020–0642) (Ref. 27).

After review of the public comments received from the 2023 TCE proposed rule, EPA revised certain preliminary considerations that impacted the length of time-limited exemptions from prohibition under TSCA section 6(g) and key provisions of the WCPP (including identification of a new, interim ECEL), among other changes. Similarly, based on public comments received, EPA modified for this final rule several proposed compliance timeframes, with details provided in Unit III. of this final rule.

III. Changes From the Proposed Rule

This unit summarizes the main changes from the 2023 TCE proposed rule to the final rule, based on the consideration of the public comments.

A. Changes to the WCPP

As part of the conditions for exemptions under TSCA section 6(g) or phase-outs for several conditions of use before prohibition, EPA proposed to require owners or operators to comply with a WCPP to reduce exposures and risks to potentially exposed persons. Numerous commenters expressed concern regarding the requirements of the WCPP. While EPA is finalizing as proposed many aspects of the WCPP, the final rule includes several significant changes, based on consideration of public comments. The details of and rationale for these changes are described in this Unit and EPA notes that in the event that sensitive information relating to national security or critical infrastructure is submitted to EPA, the Agency will protect such information in accordance with applicable authorities.

1. Interim Occupational Exposure Limit

EPA proposed requirements to comply with the TCE WCPP for all conditions of use that would continue for one year or more before prohibition, as an interim measure to reduce exposures to TCE in the workplace. As part of the TCE WCPP, EPA proposed that each owner or operator of a workplace subject to the TCE WCPP ensure that no person is exposed to airborne concentrations above the occupational exposure limit to the extent possible. EPA proposed an existing chemical exposure limit, or ECEL, of 0.0011 ppm as an 8-hour TWA. In proposing to set this risk-based exposure limit, EPA described in Unit IV.A. of the 2023 TCE proposed rule how the ECEL is based on developmental toxicity, the most sensitive acute and chronic non-cancer health endpoint, specifically calculated based on the occupational acute, non-cancer human equivalent concentration for fetal cardiac defects (Ref. 28).

EPA also described in Unit V.A.2. of the 2023 TCE proposed rule how a WCPP provides regulated entities with some flexibility in the manner in which they implement modifications, within certain parameters, or otherwise aim to prevent exceedances of inhalation exposure limits at their facilities. EPA proposed or finalized a WCPP for several conditions of use for other chemicals regulated under TSCA section 6, such as methylene chloride (89 FR 39254, May 8, 2024 (FRL–8155–01–OCSPP)), perchloroethylene (PCE) (88 FR 39652, June 16, 2023 (FRL–8329–02–OCSPP)), and carbon tetrachloride (88 FR 49180, July 28, 2023) (FRL–8206–01–OCSPP)). The proposed TCE WCPP differed from those other proposals in two key ways. First, EPA intended for the TCE WCPP to be in place only as an interim measure before prohibitions take effect (rather than continuing in perpetuity, as was the case in the other proposed rules cited previously). Second, for the reasons described in Unit VI. of the 2023 TCE proposed rule, the proposed rule, including the challenges of reliably reducing exposure below the ECEL and being able to monitor at the appropriate action level, EPA's proposed requirement for the TCE WCPP was that owners or operators ensure that no person is exposed to TCE in excess of the ECEL of 0.0011 ppm as an 8-hr TWA *to the extent possible* rather than (as has been proposed in other rules under TSCA section 6) a requirement that exposures *do not exceed* the ECEL. Due to these challenges in reducing exposure, as well as the severity of the hazard from TCE, EPA emphasizes that, even with the proposed ECELs, EPA cannot ensure that TCE does not present unreasonable risk to workers and, therefore, it is not a substitute for a ban as a long-term risk management solution. Thus, prohibition of all conditions of use ultimately is necessary to address the unreasonable risk.

In the 2023 TCE proposed rule, EPA requested comment on the proposed ECEL (including the feasibility of the limit, the associated action level of 0.00055 ppm as an 8-hr TWA, monitoring methods, and whether a phased approach is desirable). EPA also requested comment on the ECEL described in the alternative regulatory action (0.004 ppm as an 8-hr TWA, based on the immunotoxicity endpoint).

Numerous commenters expressed concern that EPA proposed that compliance with the WCPP would be measured by reaching and documenting the lowest exposure level that could be achieved, instead of a requirement to meet an exposure limit (Refs. 29, 30,

and 31). Additional commenters stated it would not be technically feasible to meet the proposed ECEL (Refs. 32, 33), despite what they described as robust implementation of engineering and administrative controls (Refs. 34, 35). These and other commenters described how they are not aware of any additional feasible engineering or administrative controls that would enable them to avoid, under the TCE WCPP, having employees wear supplied-air respirators at all times (Refs. 34, 35, 36, 37). Commenters expressed several concerns with requiring employees to wear supplied-air respirators at all times (Refs. 34, 35). Industry commenters requested a higher interim occupational exposure limit that would not require an unworkably burdensome level of PPE; commenters provided numerous suggestions for alternate ECEL values such as 0.36 ppm, 5 ppm, or 6 ppm, each expressed as 8-hr TWAs (Refs. 38, 39, 40, 41). Commenters offered these alternate occupational exposure limits based on either their current monitoring or on regulatory values set in other countries, to reduce reliance on extensive respiratory PPE. Commenters noted that setting an ECEL at the level proposed level or at the alternative regulatory action ECEL would require potentially exposed persons across all industries to use high levels of respiratory protection that EPA acknowledges can represent an occupational hazard on its own. EPA recognizes the challenges of respiratory PPE. As detailed in the proposed rule in Unit VI.A.1.b., and in OSHA's 1998 final rule to update its respiratory protection standard, which cited communication problems, vision problems, worker fatigue, and reduced work efficiency among such challenges. (63 FR 1152, January 8, 1998). As OSHA explained, "improperly selected respirators may afford no protection at all (for example, use of a dust mask against airborne vapors), may be so uncomfortable as to be intolerable to the wearer, or may hinder vision, communication, hearing, or movement and thus pose a risk to the wearer's safety or health." (63 FR 1189 through 1190).

In addition to describing anticipated challenges in meeting the proposed or the alternative regulatory action ECEL, commenters also described the challenges they would expect in attempting to monitor indoor air TCE concentrations at or below the ECEL and ECEL action level of 0.00055 ppm or the alternative ECEL and alternative ECEL action level of 0.0002 ppm. Specifically, several commenters emphasized that laboratories would need to transition from typical methods that use sorbent tubes and sample media solvent desorption (OSHA Method 1001) to a more sensitive method that may involve a completely different approach, such as a relevant EPA Compendium Method, and that these may still not be sufficient due to a level of detection of volatile organic compounds above 0.5 parts per billion by volume (ppbv), which is above the proposed ECEL action level (Refs. 38, 39, 42). The commenters also discussed the EPA TO–17 Method, which uses a sorbent tube/thermal desorption/gas chromatographic-based monitoring method for VOCs, but emphasized the use of thermal desorption is not common across the industry (Refs. 38, 39). EPA agrees that while available monitoring and analytical methods for TCE are possible in the low parts-per-billion range, typical occupational sampling methods such as OSHA method 1001 (*i.e.*, personal breathing zone monitoring) used in industrial hygiene generally allow detection in the 10 to 100 ppb range (or 0.010 ppm to 0.100 ppm) (Ref. 38). Widespread adoption of monitoring and sampling methods that could meet a TCE ECEL in the low parts-per-billion range would be difficult, expensive, and take at least several years. Public commenters specifically requested the option to be able to use methods common in occupational sampling, both for familiarity and from a commercial lab capacity perspective, and pointed out the proposed ECEL would not provide that ability (Ref. 38). Additionally, setting a regulatory occupational exposure limit at 0.0011 ppm would be incompatible with the NIOSH-recommended best practice of monitoring to a fraction (specifically 10%) of the occupational exposure limit in order to quantify results, because 0.0011ppm is significantly lower than the detection limits of available monitoring and analytical methods for TCE.

One commenter, a union, stated that setting an ECEL at a level that cannot be measured would render the rule unenforceable and would therefore be meaningless for employees continuing to work with TCE during the phase-out period (Ref. 29). Another commenter, an industry trade organization, asserted that lowering exposures "to the extent possible" is unenforceable (Ref. 43). Based on the significant feasibility challenges described by commenters; the need for a robust, implementable, and enforceable WCPP for conditions of use that would continue for more than a year before prohibition; EPA's strong interest in rapidly putting into place the TCE WCPP and resulting exposure reductions; and the forthcoming future prohibitions that will take effect on these conditions of use, EPA is finalizing an interim ECEL of 0.2 ppm as an 8-hr TWA with an associated interim ECEL action level of 0.1 ppm as an 8-hr TWA. This occupational exposure level is achievable to meet, can be reliably and consistently monitored, and will provide an interim level of protection for conditions of use with longer timeframes until prohibition.

Several commenters supported the risk-based exposure limit that was proposed, and stated that, in their view, it is supported by sound scientific evidence (Refs. 31, 44, 29, 45). The proposed ECEL is based on data presented in the risk evaluation, which is the best available science. EPA emphasizes that modifying the final TCE WCPP to include an interim ECEL does not diminish the scientific rationale for the risk-based exposure limit that EPA proposed. EPA's justification for identification of the ECEL that would address unreasonable risk as 0.0011 ppm as an 8-hr TWA is described in detail in the notice of proposed rulemaking and highlighted section 5 of the Response to Comments document (Ref. 11). EPA also emphasizes that this interim ECEL is specific to TSCA and incorporates different considerations than limits or levels set for TCE exposures in other contexts or inhalation exposures that are regulated under other authorities, such as RCRA. EPA's action to finalize an interim ECEL for TCE under TSCA is based on feasibility considerations during ongoing occupational use of TCE beyond one year. Specifically, the interim ECEL takes into account significant challenges potentially exposed persons would experience from extensive respiratory PPE use in an occupational setting.

EPA is finalizing an interim ECEL of 0.2 ppm as an 8-hr TWA. This interim ECEL takes into account considerations raised by the commenters, such as feasibility of implementation in several critical or essential industries. Specifically, EPA expects that the various industries subject to the interim ECEL can meet the interim ECEL with exposure controls that are feasible for owners and operators to implement for potentially exposed persons over a full shift, using engineering controls and, in some instances, respiratory PPE. While certain supplied air respirators could be used to reduce exposures below the proposed exposure limit, these respirators are burdensome and EPA is

not confident that they could be effectively and consistently implemented on an ongoing basis in a way that fully addresses the unreasonable risk. EPA views extremely high levels of PPE (*e.g.*, assigned protection factor (APF) 10,000) as unable to consistently and over a long timeframe address occupational risk. As noted earlier, setting an ECEL at the level proposed would require potentially exposed persons across all industries to use high levels of respiratory protection, such as APF 10,000 supplied air respirators, that EPA acknowledges could represent an occupational hazard on its own due to communication problems, vision problems, worker fatigue, and reduced work efficiency. The interim ECEL allows for more robust use of the hierarchy of controls.

The interim ECEL was also developed with consideration for risk reduction and health protectiveness. EPA estimates that the 0.2 ppm interim ECEL would reduce estimated baseline chronic workplace exposure by 97% (Ref. 28). The reduction in the baseline excess cancer risk is estimated to be proportional to the reduction in exposure. Acute health effects would also be reduced to the extent that they are proportional to exposure reduction. For example, based on EPA's TSCA TCE risk evaluation, the 0.2 ppm interim ECEL is protective of the acute immunotoxicity endpoint.

Lastly, the interim ECEL allows for occupational monitoring methodologies based on validated active, passive, and direct-read instrumentation. There are several available active sampling methods (*e.g.*, OSHA 1001, OSHA 5000) that are fully validated methods that readily allow for compliance with the interim ECEL value of 0.2 ppm for all affected industries. As described elsewhere in this preamble, this rule is also finalizing an interim ECEL action level that serves as a trigger for certain compliance activities (*e.g.*, periodic monitoring). Therefore, it is important for regulated entities to be able to reliably and accurately measure both the interim action level and the interim ECEL value. The interim ECEL also enables use of the NIOSH 1003 (active sampling) method as well as field portable instruments that use the NIOSH 3701 method for occupational monitoring. While real-time monitoring with a digital measure device is not required for rule compliance, EPA understands the practical benefits of field portable and/or real-time occupational exposure monitoring. In the near term, the interim ECEL and the associated interim action level aids with implementation of the WCPP from the perspective of monitoring methodology and availability. Setting the interim ECEL at a value of 0.2 ppm allows for the immediate implementation of the WCPP, as monitoring methods are currently available and widely recognized and used. A lower value interim ECEL would pose technical challenges (*i.e.*, achievable with only a subset of monitoring methods) and be less feasible.

EPA emphasizes that the regulatory limit adopted in this final rule (0.2 ppm as an 8-hr TWA) will be a significant reduction from the current regulatory occupational exposure limit (*i.e.*, 500 times lower than the current OSHA PEL of 100 ppm as an 8-hr TWA) as well as more than 50 times lower than the voluntary standard frequently cited by commenters (10 ppm as an 8-hr TWA). EPA expects that regulated entities may need to make significant, but feasible, changes from current practice by adopting the WCPP to reduce inhalation exposures sufficiently and provide risk reduction to potentially exposed persons. EPA also recognizes that the interim ECEL of 0.2 ppm as an 8-hr TWA does not fully address the unreasonable risk from TCE, hence, the term "interim." Potentially exposed persons may continue to be at risk for the developmental and immunotoxicity effects that provide the basis for EPA's ultimate prohibition. Given the risk profile for TCE, EPA is addressing the unreasonable risk through prohibition, and acknowledging the critical or essential nature of several conditions of use affected by providing reasonable timeframes and time-limited exemptions for a TCE prohibition. A WCPP including the interim ECEL will be required as an interim measure for each of the conditions of use listed in Unit IV.C.

The requirement to meet an interim ECEL for the conditions of use for which EPA is finalizing exemptions under TSCA section 6(g) is supported by TSCA section 6(g)(4), which states that "the Administrator may impose conditions that are necessary to protect health and environment while achieving the purposes of the exemption." EPA has determined the interim ECEL of 0.2 ppm is a condition that, as explained in this Unit, allows for implementation and monitoring feasibility, thus achieving the purposes of the exemption, while providing health protectiveness for potentially exposed persons during the duration of the TSCA section 6(g) exemptions. As a condition of the exemption, it protects health by reducing exposure and thus risk significantly: as stated previously, the interim ECEL will reduce estimated baseline chronic workplace exposure by 97%.

For the conditions of use that continue for more than one year subject to the interim ECEL but for which there is no TSCA section 6(g) exemption, EPA also finds that the interim ECEL of 0.2 ppm and interim action level of 0.1 ppm are necessary to reduce the risk during the TSCA section 6(d) timeframe for those conditions of use. Throughout the proposed rule and this final rule, EPA has emphasized the high risk posed by TCE. Due to this risk, the proposed health protective air exposure concentration (proposed ECEL) was so low that facilities would encounter significant difficulty mitigating occupational exposures to this level. Based on information in the 2020 Risk Evaluation (Ref. 1) and on the extensive public comments, facilities would need to augment their existing controls with unreasonably extensive use of burdensome PPE. EPA determined reliance on extreme respiratory protection measures is unlikely to mitigate the occupational risk of TCE, a view corroborated by commenters. In particular, commenters noted that air supplied respirators would present health and safety concerns for workers due to their weight, bulk, impairment of hearing and vision, and interference with use of other safety equipment (Refs. 34, 46, 29). Respiratory protection is considered a last resort because respirators cannot be worn by all persons, are not suitable for all situations, and due to worker discomfort and fatigue, cannot be worn for long periods of time. In addition, as discussed in this Unit, compliance with the WCPP would be challenging; while specialized monitoring and analytical methods are available for TCE in the low parts-per-billion range, typical methods allow for detection in the 10 to 100 ppb (0.01 to 0.1 ppm) range. As a result, EPA determined that any measures short of prohibition are insufficient to address the unreasonable risk from TCE.

2. Worker Protection Measures for Workers Disposing of TCE in Wastewater to Industrial Pre-Treatment, Industrial Treatment, or Publicly Owned Treatment Works

EPA proposed requirements to comply with the TCE WCPP for all conditions of use that would continue for one year or more before prohibition, as an interim measure to reduce exposures to TCE in the workplace. As discussed in Unit III.A.1, numerous commenters stated it would not be technically feasible to monitor to or

meet the proposed ECEL. Commenters emphasized that for wastewater disposal, unlike a typical workplace where a WCPP could apply, work at a cleanup site happens so intermittently that a regular monitoring program would be extremely difficult to develop, requiring owners and operators to implement sampling every time they were in the field. Additionally, the WCPP requires additional monitoring to occur after a change in workplace conditions as a commenter pointed out, which could create a requirement for constant monitoring because cleanup sites are dynamic systems (Ref. 43). In particular regarding the feasibility of compliance with the WCPP, commenters associated with wastewater disposal described that even with the maximum available engineering controls, workers would have to rely on PPE of APF 10,000 to meet the proposed ECEL at cleanup sites (Ref. 47).

As stated in Unit III.A.1, EPA recognizes the challenges of high levels of respiratory protection which include, as described by OSHA, communication problems, vision problems, worker fatigue, and reduced work efficiency. Commenters involved in wastewater cleanup operations were among those who submitted public comments in favor of an interim exposure level that could be reliably measured using current analytical methods (Ref. 33). Additionally, these commenters emphasized that existing RCRA permits require HAZWOPER training for all employees who are exposed or potentially exposed to hazardous substances at cleanup sites. The HAZWOPER standard is a set of established policies, practices, and procedures found in 29 CFR 1910.120. This standard is designed to protect workers who may be exposed to hazardous substances resulting from uncontrolled releases such as natural disasters, equipment malfunctions, or other emergencies (Ref. 48). Operations that fall within the scope of the HAZWOPER standard include cleanup operations required by a government body and corrective actions involving hazardous waste and sites covered by RCRA. Commenters also provided information to EPA on the variety of remediation methods used for TCE contaminated water and groundwater, noting a difference between *ex situ* treatment systems that remove TCE-contaminated groundwater from the ground, and *in situ* treatment systems that remediate the groundwater in its place (Ref. 35). A commenter requested that the HAZWOPER standard, currently implemented at thousands of clean-up sites, should continue to be used instead of EPA's proposed WCPP (Ref. 45). Cleanup sites are dynamic systems that often involve multiple chemical contaminants, and EPA agrees with commenters that the structure and procedures under the HAZWOPER standard are best suited for the unique worker protection scenarios at cleanup sites. However, OSHA's PEL for TCE is 100 ppm as an 8-hour time-weighted average. See 29 CFR 1910.1000, Table Z–2. As discussed in the proposed rule, the OSHA PEL has not been changed since the 1970s (Ref. 49).

For the purposes of the TSCA section 6(g) exemption from prohibition for 50 years for disposal of TCE to industrial pre-treatment, industrial treatment, or publicly owned treatment works for the purposes of facilitating cleanup projects of TCE-contaminated water and groundwater, based on public comments and coordination across Federal programs, EPA has determined it is appropriate that owners and operators of cleanup sites where potentially exposed persons are involved in the disposal of TCE-contaminated water or groundwater for the purposes of cleanup projects of TCE-contaminated water and groundwater, including industrial pre-treatment and industrial treatment activities, must ensure that potentially exposed persons involved with the activity of removing the contaminated water or groundwater from the location where it was found and treating the removed contaminated water or groundwater on site continue to comply with HAZWOPER requirements but with exposures for potentially exposed persons limited to the interim ECEL for TCE (0.2 ppm as an 8-hr TWA, for reasons discussed in Unit III.A.1.). Specifically, EPA has determined that at cleanup sites, the TCE interim ECEL would apply to any potentially exposed person involved in the disposal of TCE-contaminated water or groundwater to industrial treatment, industrial pre-treatment, or POTWs. A potentially exposed person most likely includes a person who is involved with the activity of removing TCE-contaminated water or groundwater from the location where it was found and the on-site treatment of the TCE-contaminated water or groundwater. EPA generally considers workers in and around those locations to be potentially exposed persons as that term is defined is 40 CFR 751.5. For example, EPA's requirements would apply to protect workers conducting remediation through pump and treat systems or workers sampling groundwater in conjunction with extraction or treatment (*e.g.*, remediation or cleanup) activities. EPA considers treatment activities that are performed at the cleanup site on TCE-contaminated wastewater that has been removed from the subsurface, surface water impoundments, or aquifers, and that are recognized as industrial treatment, industrial pretreatment, or discharge to a POTW to be covered under the provisions described in this unit. To further clarify, the workplace protections for this exemption are not intended to cover potentially exposed persons who may be exposed to TCE from other contaminated media. Additionally, the workplace protections for this exemption are not intended to cover potentially exposed persons who are sampling groundwater to monitor the presence of a plume, but specifically only those sampling wastewater at the site of extraction and active treatment activities. EPA also notes that while the cross-referenced OSHA regulations do not require the establishment of regulated areas, the OSHA regulations do suggest excluding non-essential persons during certain operations as a feasible work practice control.

For cleanup sites involved in the disposal of TCE-contaminated water or groundwater to industrial treatment, industrial pre-treatment, or POTWs, rather than implementing the monitoring, notification, and exposure control plan requirements of the WCPP, in light of the special circumstances of these sites, and the likely presence of multiple contaminants, EPA is requiring compliance with the current requirements in 29 CFR 1910.120 (HAZWOPER) except that for those provisions in 29 CFR 1910.120 that reference a PEL, owners and operators will instead comply with the TSCA interim ECEL. EPA's requirement for cleanup sites to meet specific existing OSHA health and safety requirements in 29 CFR 1910.120 combined with EPA's interim ECEL differs from the requirements for the WCPP that will be in effect in other workplaces. EPA emphasizes that this standard is only for cleanup sites involved in the disposal of TCE contaminated groundwater and wastewater from cleanup sites under the applicable condition of use and that no other remedial actions at cleanup sites will be covered or affected. More specifically, EPA notes that this rule only includes within its scope remediation methods that would be considered industrial wastewater pretreatment, industrial wastewater treatment or discharge to a POTW. As such, a remediation method would need to be considered one of these three types of disposal to fall within this condition

of use under TSCA, and if not would not be subject to the prohibition or other requirements of the rule.

Similarly, some commenters asked EPA to clarify what responsibility the receiver of waste, specifically POTWs, would have regarding compliance with the WCPP and highlighted the challenges of the WCPP in the context of POTWs, some of which may be outdoors and thus unable to demarcate a regulated area in a straightforward way (Refs. 35, 45). EPA emphasizes that disposal of TCE-containing wastewater to and from POTWs is within the disposal condition of use. As exposures to TCE are likely to continue in POTWs for the duration of the exemption for TCE disposal under TSCA section 6(g) for industrial pre-treatment, industrial treatment, or POTWs for the purposes of cleanup projects of TCE-contaminated water and groundwater, and as EPA is interested in reducing to the extent possible exposures to TCE during the time period of this exemption, EPA proposed the WCPP as an appropriate measure. However, under the proposal, the ECEL was so low that, as one commenter stated, "receivers of groundwater from cleanup sites would be forced to assume that TCE is present, since it is not currently possible to measure down to the ECEL" (Ref. 45).

Even with a new interim ECEL, based on the public comments and information reasonably available to the agency, EPA recognizes that POTWs have more experience in water monitoring. As an example, commenters described that TCE is measured in wastewater at POTWs as water concentrations, not ambient air levels. Commenters described regular water monitoring schedules of the concentration of TCE in wastewater at the POTWs to which they disposed (Refs. 36, 50, and 51). For this reason, in the final rule, POTW's must comply with either solely the WCPP, or a water monitoring structure already more familiar and implementable for POTWs as the initial screening before the WCPP in the interim until prohibition.

To ease monitoring implementation, EPA has determined that POTWs that can reasonably expect TCE to be present, because of existing industrial users discharging into the POTW, will be able to determine the need to comply with the WCPP by conducting an initial screening of their wastewater. This approach follows EPA's 1992 "Guidance to Protect POTW Workers from Toxic and Reactive Gases and Vapors" (Ref. 52) which sets wastewater screening levels for toxic chemicals using Henry's Law constants to translate toxicity-based air exposure concentrations to wastewater concentrations. This monitoring approach also is consistent with water screenings described by several public commenters (Refs. 36, 50, 51). The methodology assumes that wastewater and air are in equilibrium, *e.g.*, that the system is closed and water agitation is negligible; that temperature is defined and constant; and that other constituents in the wastewater do not affect a chemical's volatilization to air.

The water screening requirement that EPA is finalizing follows the methodology in the 1992 guidance, using the Henry's Law constant for TCE (378 $(mg/m^3)/(mg/L)$ at 25 °C) to calculate a screening level for TCE in wastewater, 0.00284 mg/L, that corresponds to the interim ECEL (0.2 ppm). This screening level is a level specific to TSCA, to regulate unreasonable risk to workers performing wastewater disposal that are exposed to TCE. This differs from maximum contaminant levels (MCLs) which regulate public water systems under a different federal statute and do not address exposures to TCE through wastewater. While the screening level is lower than the current enforceable MCL for TCE (0.005 mg/L), the values are within a factor of 2. EPA believes that the conservative assumptions used to derive 0.00284 mg/L are appropriate here because this is a screening approach, and the TCE occupational exposure profile of wastewater workers may be variable.

If the concentration of TCE in wastewater received by a POTW is less than or equal to the screening level, the POTW can assume that the concentration of TCE in air that results from TCE volatilization from wastewater is equal to or less than the interim ECEL. If a POTW's water screening detects TCE in wastewater at a concentration greater than 0.00284 mg/L of TCE, then the WCPP is required. More information is in Unit IV.E.

3. Exposure Monitoring Requirements

As part of the WCPP, EPA proposed to require that owners or operators meet certain documentation requirements for each instance of monitoring of TCE, including compliance with the Good Laboratory Practice (GLP) Standards in accordance with 40 CFR part 792.

Numerous commenters expressed concern regarding the requirement that the WCPP include compliance with the GLP Standards at 40 CFR part 792. Commenters stated that it is atypical to use this standard for air sampling of TCE for industrial hygiene purposes (Refs. 39, 38). According to the commenters, it is common practice within the industrial hygiene community to have analyses performed by American Industrial Hygiene Association (AIHA) accredited labs (Refs. 38, 39). A commenter further reasoned that because labs in the United States are certified by International Organization for Standards (ISO) and the International Electrochemical Commission (IEC) standard 17025 (Testing and Calibration Laboratories), a standard that differs from the proposed GLP, they recommended that provisions of monitoring results and recordkeeping in the final rule be allowed from any accredited laboratory, without regard to a specific type (Refs. 38, 39).

EPA agrees with the commenters that the WCPP for TCE is incompletely served by solely relying on the GLP standard as proposed. EPA has considered laboratory capacity concerns raised by some commenters (*i.e.*, that potential increases in demand for professional safety services and sampling laboratories may strain the broader availability of laboratory service and result in sampling limitations (Refs. 38, 39), and agrees that sufficient infrastructure must be in place to ensure that the regulated community can successfully implement the WCPP while TCE use is ongoing. For the final rule, EPA is requiring that exposure samples be analyzed using an appropriate analytical method by a laboratory that complies with the GLP Standards in 40 CFR part 792 or that otherwise maintains a relevant third-party laboratory accreditation (*e.g.*, under the AIHA Laboratory Accreditation Programs, LLC Policy Module 2A/B/E of Revision 17.3) or other analogous industry-recognized programs. The laboratory must also retain related records.

Another commenter noted that EPA's proposal did not make clear that "personal breathing zone" air samples to monitor occupational exposures are to be taken without regard to respirator use. More specifically, the commenter pointed to the importance of EPA being explicit that occupational monitoring only occurs in the absence of respiratory protection (Ref. 29). EPA agrees with the commenter that exposure monitoring should be conducted to reflect ambient occupational conditions (*i.e.*, without respiratory protection) to best inform engineering control options and respiratory protection considerations for potentially exposed persons. Therefore, the final rule now explicitly states that occupational air sampling is required to measure ambient concentrations for TCE without taking respiratory protection into account when air sampling is performed. This will ensure the highest degree of protection to potentially

exposed persons by requiring measurement of ambient air concentrations of TCE, thus empowering owners or operators to appropriately consider the hierarchy of controls.

Additionally, as part of the WCPP, EPA proposed to require owners and operators to re-monitor within 15 working days after receipt of any exposure monitoring if results indicated non-detect or air monitoring equipment malfunction, unless an Environmental Professional, as defined at 40 CFR 312.10, or a Certified Industrial Hygienist reviews the monitoring results and determines re-monitoring is not necessary. EPA received several comments disagreeing with the proposed requirement to review non-detect air monitoring samples. The commenters stated that the requirement is inconsistent with OSHA rules, is an unnecessary step that adds no value to reduce risk to workers, and could be costly, especially for smaller companies (Refs. 53, 54, 55, 47, 56, 57, 58). One commenter suggested that EPA incorporate a six-sample rolling average as the statistical evaluation would incorporate ongoing validation of exposure levels for a particular task and thus remove any need for resampling based on a non-detect result.

EPA disagrees with commenters that expressed the opinion that re-evaluating non-detect results adds no value and is inappropriate. A sampling result that is non-detectable does not necessarily imply negligible occupational exposure to the chemical. A non-detect result is indicative that the chemical was not detected by the particular sampling and analytical procedures used at the time of sampling. Multiple factors can contribute to a non-detect result. For example, the chemical may simply not be present in appreciable quantities. An alternative possibility is that the chemical is present at a level below the limit of detection for the particular sampling and analytical method used. Depending on the chemical and ambient conditions, interference from another chemical during occupational sampling sometimes results in an incorrect reporting of non-detectable levels. This interference may or may not be known by the owner or operator at the time of sampling, or by the laboratory at the time of analysis. It is also possible that the owner's or operator's sampling technique or the laboratory's analytical procedure was not particularly effective, or that the chosen sampling and analytical method was not very efficient or precise for the particular chemical of interest. Therefore, re-evaluating non-detectable sampling results is often appropriate and desirable. In each of the examples described in this paragraph, a nondetectable sampling result, along with supporting documentation about the sampling and analytical method used to get that result, is a meaningful part of the potentially exposed person's exposure record required under the WCPP. Monitoring results from malfunctioning air monitoring equipment are not valid monitoring and require resampling consistent with § 751.315(b)(3)(i)(A) through (D).

The provisions proposed for the WCPP did not require re-monitoring in all cases. Re-monitoring may not be necessary based on a professional evaluation by an Environmental Professional as defined at 40 CFR 312.10 or a Certified Industrial Hygienist. The final rule provides flexibility in the event of a non-detect by allowing owners or operators to either re-monitor or seek a determination from a qualified professional that re-monitoring is not necessary. From an owner and operator's perspective, a non-detect sampling result—when effective sampling and analysis procedures are used—is valuable because it suggests effective implementation of exposure controls. Potentially exposed persons may also use these records in discussions with owners and operators, in collective bargaining situations, or in compliance assistance inquiries to EPA or other federal agencies. Exposure monitoring results may also improve overall workplace health and reduce owner and operator liability through effective detection, treatment, and prevention of occupational disease or illness. All of these scenarios are valuable for owners and operators, potentially exposed persons, and for effective mitigation of occupational exposures. In consideration of these factors, EPA has removed the air monitoring equipment malfunction from the monitoring activities that do not require resampling based on professional evaluation by an Environmental Professional or Certified Industrial Hygienist. While professional discretion may be warranted in determining whether re-monitoring is needed following results that indicate non-detect, EPA has determined this discretion is not appropriate in the event of air monitoring equipment malfunction, which warrants re-monitoring. This is due to the importance of air monitoring in ensuring that the requirements of the WCPP are met, and the importance of the WCPP in reducing risks from exposures to TCE in the workplace. Monitoring results from malfunctioning air monitoring equipment are not valid monitoring.

Additionally, while statistical methods may be useful in establishing and analyzing an occupational monitoring program, EPA determined that information presented in support of amending the evaluation of re-monitoring to rely on six sample rolling average of exposure measurements in place of the proposal is not persuasive, as discussed in detail in section 5.5.3 of the Response to Comments document (Ref. 11). Occupational monitoring (and associated recordkeeping) is a topic on which EPA may develop guidance as part of final rule implementation efforts.

Therefore, based on consideration of public comment, EPA is finalizing as proposed with slight modification the requirement to re-monitor within 15 working days after receipt of any exposure monitoring if results indicated non-detect, unless an Environmental Professional, as defined at 40 CFR 312.10, or a Certified Industrial Hygienist reviews the monitoring results and determines re-monitoring is not necessary. EPA has modified the re-monitoring recordkeeping requirement to clarify what would suffice as justification for when re-monitoring is not necessary, and has therefore updated the recordkeeping requirements associated with the WCPP exposure records required under 40 CFR 751.319(b)(1). EPA has also removed air monitoring equipment malfunction from the monitoring activities that do not require resampling if determined unnecessary by an Environmental Professional or Certified Industrial Hygienist.

EPA proposed to require under the WCPP that each owner or operator conduct additional exposure monitoring whenever a change in the production, process, control equipment, personnel, or work practices may reasonably be expected to result in new or additional exposures at or above the ECEL action level, or when the owner or operator has any reason to believe that new or additional exposures at or above the ECEL action level occurred. In the event of start-up, shutdown, spills, leaks, ruptures, or other breakdowns that may lead to employee exposure, EPA proposed to require that each owner or operator conduct additional initial exposure monitoring to potentially exposed persons (using personal breathing zone sampling) after the cleanup of the spill or repair of the leak, rupture, or other breakdown. EPA is finalizing that requirement, with a compliance timeframe requiring that this type of additional exposure monitoring must be conducted within

30 days (see Unit IV.C.4.d.), which is a change from the proposed rule, in which a timeframe was not specified.

4. Designated Representatives

As part of the WCPP, EPA proposed to require that owners and operators (*i.e.*, any person who owns, leases, operates, controls, or supervises a workplace covered by the rule) provide potentially exposed persons or their designated representatives regular access to the exposure control plans, exposure monitoring records, and PPE program implementation and documentation. Additionally, EPA proposed to require that owners or operators document the notice to and ability of any potentially exposed person who may reasonably be affected by TCE exposure to readily access the exposure control plans, facility exposure monitoring records, PPE program implementation, or any other information relevant to TCE inhalation exposure in the workplace.

EPA solicited and received public comments on the role of designated representatives in the WCPP. One commenter, a group of labor unions, urged EPA to incorporate requirements similar to OSHA's access standard at 29 CFR 1910.1020 (entitled, "Access to employee exposure and medical records") to ensure that exposure information is promptly and fully shared with both potentially exposed persons and their designated representatives (Ref. 29). The commenter also suggested that EPA include a requirement that employers provide employees and their designated representatives an opportunity to observe monitoring events. The commenter observed that workers and their designated representatives have a critical role to play in ensuring effective control of toxic substances and further noted that, often, unions are the organizations with expertise in understanding occupational exposure information.

EPA recognizes the importance of having the ability for potentially exposed persons and their designated representative(s), such as labor union representatives, to observe exposure monitoring and have prompt access to exposure records. EPA additionally recognizes that, in some instances, individual workers may be hesitant to ask owners or operators for information relating to their chemical exposure or may be less familiar with discipline-specific industrial hygiene practices. EPA determined that it is appropriate in this final rule to revise, to some extent, the requirements regarding designated representatives included in the proposed rule, consistent with existing OSHA precedent in certain 29 CFR part 1910, subpart Z regulations, to allow designated representatives the ability to observe occupational exposure monitoring and have access to exposure monitoring records. The WCPP provisions of the final rule include a requirement that owners and operators provide potentially exposed persons or their designated representatives an opportunity to observe any exposure monitoring that is designed to characterize their exposures and is conducted under the WCPP. With respect to facilities classified in the interest of national security, only persons authorized to have access to such facilities must be allowed to observe exposure monitoring.

The final rule also requires that designated representatives have access to relevant exposure records, similar to provisions in certain OSHA regulations under 29 CFR part 1910, subpart Z, such as 29 CFR 1910.1020. EPA is requiring owners and operators to notify potentially exposed persons and their designated representatives of the availability of the exposure control plan and associated records of exposure monitoring and PPE program implementation within 30 days of the date that the exposure control plan is completed and at least annually thereafter.

EPA's definition of "designated representative" in 40 CFR 751.5 was established in the recently promulgated final rule under TSCA section 6(a) that addresses the unreasonable risk presented by PCE (RIN 2070–AK84). This term means any individual or organization to whom a potentially exposed person gives explicit, written authorization to exercise a right of access. A recognized or certified collective bargaining agent must be treated automatically as a designated representative without regard to written authorization, analogous to OSHA requirements set forth in 29 CFR 1910.1200. Additionally, with respect to Federal Government employees, EPA, like OSHA at 29 CFR 1960.2(e), will interpret these designated representative requirements consistent with the Federal Service Labor Management Relations Statute (5 U.S.C. 71), or collective bargaining or other labor-management arrangements that cover the affected employees.

Should a request be initiated for such records by the potentially exposed person or their designated representative(s), the owner or operator will be required to provide the specified records at a reasonable time, place, and manner, analogous to OSHA requirements set forth at 29 CFR 1910.1020(e)(1)(i). If the owner or operator is unable to provide the requested records within 15 working days, the owner or operator must, within those 15 days, inform the potentially exposed person or designated representative(s) requesting the record of the reason for the delay and the earliest date when the record can be made available. Additionally, in the event that a designated representative is observing exposure monitoring, the owner or operator must ensure that designated representatives are provided with PPE appropriate for the observation of monitoring. Finally, this rule requires owners or operators to provide notice to potentially exposed persons and their designated representatives of exposure monitoring results and of the availability of the exposure control plan and associated records. For purposes of this requirement, the owner or operator is only required to provide notice to those designated representatives that the owner or operator is aware of, such as representatives designated in writing or a recognized collective bargaining agent for the owner or operator's own employees.

5. Changes to WCPP Timeframes for Federal Agencies

EPA understands that certain departments and agencies of the Federal government, as well as Federal contractors acting for or on behalf of the Federal government, need additional time to comply with these timeframes. For example, complying with these timeframes could impact the ability of NASA or the Department of Defense to continue to engage in vapor degreasing necessary for rockets key to national security and critical infrastructure. While, for example, 29 CFR part 1960 sets forth procedures and guidelines for ensuring that Federal workers are protected in comparable ways to their non-Federal counterparts, EPA believes that compliance with this final rule will require increased and different preparations on the part of Federal agencies. For example, Federal agencies must follow procurement requirements, which will likely result in increased compliance timelines. In addition, those requirements will require support in the Federal budget, which, for some agencies, is a multi-year process. Therefore, EPA is providing additional time for agencies of the Federal government and their contractors, when acting for or on behalf of the Federal government, to comply with the WCPP, including 915 days for initial monitoring, 1,005 days to ensure that no

person is exposed to an airborne concentration of TCE that exceeds the interim ECEL, and 1,095 days to implement an exposure control plan.

B. Modifications to the TSCA Section 6(g) Exemptions

1. Industrial and Commercial Use of TCE as a Processing Aid in Battery Separator Manufacturing

EPA proposed a 10-year exemption from prohibition under TSCA section 6(g)(1)(B) for the industrial and commercial use of TCE as a processing aid in battery separator manufacturing, for lead acid and lithium batteries. EPA is finalizing with modifications a time-limited exemption from prohibition for this specific condition of use of TCE. These modifications, based on information provided in public comments, include: (1) narrowing the exemption to apply only to use of TCE as a processing aid in manufacturing separators for lead acid batteries; (2) extending the time period of the exemption for lead acid batteries from ten to 20 years; and (3) allowing the disposal of wastewater containing TCE following lead acid and lithium battery separator manufacture under a separate TSCA section 6(d) phase-out for disposal of TCE to industrial pre-treatment, industrial treatment, or POTWs (see Unit III.C.4.). Separate from the modified 6(g) exemption, EPA is finalizing a 5-year phase-out under TSCA section 6(d) for use of TCE in manufacturing separators for lithium batteries.

As described in the proposed rule, based on information provided by commenters and other information reasonably available to the agency, EPA understands that separators are fundamental components in batteries that provide the necessary separation between the internal anode and cathode components that make batteries work, and that restrictions on the production of battery separators could critically impact the United States battery manufacturing supply chain and impede the expansion of domestic battery production capacity. EPA understands that battery separator manufacturing processes are highly engineered, and that the separators are specialty products designed precisely to meet stringent technical specifications that are essential in powering vehicles and systems in the United States' supply chain for multiple critical infrastructure sectors.

Based on information provided in public comments regarding specifications around the final battery separator product, such as the required thickness of the separator itself and the feasibility of substitute chemicals for TCE, EPA determined that battery separators for lead acid and lithium batteries should be treated separately. Thus, EPA is distinguishing between the industrial and commercial use of TCE as a processing aid in battery separator manufacture for each type of battery (lead acid or lithium (also referred to in comments as lithium-ion batteries)) and providing different exemption or phase-out timeframes for each type of battery separator manufacturing. More details are in this Unit.

a. Lithium Battery Separator Manufacturing

EPA is finalizing a prohibition on the manufacture (including import), processing, distribution in commerce, and industrial and commercial use of TCE as a processing aid for lithium battery separator manufacturing, which will come into effect 5 years after the publication date of this rule. In response to EPA's proposal to establish a 10-year TSCA section 6(g) exemption for the use of TCE in battery separatory manufacturing, EPA received substantiative public comments that described feasible alternatives to TCE in the manufacture of lithium battery separators, as well as information on why the two types of battery separator manufacturing should be treated as distinct.

One company uses TCE in the manufacture of lithium battery separators (Ref. 46). In their public comment, the company described how they could transition out of TCE within 5 years and retracted its request for an exemption under TSCA section 6(g) for lithium battery separators (Ref. 46). EPA is unaware of any other domestic manufacturer that uses TCE to produce lithium battery separators. In public comments on a separate rulemaking for methylene chloride under TSCA section 6, at least five commenters described their plans to construct manufacturing plants for lithium-ion battery separators, specifically for electric vehicles, that would use methylene chloride as a processing aid (Refs. 59, 60, 61, 62, 63, 64), rather than TCE. (The final rule under TSCA section 6(a) to address the unreasonable risk for the use of methylene chloride as a processing aid to continue with the implementation of a WCPP (40 CFR 751.109) (89 FR 39254, May 8, 2024 (FRL–8155–01–OCSPP)).

TSCA section 6(d) requires the Agency to establish compliance deadlines that are as soon as practicable. TSCA section 6(g) requires that any exemptions be adequately justified. For the final rule, the exemption under TSCA section 6(g) applies only to lead acid battery separator manufacturing, and the Agency is prohibiting manufacture, processing, and commercial use of TCE for the manufacture of lithium battery separators after the five years specified under TSCA section 6(d). During the time before prohibition, manufacturers and processors of TCE for use in the manufacture of lithium battery separators and the users of TCE in the manufacture of lithium battery separators are required to comply with the WCPP, as described in Units III.A., and IV.C.

b. Lead Acid Battery Separator Manufacturing

EPA is finalizing a 20-year TSCA section 6(g) exemption from prohibition for the manufacture (including import), processing, distribution in commerce, and industrial and commercial use of TCE as a processing aid for lead acid battery separator manufacturing. While EPA proposed a 10-year section 6(g) exemption for the use of TCE in battery separator manufacturing, in the primary alternative regulatory action in the proposed rule EPA presented a 15-year exemption from the prohibition on TCE for the industrial and commercial use of TCE as a processing aid for battery separator manufacturing. EPA received substantiative information in follow up meetings based on public comments that 20 years would be the minimum timeframe needed to transition to an alternative for manufacturing separators for lead-acid batteries (Refs. 34, 39, 64, 65). While EPA received comments that more than 20 years may be needed, for the reasons described in this Unit, EPA is finalizing the exemption for use of TCE in manufacture of lead acid battery separators at 20 years.

EPA emphasizes that alternatives to TCE in lithium battery separator manufacturing are not expected to be feasible substitutes for TCE in lead-acid battery manufacturing due to differences in the processes for each separator type. This is primarily due to the difference in thickness of the battery separators: lithium battery separators are typically only 9 to 10 microns thick, while lead-acid battery separators range from 6 to 50 times thicker than lithium battery separators. Given the chemistry of the alternative solvent reacting with the mineral oil and metal sheets that constitute the process of manufacturing a battery separator, it would therefore require between 225 to 625 times longer to physically extract lead acid separators compared to lithium separators using an alternative solvent. TCE is about 50% to 80% (depending

on temperature) more effective at extracting process oil during the battery separator manufacturing process than the alternative product used in the manufacturer's new lithium separator process (Ref. 64). Overall, while alternatives to TCE are suitable for lithium battery separator manufacturing and may be feasibly substituted in domestic manufacturing within five years, these alternatives are not feasible for lead acid battery separator manufacturing.

Numerous commenters submitted information on the use of TCE as a processing aid in lead-acid battery manufacturing. Industry commenters and trade associations involved in battery manufacture agreed that EPA correctly categorized battery separator manufacturing as critical and essential. In public comments, battery separator manufacturers described the need for the exemption to be extended to 25 years, citing the lack of a currently identified alternative and once identified, the time necessary for testing and recertification for any alternatives to TCE. As described by commenters, the steps for such a process include: identifying and/or developing an alternative chemical as a processing aid, sample trials, battery testing, second level battery testing, changing battery separator production lines, and testing and production approval processes from battery end users (e.g., automobile manufacturers). This step-wise process is consistent with EPA's understanding of developing and implementing alternatives for other chemicals and uses. In follow-up conversations with battery separator manufactures, EPA gained further clarity that timeframes could be expedited somewhat, and on an expedited timeline would take 20 years (Ref. 64). Because TSCA section 6(g) requires that any exemptions be adequately-justified, in consideration of public input, and that the period of the exemption is reasonable, EPA is lengthening the proposed TSCA section 6(g) exemption from the prohibition for manufacture (including import), processing, distribution in commerce, and use of TCE in manufacturing separators for lead acid batteries from 10 years to 20 years (*i.e.*, to December 18, 2044.). EPA encourages manufacturers of battery separators to identify early in their substitution efforts if any further time would be needed.

2. Industrial and Commercial Use of TCE as a Processing Aid for Specialty Polymeric Microporous Sheet Materials

EPA is finalizing a 15-year TSCA section 6(g) exemption from prohibition for the manufacture (including import), processing, distribution in commerce, and industrial and commercial use of TCE as a processing aid for specialty polymeric microporous sheet materials. While EPA proposed to prohibit industrial and commercial use of TCE as a processing aid for specialty polymeric microporous sheet materials, EPA's primary alternative regulatory action described a 15-year TSCA section 6(g)(1)(A) exemption from prohibition for this use. EPA received substantiative information in public comments to support finalizing this exemption, as well as support for 15 years as the appropriate timeframe for this exemption (Ref. 40).

As noted in the initial exemption request and in the public comments submitted to EPA, specialty polymeric microporous sheet materials are fundamental components in the production of critical or essential products such as drivers' licenses, passports, and chemical drum labels (Refs. 66, 40). EPA agrees that TCE is a critical and essential component in the manufacturing process for these products. EPA also agrees that certain applications of these specialty polymeric microporous sheet materials are critical and essential uses for which no technically and economically feasible safer alternative is available. In public comments, the manufacturer of specialty polymeric microporous sheet materials disagreed with EPA's proposal to restrict the end uses of the specialty polymeric microporous sheet materials to critical and essential products, stating that all end products of the material use the same production line. EPA is finalizing with modifications a time-limited exemption from prohibition for this specific condition of use of TCE. These modifications, based on information provided in public comments, include: (1) modifying the exemption from the proposal to allow for this exempted use of TCE as a processing aid to apply broadly to any end product; (2) allowing the disposal of wastewater containing TCE associated with manufacture of specialty polymeric microporous sheet materials under a separate TSCA section 6(d) phase-out for disposal of TCE to industrial pre-treatment, industrial treatment, or POTWs (see Unit III.C.4.); and (3), in an effort to minimize worker exposure during the period of the exemption, EPA is requiring that the industrial and commercial use of TCE as a processing aid in the manufacture of specialty polymeric microporous sheet materials can only continue at existing facilities already using TCE to manufacture specialty polymeric microporous sheet materials. EPA expects that development of any new facilities for the manufacture of specialty polymeric microporous sheet materials could innovate new processes that do not include use of TCE.

3. Industrial and Commercial Use of TCE in Batch Vapor Degreasing for Essential Aerospace Parts and Components and Narrow Tubing Used in Medical Devices

EPA is finalizing the proposed primary alternative 7-year TSCA section 6(g)(1)(B) exemption from prohibition for industrial and commercial use of TCE in batch vapor degreasing for essential aerospace parts and components and 7-year TSCA section 6(g)(1)(A) exemption from prohibition for industrial and commercial use of TCE in batch vapor degreasing for narrow tubing used in medical devices. EPA received substantiative information in public comments to support the need for these exemptions. Based on the information received, EPA determined it is necessary to finalize these exemptions.

Numerous commenters urged EPA to finalize the alternative exemptions, citing strict safety and performance standards that TCE is currently used to meet and a recertification process that would take a longer timeframe than the 1 year that was proposed (Refs. 36, 43, 32, 56, 67, 43, 32, 56). Given that under this condition of use TCE is used to clean parts for highly specialized end uses in the aerospace and medical fields, commenters stressed that a significant length of time would be needed for safety recertification of an alternative. These commenters also described how all currently known potentially effective drop-in substitutes to TCE for this highly specialized use are also chemicals currently being evaluated or regulated by EPA under TSCA, and, as such, they do not view these substitutes as viable long-term alternatives to TCE. In many cases, according to commenters, the transition to a TCE substitute would require the transformation or complete replacement of complex equipment. One manufacturer indicated in their public comments that they had identified an alternative that could meet the cleanliness required for their end products; however, using this substitute chemical solvent would also require changing to a different machine type (*i.e.*, to vacuum vapor degreasers). According to that commenter, it would take seven years to install vacuum degreasers, implement the necessary infrastructure upgrades, obtain permits, notify customers, and validate existing

contracts (Ref. 36). EPA agrees that the significant amount of infrastructure and equipment changes needed to transition out of TCE for this specific vapor degreasing condition of use support finalizing a longer timeline until prohibition.

Regarding section 6(g) criteria, commenters agreed with EPA's characterization of TCE as being essential to meet unique cleanliness demands for narrow tubing used in medical devices as well as for aerospace parts. A public commenter noted the intensity of these safety concerns particularly in medical tubing, noting that in implanted devices "manufacturing residues may 'pose an inflammatory or autoimmune trigger risk' that can lead to death" (Ref. 36). For these reasons, EPA is finalizing a time-limited exemption under TSCA section 6(g)(1)(A) for seven years for the industrial and commercial use of TCE in batch vapor degreasing for narrow tubing used in medical devices, and a time-limited exemption under TSCA section 6(g)(1)(B) for seven years for the industrial and commercial use of TCE in batch vapor degreasing for essential aerospace parts.

4. Industrial and Commercial Use in Closed-Loop Batch Vapor Degreasing Necessary for Rocket Engine Cleaning by Federal Agencies and Their Contractors

EPA proposed a 7-year TSCA section 6(g)(1)(B) exemption from the prohibition on the industrial and commercial use of TCE as a solvent in closed-loop vapor degreasing necessary for human-rated rocket engine cleaning by NASA and its contractors, and the manufacture (including import), processing, and distribution in commerce of TCE for this use. EPA is finalizing with modifications the time-limited exemption from prohibition for this specific condition of use of TCE. EPA received information that this exemption should include all Federal agencies, rather than just NASA, due to Federal agencies having similar critical infrastructure and national security needs of rocket engines. Due to the commonality of the United States' rocket engine industrial base, other Federal agencies like NASA use TCE in the same condition of use to support their rocket engine cleaning. EPA has made this change and is finalizing a time-limited exemption under TSCA section 6(g)(1)(B) for industrial and commercial use of TCE as a solvent in closed-loop batch vapor degreasing necessary for rocket engine cleaning by Federal agencies and their contractors.

C. Changes to Compliance Dates for Prohibitions Under TSCA Section 6(d)

EPA proposed a compliance timeframe of 1 year for the prohibitions on industrial and commercial use of TCE and requested public comments on the appropriateness of this timeline for specific conditions of use. This unit describes modifications EPA made to proposed timeframes for prohibitions under TSCA section 6(d) for the two conditions of use for which EPA is finalizing different timeframes for prohibition. (Changes to timeframes for proposed TSCA section 6(g) exemptions or modifications of a section 6(g) exemption to a section 6(d) timeframe are described in Unit III.B.). Given that the part of the rule affecting the most significant volume of TCE is unchanged between proposal and final, the overall impact of these changes is expected to be minor.

1. Industrial and Commercial Use of TCE in Energized Electrical Cleaner

As described in this Unit, EPA is finalizing a prohibition in three years for the industrial and commercial use of TCE in energized electrical cleaner rather than the prohibition within 1 year as proposed for this condition of use. EPA notes that energized electrical cleaner is a sub-use of the industrial and commercial use of TCE as solvent for aerosol spray degreaser/cleaner. During the timeframe before prohibition, EPA is finalizing requirements to comply with *either* specific prescriptive controls *or* the WCPP for the industrial and commercial use of TCE in energized electrical cleaner, which is a sub-use of the industrial and commercial use of TCE as solvent for aerosol spray degreaser/cleaner, as described in Unit IV.D.1.

In the proposed rule, EPA solicited comment on whether some activities would need longer compliance timeframes in order to appropriately transition, and specifically mentioned uses such as energized electrical cleaning, where TCE may be desired due to its low flammability. EPA also requested comment on the feasibility and appropriateness of the WCPP. EPA subsequently received several comments expressing concern over the proposed prohibition on TCE in energized electrical cleaner (Refs. 51, 68). In addition to describing the need for additional time to transition to alternatives to TCE in energized electrical cleaner, commenters described the work practices and context that support the potential for exposure reduction to TCE through workplace controls, including, but not limited to, the WCPP. For example, one commenter described how energized electrical cleaners are typically used only by professionals for specialized uses in which strict workplace controls already exist (Ref. 51). As another example, in a separate rulemaking under TSCA section 6 for PCE (RIN 2070–AK84), one commenter described work practices and controls for use of energized electrical cleaners, stating that facilities that require cleaning of energized equipment rely on skilled technicians or other professional users who typically have education and training that may include two years at lineman school, time as an apprentice, licensing or certifications, and continuing education (Ref. 69). The commenter also stated that OSHA General Industry and Construction standards include requirements specific to electrical work under 29 CFR part 1926, subparts E, K, and V. Commenters differed on whether the WCPP or other workplace controls would be most suitable. Several commenters stated that the WCPP would be impractical for use of TCE in energized electrical cleaner because trained technicians often travel to different facilities to conduct work, including facilities that may not otherwise use a chemical for which the WCPP is required, and suggested that instead of a WCPP, a training and certification program would be sufficient to address the unreasonable risk (Refs. 51, 68).

Based on the information submitted to EPA as part of the comment period regarding this condition of use, supported by subsequent discussions for clarification, and in consideration of existing best practices and regulations for work in electrical spaces as well as the need for additional time to certify and transition to substitutes, EPA is finalizing a prohibition on the use of TCE in energized electrical cleaner after December 18, 2027. In addition, EPA has determined that either the WCPP or specific prescriptive controls specified in the final rule, including dermal PPE and respiratory protection, are necessary and appropriate for reducing exposures to potentially exposed persons until the prohibition takes effect.

EPA notes the importance of existing OSHA regulations designed to protect workers exposed to dangers such as electric shock, electrocution, fires, and explosions. Specifically, in addition to the requirements for electrical work under OSHA General Industry and Construction standards at 29 CFR part 1926, subparts E, K, and V that one commenter mentioned in their public comment, OSHA regulates electrical work under Occupational Safety and

Health standards at 29 CFR part 1910. For example, OSHA requires safety-related work practices on electrical equipment under the Electrical Standard at 29 CFR part 1910, subpart S (29 CFR 1910.301 to 1910.399), which was significantly updated in 2007 (72 FR 7136, February 14, 2007). OSHA also sets forth requirements for the operation and maintenance of electrical power generation, control, transformation, transmission, and distribution lines and equipment under the Electric Power Generation, Transmission, and Distribution standard at 29 CFR 1910.269, which was significantly updated in 2014 (79 FR 20316, April 11, 2014). Additionally, OSHA regulates electrical protective equipment under the Electrical Protective Equipment standard at 29 CFR part 1910, subpart I (29 CFR 1910.137), which was significantly updated in 2014 (79 FR 20316, April 11, 2014). Other standards and best practices apply to electrical safety in the workplace, for example the National Fire Protection Association (NFPA) 70E Standard for Electrical Safety in the Workplace (Ref. 70).

As discussed in the proposed rule, given the risk profile of TCE, EPA determined that it is necessary to require worker protection measures such as the WCPP for those conditions of use that will continue beyond 1 year. In view of the relatively short timeframe for transitioning to an alternative, combined with the specialized nature of this use of TCE and the existing OSHA regulations and other best practices for performing work on energized equipment, EPA recognizes that the WCPP may not be the best approach to addressing occupational exposures in the interim. EPA understands that trained technicians performing this activity often travel to different facilities to conduct their work, including facilities that may not otherwise use TCE. EPA also determined that owners and operators who perform this kind of work should focus their efforts on transitioning to alternatives, rather than setting up comprehensive exposure control plans and programs. EPA is therefore providing an alternative to the WCPP in the form of prescriptive controls, including respiratory and dermal protection to protect workers in the interim. Considering all of these factors, as well as the workplace requirements for energized electrical cleaner in the final regulation of PCE under TSCA section 6 (RIN 2070–AK84) and the burdens associated with higher APF respirators, EPA has determined that the use of respirators with an APF of 50 or greater and impermeable gloves will minimize the exposure to the potentially exposed persons engaged in this use of TCE during the interim period before the prohibition takes effect, as further described in Unit IV.D. In addition, requiring PPE similar to that required by the PCE regulation is expected to ease the transition to PCE, which is a possible replacement for TCE in these products. The upstream manufacturing and processing of TCE for the use in energized electrical cleaner will be subject to the WCPP as described in Unit IV.C. until the use is prohibited.

EPA emphasizes that other industrial and commercial use of TCE as a solvent for aerosol spray degreasers/cleaners is prohibited in the final rule, consistent with the proposal for that condition of use.

2. Industrial and Commercial Use in Adhesives and Sealants for Aerospace Applications

EPA is finalizing a prohibition in five years for the industrial and commercial use of TCE in adhesives and sealants for aerospace applications. EPA proposed a compliance timeframe of 1 year for the prohibitions on industrial and commercial use, and in public comments requested feedback on the appropriateness of this timeline for specific applications. EPA received public comments highlighting that the industrial and commercial use of TCE in adhesives and sealants specifically for aerospace applications has safety implications and involves longer recertification timelines (Ref. 56). EPA's rationale for the short timeframe until prohibition for this condition of use was based on the understanding that alternative formulations or products exist that do not contain TCE. During the public comment period, EPA received public comments highlighting the safety considerations for industrial and commercial use of TCE in adhesives and sealants specifically for aerospace applications and longer recertification timelines. A public commenter stated that TCE is still critically necessary in adhesives and sealants; particularly in aircraft pneumatic deicing boots; in solvent bonding of plastic components, including on Oxygen Container Assemblies for Passenger Service Unit products used in aircraft; and as an adhesive or sealant for flight-critical equipment on new and existing aircraft, both commercial and military (Ref. 56). Regarding compliance timeframes, this commenter requested that adhesives and sealants for aerospace be allowed to continue in perpetuity under a WCPP. EPA has determined that prohibition of this use is necessary to address the unreasonable risk. EPA did consider the information raised by this commenter in determining an appropriate timeframe for the prohibition on use of TCE in adhesives and sealants for aerospace applications. Specifically, the commenter provided information that for uses in the aerospace and defense sector, changes in response to a prohibition on TCE would be a multiyear process that requires redesign and recertification that a product meets performance standards such as customers' technical requirements, UL and Conformité Européenne (CE) marking requirements, military specifications, and specifications from other government agencies such as the Federal Aviation Administration and NASA (Ref. 56).

EPA recognizes that the recertification process for uses in aerospace applications is lengthy and agrees that one year is not a sufficient timeframe. In identifying a reasonable timeframe, EPA considered public comments on the proposed rulemaking and follow-up clarifying conversations with commenters, as well as information submitted during the public comment period on EPA's proposed rule under TSCA section 6 for methylene chloride (88 FR 28284, May 3, 2023 (FRL–8155–02–OCSPP)) regarding anticipated timeframes to recertify adhesives and sealants used in the aerospace field. As such, EPA has determined that a 5-year timeframe until prohibition for the industrial and commercial use of TCE in adhesives and sealants for aerospace applications is appropriate and will be sufficient to allow for a reasonable transition from TCE. During this time, EPA is requiring compliance with the WCPP, as detailed in Unit IV.C. The issuance of this final rule does not preclude these users from presenting additional information to EPA on their redesign and recertification progress in the future.

3. Industrial and Commercial Use of TCE in Laboratory Use for Asphalt Testing and Recovery

EPA is finalizing a phase-out of ten years for the industrial and commercial use of TCE in laboratory use for asphalt testing and recovery, with a prohibition on use of TCE in manual centrifuge processes at 5 years. In the proposed rule, EPA proposed to prohibit the laboratory use of TCE (which falls within the condition of use "Industrial and commercial use of TCE in hoof polish; gun scrubber; pepper spray; and other miscellaneous industrial and commercial uses") within 1 year. EPA proposed a TSCA section 6(g)(1)(A) exemption from prohibition for the

industrial and commercial use of TCE in laboratory use for essential laboratory activities that are critical (*e.g.*, occupational sampling and monitoring, the support of environmental cleanup activities, wax removal from NASA infrared sensors, and equipment calibration related to the search for chlorinated hydrocarbons on Mars; for a full list of critical activities see Unit V.A.3.a.iii. of the 2023 TCE proposed rule). In the 2023 TCE proposed rule, EPA specifically noted that the use of TCE in laboratory settings for testing asphalt would not be included in the TSCA section 6(g) exemption due to information available to EPA that indicated it was not critical nor essential, and because alternative testing methods exist, including the Nuclear Asphalt Content Gauge and the Ignition Method.

During the public comment period, EPA received numerous comments providing new information on the importance of TCE in asphalt testing and recovery as a laboratory use, and the challenges of using a substitute that had appeared theoretically feasible. Many commenters, including several state departments of transportation, emphasized to EPA that 23 state specifications require TCE to be used for solvent extraction for asphalt testing accuracy (Refs. 55, 57, 58, 71, 72, 73, 74, 75, 76, 77). Commenters described how this use of TCE is critical or essential; specifically, numerous commenters emphasized that in the current landscape for asphalt testing and recycling, TCE is widely used at this time because it can be easily recovered and the asphalt test sample can then be reused rather than discarded. Further, as commenters described, using TCE in laboratory testing allows departments of transportation to recycle asphalt paving and shingles into new asphalt by determining how much asphalt binder is present. The ability to determine the amount of remaining asphalt binder has resulted in, according to commenters, asphalt being one of the most recycled materials. The Nuclear Asphalt Content Gauge that EPA had identified as an alternative in the proposed rule does not allow for asphalt recycling, as it destroys the asphalt sample during the test which makes it impossible to test the asphalt binder as well.

In consideration of public comments, EPA has determined that a prohibition after 1 year is not reasonable. States are currently invested heavily in extraction equipment that uses TCE and EPA agrees with commenters who stated that transitioning from TCE would take years and incur significant costs as a result of equipment changes. Commenters expressed an interest in ceasing their use of TCE and requested between 5 years and 20 years until prohibition of this use of TCE in order to facilitate a transition away from TCE. In determining a reasonable timeframe for a phase-out, EPA considered significant information provided in public comments about the potential alternatives to TCE in laboratory asphalt testing that would allow for testing as well as recovery. While alternatives have already been identified, fully implementing use of those substitutes would require the complete retrofit of existing laboratory equipment. Additionally, numerous state departments of transportation standards would need to be updated, which would take time.

EPA does not view the 50-year timeframe proposed (and finalized) for the exemption for laboratory use of TCE for essential laboratory uses as appropriate for use of TCE in asphalt testing and recovery, so is not finalizing the laboratory asphalt testing and recovery use as part of the TSCA section 6(g) exemption for essential laboratory activities. Based on public comments and discussions with the U.S. Department of Transportation, EPA has determined that 10 years is a reasonable timeframe until the prohibition on TCE use in laboratory use for asphalt testing and recovery and is finalizing an extended phase-out of ten years for the industrial and commercial use of TCE in laboratory use for asphalt testing and recovery. Associated with this phase-out, EPA will require the establishment of the TCE WCPP, outlined in Unit IV.C. within 180 days after publication of the final rule, as workplace protections during the period of the phase-out. Additionally, EPA has identified asphalt testing and recovery conducted through manual centrifuge methods as specific activities that would be prohibited within five years as part of the phase-out, due to the higher level of worker exposure from this activity and information received from commenters about automated alternatives.

In public comments, numerous users of TCE for asphalt testing and recovery provided information to EPA regarding technological advances in this sector—namely the transition from manual centrifuge methods of testing to automated machines (Refs. 71, 72, 57). Many laboratories have invested in automated extraction machines. These machines are expensive and currently are calibrated to be chemical-specific, with TCE-calibrated machines unable to use a different or replacement solvent, such as PCE (Refs. 71, 72, 55). EPA's identification of a 10-year timeframe for prohibition is partly based on the time it would take to replace or retrofit the current laboratory practices with non-TCE automatic extraction machines.

Based on public comments, EPA understands that the industry favors automated extraction machines due to the extremely high worker exposures inherent with manual centrifuge processes. Commenters describe manual centrifuge processes as resulting in worker exposure to TCE for the entire task duration, with constant handling of the solvent by stirring, repouring, straining, and vaporizing it at times (Ref. 71). EPA agrees with commenters on the high risk of asphalt testing and recovery using TCE in manual methods. As such, as part of the phase-out, any lab use of TCE for asphalt testing or recovery which uses manual centrifuge processes is prohibited in 5 years. Between 5 and 10 years, labs must either use TCE in automated machines only, or use alternative solvents in automated machines or manual centrifuge processes (such as methylene chloride or PCE, for which EPA has finalized provisions requiring chemical specific WCPPs). Therefore, EPA is finalizing an extended phase-out of ten years for the industrial and commercial use of TCE in laboratory use for asphalt testing and recovery, with a prohibition on use of TCE in manual centrifuge processes at 5 years, rather than the prohibition within 1 year as proposed for all other industrial and commercial uses without extended phase-outs or exemptions.

4. Disposal of TCE to Industrial Pre-Treatment, Industrial Treatment, and POTWs

For disposal of TCE to industrial pre-treatment, industrial treatment, and POTWs, EPA is finalizing a phase-out over 20 years. In the proposed rule, EPA proposed to prohibit the disposal of TCE to industrial pre-treatment, industrial treatment, and POTWs in 1 year after the rule finalization. In the proposal, EPA requested comment on whether the prohibition timeframes and compliance dates were appropriate. In public comments, EPA received substantive information from several industrial and commercial users of TCE as a processing aid that wastewater disposal should continue on a timeframe to facilitate those uses.

Commenters manufacturing battery separators provided details on why the industrial and commercial use of TCE in battery separator manufacturing necessitates the disposal of wastewater containing TCE (Refs. 46, 34). As described by commenters, in battery separator manufacturing, TCE enters the

wastewater stream following contact between cooling tower blowdown, processes involving TCE, and water generated from the plant's steam distillation process, which is a key process step in battery separator manufacture. Water used in these processes becomes wastewater containing TCE. These manufacturers perform on-site treatment of this wastewater through air stripping and carbon absorption. The pre-treated water is then either recycled and reused in the process or discharged to a POTW. Wastewater discharges by battery separator manufacturers are regulated under existing wastewater discharge permits and have limits for volatile organic compounds such as TCE. EPA agrees with commenters assertions that TCE wastewater is inherently leftover as part of the process and agrees that no other form of disposal is acceptable. Given that the generation of wastewater containing TCE cannot be avoided as it results from an intrinsic component of battery separator manufacture, and EPA's determination that use of TCE in battery separator manufacture is either a critical and essential function for which there is no technically or economically feasible safer alternative (in the case of lead acid batteries) or for which five years before prohibition is as soon as practicable (in the case of lithium batteries), EPA is modifying the associated timelines for the prohibition on disposal for these uses, with worker protections, to continue disposal of wastewater containing TCE that is a necessary part of this process.

Based on public comments, EPA also finds that disposal of wastewater is a necessary part of the use of TCE as a processing aid in the manufacture of specialty polymeric microporous sheet materials. Like the battery separator manufacturers, comments submitted from the specialty polymeric microporous sheet materials manufacturer explained that TCE enters the facility wastewater that is generated in cooling tower blowdown water and subsequently discharged to a POTW (Ref. 40). Wastewater discharges are regulated under existing wastewater discharge permits and have limits for volatile organic compounds such as TCE. Given the determination of the critical and essential need for the longer timeframes for this industrial and commercial use, EPA is modifying the TSCA section 6(d) phaseout for disposal of TCE for this use to allow disposal of wastewater containing TCE that is a necessary part of this process.

As such, the disposal of TCE to industrial pre-treatment, industrial treatment, and POTWs is prohibited with the following phase-out structure. For the majority of industrial and commercial uses, such disposal is prohibited at one year. For industrial and commercial users of TCE as a processing aid in lithium battery separator manufacturing, such disposal is prohibited at 5 years. For industrial and commercial users of TCE as a processing aid in specialty polymeric microporous sheet materials manufacturing, such disposal is prohibited after 15 years. For industrial and commercial users of TCE as a processing aid in lead-acid battery separator manufacturing, such disposal is prohibited after 20 years. Industrial and commercial users who are allowed to continue disposing of TCE to wastewater for more than one year must follow the WCPP provisions as laid out in Unit IV.C, and POTWs receiving wastewater must follow the wastewater worker protection provisions discussed in Unit IV.E.3.

5. Industrial and Commercial Use of TCE for Batch Vapor Degreasing for Land-Based DoD Defense Systems by Federal Agencies and Their Contractors

EPA is finalizing a prohibition in five years for the industrial and commercial use of TCE in batch vapor degreasing for land-based DoD defense systems by Federal agencies and their contractors. EPA proposed a compliance timeframe of one year for the prohibitions on industrial and commercial use of TCE in vapor degreasing. EPA received information indicating that this use needs to continue for a longer period of time due to the national security implications of the end products, and the need for a reasonable transition period for that use that is as soon as practicable but longer than the one year proposed. TCE vapor degreasing is necessary due to technical challenges with other substitute chemicals or alternative methods. The cleanliness standards of certain parts as required by DOD specifications or other specifications included in existing contracts within the supply chain currently require TCE. A reasonable transition period for this technically challenging use requires substantial investment and time to develop viable alternatives, because conversion from vapor degreasing to other methods of cleaning is a capital-intensive investment that would require several years to plan, permit, construct, and install. TCE has been used in vapor degreasing to meet required levels of cleanliness of certain supplied parts by long-standing design specifications that are incorporated into contracts of a complex supply chain. As such, the industrial and commercial use of TCE for batch vapor degreasing for land-based DoD defense systems is prohibited after 5 years, rather than at 1 year with vapor degreasing for other purposes.

D. Other Changes

1. Regulatory Threshold

In the 2023 TCE proposed rule, EPA requested comment on whether the Agency should consider a de minimis threshold of TCE in formulations when finalizing prohibitions, and, if so, what threshold should be considered. EPA received comments in support of the inclusion of a de minimis threshold, as well as comments opposing such a threshold. Of the supportive commenters, many agreed with the EPA request for comment on using 0.1% by weight as the threshold for the applicability of prohibitions and restrictions on TCE (Refs. 53, 78, 51), which EPA is referring to in this final rule as a regulatory threshold. Commenters provided a variety of reasons in support of a regulatory threshold, such as the difficulty of proving the absence of a chemical (Refs. 38, 79) and the importance of providing for very small amounts of a chemical that cannot be reasonably eliminated (Ref. 37). Commenters observed that TCE is unintentionally manufactured as a byproduct in small amounts in the manufacture of chlorinated organics and noted that this cannot be prevented in the production process (Ref. 39). In some cases, commenters noted that a 0.1% threshold would be consistent with the requirements under the OSHA Hazard Communication Standard at 29 CFR 1910.1200 (Refs. 78, 51). One of these commenters observed that, because levels below 0.1% are not required to be reported on Safety Data Sheets (SDSs) under the OSHA Standard, there is likely to be a lack of awareness of products that contain TCE below this level.

To aid the regulated community with implementing the prohibitions on TCE and to account for TCE as a byproduct or impurity in products, EPA is establishing a regulatory threshold of 0.1% for TCE, indicating that TCE at concentrations less than 0.1% by weight are not subject to the prohibitions and restrictions outlined in this rulemaking. EPA views the regulatory threshold as an appropriate policy approach necessary to aid in the rule implementation and to clarify which products are subject to the final rule. As defined in 40 CFR 751.5, "product" means "the chemical substance, a mixture containing the chemical

substance, or any object that contains the chemical substance or mixture containing the chemical substance that is not an article."

This 0.1% regulatory threshold for TCE is in alignment with Appendix A of 29 CFR 1910.1200 Health Hazard Criteria developed by OSHA; OSHA described this threshold in the 2012 modifications to the hazard communication standard: "When data on the mixture as a whole are not available, the mixture is considered to present the same health hazards as any ingredients present at a concentration of 1% or greater, or, in the case of carcinogens, concentrations of 0.1% or greater. The current HCS [hazard communication standard] also recognizes that risk may remain at concentrations below these cut-offs, and where there is evidence that that is the case, the mixtures are considered hazardous under the standard." (89 FR 44144, May 20, 2024). Under 29 CFR 1910.1200, a health hazard is defined as "a chemical which is classified as posing one of the following hazardous effects: acute toxicity (any route of exposure); skin corrosion or irritation; serious eye damage or eye irritation; respiratory or skin sensitization; germ cell mutagenicity; carcinogenicity; reproductive toxicity; specific target organ toxicity (single or repeated exposure); or aspiration hazard." The criteria for determining whether a chemical is classified as a health hazard are detailed in Appendix A to 29 CFR 1910.1200—Health Hazard Criteria. Appendix A.6.3.1 and A.7.3.1.1 of 29 CFR 1910.1200 indicate that a mixture must be classified as a carcinogen or a reproductive toxicant, respectively, if it includes greater than or equal to 0.1% of a substance that, like TCE, is classified as a carcinogen or a reproductive toxicant. Other EPA programs, such as the Toxics Release Inventory (TRI) program, have adopted the OSHA threshold of 0.1% for chemicals which are defined as carcinogens or as a potential carcinogen under the National Toxicology Program, International Agency for Research on Cancer, or OSHA (see 40 CFR 372.38(a)).

EPA is finalizing a regulatory threshold of 0.1% so that products containing TCE at concentrations less than 0.1% by weight are not subject to the prohibitions and restrictions of this final rule. EPA is finalizing this threshold for many of the reasons stated by commenters, such as the difficulty of proving the absence of a chemical (and the resulting uncertainty in various supply chains), the fact that the manufacture of chlorinated organics results in the unintentional manufacture of small amounts of TCE (and other chlorinated compounds) as a byproduct that becomes an impurity that is not feasible to remove, and the fact that it would be consistent with the OSHA Hazard Communication Standard and other programs to which industry has already calibrated its processes. EPA believes that adopting a regulatory threshold of 0.1% for TCE, which is a carcinogen and a reproductive toxicant, will increase regulatory certainty and ease implementation of the eventual prohibition of this chemical. This regulatory threshold is well below the concentration used for any products that contributed to the unreasonable risk. By prohibiting TCE concentrations of 0.1% or greater in products, EPA prevents any functional uses of TCE, which generally rely on a higher concentration of the chemical in order to make use of TCE's chemical properties. The manufacture (including import), processing, and distribution in commerce of products that contain TCE at concentrations equal to or above the regulatory threshold of 0.1% are still subject to the prohibitions and restrictions of this final rule, regardless of the concentration of TCE in the end product.

2. Processing of TCE Manufactured as a Byproduct

In the 2023 TCE proposed rule, EPA noted that TCE that is manufactured as a byproduct (such as during the manufacture of other chemicals, *e.g.*, 1,2-dichloroethane (1,2–DCA)) is not considered to be within the condition of use of TCE manufacturing. EPA has not changed this determination. However, in the 2023 TCE proposed rule, EPA did consider processing (including reuse) of TCE that was manufactured as a byproduct to be under the processing as a reactant/intermediate condition of use of TCE. Specifically, in Unit III.B.1.b.i. of the 2023 TCE proposed rule ("processing as a reactant/intermediate"), EPA noted that "this condition of use includes reuse of byproduct or residual TCE as a reactant." EPA received numerous public comments on how the proposed rule addressed TCE as a byproduct that was then processed, with several commenters providing detailed information on how TCE is unintentionally manufactured as a byproduct during complex chemical processing streams and then processed and re-processed within those streams alongside other, similar chemicals (Refs. 42, 80, 39, 81, and 56). For clarity, EPA is using the terms reuse, recycling, and re-processing within this section as specifically used by commenters to refer to actions that occur under the larger condition of use of "processing." One commenter pointed out that without excluding from the prohibitions any subsequent processing of TCE manufactured as a byproduct, chemical facilities would experience significant disruptions when trying to isolate and remove the TCE that was unintentionally manufactured, and that would otherwise be processed and consumed (Ref. 43). This commenter also emphasized the anticipated negative waste and upstream production impacts from a prohibition on the reuse of TCE manufactured as a byproduct, and highlighted how TCE is produced in the 1,2–DCA manufacturing process and how it is processed and recycled in the reactor manufacturing process for PCE and carbon tetrachloride (CTC). This commenter highlighted that if TCE byproduct processing was prohibited, this would significantly increase the quantity of hazardous waste disposed of and increase the use of virgin raw material in chemical manufacturing (Ref. 43). The commenter also provided a description of controls in place at chlorinated organic facilities to mitigate risk associated with TCE byproduct creation and recycling as well as citations to communications with EPA regarding these processes (Ref. 43).

As described in more detail in the Response to Comments document (Ref. 11), EPA agrees with commenters that TCE manufactured as a byproduct should logically be able to be processed, including recycled, during or concurrent with the processing of the intended manufactured chemical substance(s) so long as the TCE is processed in a site-limited, physically enclosed system within the same reaction process. EPA also recognizes the significant risks to workplace safety if all facilities manufacturing TCE as a byproduct had to distill, remove, and destroy all traces of TCE before further chemical processing could commence. For this reason, EPA is excluding from this rule the processing of TCE as a byproduct when that byproduct TCE is processed within a site-limited, physically enclosed system that is part of the same overall manufacturing process from which the byproduct substance was generated. In this rule, EPA is incorporating the definition of "site-limited" in 40 CFR 711.3 and also aligning with the description of site-limited, physically enclosed systems in 40 CFR 711.10(d)(1), which identifies activities for which reporting on certain byproducts is not required under the CDR Rule.

In proposing the CDR definition, EPA described enclosed systems for the purposes of CDR as system of

equipment directly connected to the production process that is designed, constructed, and operated in a manner which prevents emissions, or the release of any chemical substance into the facility or environment during the production process. (84 FR 17692, April 25, 2019) (FRL–9982–16). Such emissions, including fugitive emissions, could lead to exposures to workers, the public, or the environment. For an enclosed system, exposure and release could only occur due to loss of integrity or failure of the manufacturing process equipment or control systems. To meet the EPA enclosed system scenario, any equipment that the byproduct is present in at any point during the process sequence, such as tanks, reaction vessels, reactors, processing units (*e.g.*, a drum filter), and/or connecting lines, must: (1) Be of high structural integrity and contained on all sides, (2) pose no foreseeable potential for escape of constituents to the facility or environment during normal use, and (3) be connected directly by pipeline or similarly enclosed device to a production process. Also, any transfers or holding steps occurring in this system must be necessary to the recycle process and must take place within physically enclosed equipment that meet the enclosed system scenario. For example, hard piping or completely sealed (*i.e.*, welded) equipment would meet these criteria if connected directly to other enclosed equipment, preventing potential releases including fugitive emissions.

EPA is finalizing an exclusion from this rule for TCE manufactured and then processed as a byproduct in a site-limited, physically enclosed system that is part of the same overall manufacturing process from which the byproduct TCE was generated. EPA plans to interpret the exclusion for processing byproduct TCE in this rule in a similar way as the exemption for certain byproducts from CDR.

EPA recognizes the concerns that other commenters raised regarding potential risks from TCE manufactured as a byproduct; several commenters stated that rather than expand exclusions for TCE manufactured as a byproduct, EPA should evaluate all aspects of manufacture of a chemical substance and that byproducts could pose a risk to fenceline communities (Refs. 44, 30). As described in the proposed rule, EPA is including the evaluation of TCE manufactured as a byproduct during the manufacture of 1,2–DCA in the risk evaluation for 1,2–DCA. Additionally, unless it is for the purposes of disposal (see Unit IV.C.1.d.), TCE that exits the site-limited, physically enclosed systems in which it was manufactured by removal from the system, by relocation, or by conclusion of the manufacturing process is subject to the restrictions, prohibitions, and other provisions of this final rule. EPA notes that for the manufacturing of two chemicals, PCE and CTC, which may produce TCE as a byproduct within site-limited, physically enclosed systems, EPA is requiring a WCPP for PCE or CTC, which would provide a level of protection from TCE for potentially exposed persons while addressing the unreasonable risk from PCE or CTC.

EPA received additional information from a chemical manufacturer (Ref. 82) that manufactures TCE as a byproduct during other processes and then sends the TCE offsite for RCRA hazardous waste disposal. EPA notes that in the Risk Evaluation for TCE, EPA explained that it had tailored the scope of the risk evaluation to exclude the disposal pathway of TCE, except for limited disposal of TCE-containing wastewater discussed in Unit IV.B.6. Thus, the disposal of TCE and the processing and distribution in commerce for such disposal is out of scope for this rule unless otherwise specified. EPA understands that some facilities, such as those that produce substances critical to the battery supply chain, may manufacture TCE as a byproduct and that TCE is not further processed onsite but rather is disposed of offsite. Such activity is not covered by this rule.

3. Industrial and Commercial Use of TCE as a Solvent for Closed-Loop Batch Vapor Degreasing for Rayon Fabric Scouring for Rocket Booster Nozzle Production for Federal Agencies and Their Contractors

In the 2023 TCE proposed rule, EPA included several longer timeframes for TCE uses specifically to foster and support Federal Agencies' missions related to national security and critical infrastructure. EPA received public comment on one of these conditions of use and provisions that relate to compliance. The comment relates to the phase-out of TCE in industrial and commercial use as a solvent for closed-loop batch vapor degreasing for rayon fabric scouring for rocket booster nozzle production. EPA proposed that within 5 years of the publication date of the final rule the Federal agency that is the end user of the rayon fabric for rocket booster nozzle production (*e.g.*, the U.S. Department of Defense (DOD) or NASA) would need to conduct a final pre-launch test of rocket boosters without using TCE. By 10 years from the publication date of the final rule, the phase-out would be complete and industrial and commercial use of TCE as a solvent for closed-loop batch vapor degreasing would be prohibited. A commenter brought to EPA's attention that although EPA proposed to require the testing of an alternative process, the proposed regulation did not include a requirement to switch to an alternative once a suitable one was fully validated (Ref. 44). As the commenter noted, such a requirement is necessary to prompt users to discover and implement effective and safer alternatives to TCE. EPA agrees, as the intention of this phase-out and the 5-year testing requirement is to incentivize TCE users to transition away as fast as practicable. Based on this public comment, EPA has modified the regulatory text to require use of the tested alternative if it proves to be an adequate substitute.

4. Definitions

EPA proposed to add definitions for "Authorized person," "ECEL," "Exposure group," "Owner or operator," "Potentially exposed person," "Regulated area," and "Retailer" to 40 CFR part 751, subpart A. The final rule under TSCA section 6 to address the unreasonable risk presented by methylene chloride (89 FR 39254, May 8, 2024 (FRL–8155–01–OCSPP)) added the definitions for "Authorized person," "Owner or operator," "Potentially exposed person," "Regulated area," and "Retailer" to subpart A. The final rule under TSCA section 6 to address the unreasonable risk presented by PCE (RIN 2070–AK84) added the definition for "Exposure group" and "ECEL" to subpart A.

In this final rule, EPA is adding a definition for "interim ECEL" to subpart D to incorporate the interim ECEL value discussed in Unit III.A.1. and to make it clear that the interim ECEL is only applicable during the phaseout and TSCA section 6(g) exemption periods. EPA has also revised the proposed subpart D definition of "ECEL action level" to refer to an "interim ECEL action level" and to incorporate the interim ECEL action level value described in Unit III.A.1.

Lastly, to provide additional clarity, EPA has revised its proposed descriptions in the preamble of industrial and commercial use of TCE as solvent for open-top or closed-loop batch vapor degreasing for essential aerospace parts and for narrow tubing for medical devices. The revised descriptions appear in Unit IV.B.1.

IV. Provisions of the Final Rule

EPA intends that each provision of this rulemaking be severable. In the event of litigation staying, remanding, or invalidating EPA's risk management approach for one or more conditions of use in this rule, EPA intends to preserve the risk management approaches in the rule for all other conditions of use to the fullest extent possible. The Agency evaluated the risk management options in TSCA section 6(a)(1) through (7) for each condition of use and generally EPA's regulation of one condition of use to address its contribution to the unreasonable risk from TCE functions independently from EPA's regulation of other conditions of use, which may have different characteristics leading to EPA's risk management decisions. Further, the Agency crafted this rule so that different risk management approaches are reflected in different provisions or elements of the rule that are capable of operating independently. Accordingly, the Agency has organized the rule so that if any provision or element of this rule is determined by judicial review or operation of law to be invalid, that partial invalidation will not render the remainder of this rule invalid.

There are many permutations of this. For example, as discussed in Unit IV.B., this final rule prohibits industrial and commercial use of adhesives and sealants that contain TCE (with subsets of this use with a delayed compliance date as described in Unit IV.B.2. or an exemption as described in Unit IV.G.). This final rule also prohibits all consumer uses of TCE as discussed in Unit IV.B.1. To the extent that a court were to find that EPA lacked substantial evidence to support its prohibition of adhesives and sealants or otherwise found legal issues with EPA's approach to that condition of use, it would have no bearing on other similarly situated conditions of use, such as those involving consumer use of TCE, unless the specific issue also applies to the particular facts associated with consumer use. This is reflected in the structure of the rule, which describes the specific prohibitions separately by compliance date. EPA also intends all TSCA section 6(a) risk management elements in this rule to be severable from each TSCA section 6(g) exemption. EPA has the authority to promulgate TSCA section 6(g) exemptions "as part of a rule promulgated under [TSCA section 6(a)]." However, EPA's risk management decisions under TSCA sections 6(a) and 6(c) are independent from EPA's consideration of whether it is appropriate, based on the factors in TSCA section 6(g), to exempt specific conditions of use from the requirements of the TSCA section 6(a) risk management elements in the rule. In other words, EPA first decides whether and how to regulate each condition of use, per TSCA sections 6(a) through (c), and only then determines whether an exemption under TSCA section 6(g) is appropriate. Accordingly, the underlying TSCA section 6(a) risk management elements would not be impacted if a TSCA section 6(g) exemption is determined by judicial review or operation of law to be invalid. Rather, the exempted condition of use would become subject to the underlying TSCA section 6(a) risk management element(s).

EPA also notes that there are multiple avenues to ask EPA to revisit issues in this TSCA section 6(a) rulemaking, both before and after the mandatory compliance dates are set consistent with TSCA section 6(d). EPA has the authority under TSCA section 6(g) to consider whether an exemption is appropriate and, consistent with TSCA section 6(g)(1), may propose such exemptions independently from this rulemaking. Additionally, any person could petition EPA to request that EPA issue or amend a rule under TSCA section 6.

A. Applicability

This final rule sets prohibitions and restrictions on the manufacture (including import), processing, distribution in commerce, commercial use, and disposal of TCE to prevent unreasonable risk of injury to health in accordance with TSCA section 6(a), 15 U.S.C. 2605(a). Additionally, pursuant to TSCA section 12(a)(2), this rule applies to TCE even if being manufactured, processed, or distributed in commerce solely for export from the United States because EPA has determined that TCE presents an unreasonable risk to health within the United States.

As discussed in Unit III.D., EPA's final rule is adopting a regulatory threshold of 0.1% of TCE (in the 2023 proposed rule, this was referred to as a de minimis threshold). In other words, the provisions of this rulemaking only apply when TCE is present in a product at 0.1% or greater by weight. Additionally, the provisions of this final rule only apply to chemical substances as defined under TSCA section 3. Notably, TSCA Section 3(2) excludes from the definition of chemical substance "any food, food additive, drug, cosmetic, or device (as such terms are defined in Section 201 of the Federal Food, Drug, and Cosmetic Act [21 U.S.C. 321]) when manufactured, processed, or distributed in commerce for use as a food, food additive, drug, cosmetic, or device" and "any pesticide (as defined in the Federal Insecticide, Fungicide, and Rodenticide Act [7 U.S.C. 136 *et seq.*]) when manufactured, processed, or distributed in commerce for use as a pesticide." Additional details regarding TSCA statutory authorities can be found in section 2 of the Response to Comments document (Ref. 11).

As discussed in Unit III.D. of this final rule, TCE that is manufactured as a byproduct (such as during the manufacture of other chemicals) is not considered to be within the condition of use of TCE manufacturing. Relatedly, EPA is excluding from this rule processing of byproduct TCE when that byproduct TCE is processed within a site-limited, physically enclosed system that is part of the same overall manufacturing process from which the byproduct substance was generated. Site-limited means a chemical substance is manufactured and processed only within a site and is not distributed for commercial purposes as a chemical substance or as part of a mixture or product outside the site. In this way, EPA is aligning with the definition of "site-limited" in 40 CFR 711.3 and site-limited, physically enclosed systems in 40 CFR 711.10(d)(1).

Finally, as discussed in the 2023 TCE proposed rule, while EPA generally views the disposal condition of use under TSCA broadly, this rule is intended to address identified risks resulting from disposal of TCE to industrial pre-treatment, industrial treatment, or a POTW. Thus, only these limited disposal activities, including remediation methods that would be considered industrial wastewater pretreatment, industrial wastewater treatment, or discharge to a POTW, are included within the disposal condition of use in this rule. A remediation method would need to be considered one of these three types of disposal to fall within the condition of use under TSCA, and if not, would not be subject to the prohibition or other requirements of the rule.

B. Prohibition of Manufacture, Processing, Distribution in Commerce, Use, and Disposal

In general, EPA is finalizing the prohibitions as proposed with some modifications, including for compliance timeframes to provide for reasonable transitions and based on consideration of the public comments, as described in Unit III. This unit describes the prohibitions and associated compliance timeframes EPA is finalizing in this rule. As discussed in Unit IV.A. and in

the Response to Comments document (Ref. 11), the prohibitions do not apply to any substance that is excluded from the definition of "chemical substance" under TSCA section 3(2)(B)(ii) through (vi) (Ref. 11).

1. Prohibition of Manufacture, Processing, Distribution, and Industrial and Commercial Use of TCE

The final rule prohibits manufacture, processing, distribution in commerce, and all industrial and commercial use of TCE and TCE-containing products. The final regulation will impose prohibitions in a staggered timeframe, beginning at the top of the supply chain, as proposed. EPA is finalizing as proposed the timeframes for prohibition on manufacturing, processing, distribution in commerce, and industrial and commercial use of TCE unless otherwise specified. These timeframes are: a prohibition on manufacturing (including importing) TCE beginning 90 days from publication of this final rule, a prohibition on processing TCE beginning 180 days from publication of this final rule, a prohibition on distribution in commerce of TCE or TCE-containing products beginning 180 days from publication of this final rule, and a prohibition on industrial or commercial use of TCE and TCE-containing products beginning 270 days after publication of this final rule.

For several conditions of use, EPA is finalizing prohibitions that would take effect over a longer timeframe. After consideration of public comments, EPA is finalizing timeframes longer than proposed for prohibition of manufacture, processing, distribution, and commercial use of TCE for four uses: industrial and commercial use of TCE in energized electrical cleaner; industrial and commercial use of TCE in adhesives and sealants for aerospace applications; laboratory use of TCE in asphalt testing and recovery; and disposal of TCE to industrial pre-treatment, industrial treatment, or POTWs. EPA is finalizing a prohibition after 5 years, a timeframe shorter than proposed, for the industrial and commercial use of TCE as a processing aid for lithium battery separator manufacturing. The details of these and other timeframes for prohibition are described in this unit, and the rationale for these changes from the proposed rule is in Unit III.B.1. and Unit III.C. (EPA notes that for several conditions of use, in consideration of public comments and to provide for reasonable transitions, EPA is finalizing phase-outs ahead of immediate prohibitions (*e.g.*, for the processing of TCE for manufacture of HFC–134a), which are detailed in Units IV.B.3., 4., 5., and 6., or several time limited exemptions under TSCA section 6(g) (*e.g.*, for the industrial and commercial use of TCE for essential laboratory uses), which are detailed in Unit IV.G.)).

For two batch vapor degreasing conditions of use (open-top and closed-loop), EPA is finalizing as proposed the compliance dates for the prohibitions described in this unit. With certain exceptions, the prohibition on manufacturing and processing for this use comes into effect in 180 days for manufacturers and in 270 days for processors, including for processing into a formulation and for recycling. After 1 year, the prohibition on the industrial and commercial uses of TCE in open-top and closed-loop batch vapor degreasers comes into effect (see Unit III.B.1.c.i. and ii. of the 2023 TCE proposed rule for descriptions of these conditions of use and Unit VI.A.1. of the 2023 TCE proposed rule for a rationale for the slightly longer timeframe). As an exception, the use of TCE for batch vapor degreasing by Federal agencies and their contractors for land-based DoD defense systems will be prohibited after 5 years. (For a sub-set of the open-top and closed-loop batch vapor degreasing conditions of use, EPA is finalizing a phase-out for industrial and commercial use of TCE as a solvent for closed-loop batch vapor degreasing for rayon fabric scouring for end use in rocket booster nozzle production for Federal agencies and their contractors, as described in Unit IV.B.4. EPA is also finalizing several exemptions related to vapor degreasing, which are described in Unit IV.G.).

Additionally, for uses not separately distinguished under longer phase-out or exemption timeframes, EPA is finalizing as proposed the compliance dates for the prohibitions on the commercial use of TCE as a processing aid and the relevant upstream uses. Specifically, aside from several exceptions, the prohibitions on manufacturing and processing for this use would come into effect 540 days months after the date of publication for manufacturers and in 2 years for processors. The prohibition would come into effect after 2 years for industrial and commercial use of TCE as a processing aid for several applications (as specified in the condition of use name and description, this includes use of TCE as a processing aid in battery separator manufacturing; process solvent used in polymer fiber spinning, fluoroelastomer manufacture and Alcantara manufacture; extraction solvent used in caprolactam manufacture; and precipitant used in beta-cyclodextrin manufacture) (see Unit III.B.1.c.xvi. of the 2023 TCE proposed rule for a description of this condition of use and Unit V.A.1. of the 2023 TCE proposed rule for a rationale for the different timeframe). For a subset of the industrial and commercial use of TCE as a processing aid, specifically for the use of TCE as a processing aid in lithium battery separator manufacture, EPA is finalizing a longer timeframe of 5 years before prohibition.

EPA is finalizing as proposed the prohibition on manufacturing of TCE for processing as a reactant/intermediate after 540 days and the prohibition for processing TCE as a reactant/intermediate after two years, unless otherwise noted. EPA is finalizing as proposed an extended phase-out for a subset of this condition of use, specifically processing TCE as a reactant/intermediate for the manufacture of HFC–134a, which is detailed in Unit IV.B.3.

As described earlier in this unit, for three conditions of use, EPA is finalizing prohibition timeframes longer than proposed. EPA is providing 3 years after publication of the final rule (rather than within a year, as proposed) for the industrial and commercial use of TCE in energized electrical cleaner, and the manufacture, processing, and distribution in commerce for such use. Additionally, for the industrial and commercial use of TCE in adhesives and sealants for aerospace applications, and the manufacture, processing, and distribution in commerce for such use, prohibitions would take effect 5 years after publication of the final rule (rather than within a year, as proposed). For the industrial and commercial use of TCE in batch vapor degreasing for land-based DoD defense systems by Federal agencies and their contractors, and the manufacture, processing, and distribution in commerce for such use, prohibitions would take effect 5 years after publication of the final rule. These changes are based on consideration of the public comments, and the rationale is detailed in Unit III.C. and the Response to Comments document (Ref. 11).

Also in consideration of public comment, EPA is changing the timeframe for prohibition on the industrial and commercial use of TCE as a processing aid in manufacturing lithium battery separators. EPA had proposed that industrial and commercial use of TCE as a processing aid for all battery separators would, under TSCA section 6(g), be exempt from prohibition for 10 years. As detailed in Unit III.B.1., EPA has modified the exemption to apply only to use of TCE for manufacturing lead-acid

battery separators, and for the industrial and commercial use of TCE as a processing aid in lithium battery separator manufacture, and for its associated upstream uses and disposal, EPA is finalizing a separate prohibition that will take effect in five years.

To aid with implementation of the compliance dates for the prohibitions on manufacturing, processing, and industrial and commercial use of TCE, and ensure that those prohibitions effectively address the unreasonable risk identified, EPA is also finalizing prohibitions on distribution in commerce of TCE. Generally, for most conditions of use EPA is finalizing a compliance date for the prohibition on distribution in commerce of TCE that will come into effect 180 days following publication of the final rule. In instances where EPA is finalizing a prohibition on manufacturing and processing TCE for a particular industrial and commercial use that is later than 180 days after publication of the final rule, the compliance date for the prohibition on distribution in commerce will generally be the same as the compliance date of the prohibition on manufacturing and processing TCE.

In consideration of the irreversible health effects associated with TCE exposure and public comment, EPA is finalizing prohibition timeframes that allow for successful implementation of the prohibitions in a manner that is as soon as practicable while providing for a reasonable transition period, consistent with TSCA section 6(d). EPA has no reasonably available information indicating that the compliance dates are not practicable for the activities that would be prohibited, or that additional time is needed for products to clear the channels of trade.

2. Prohibition of Manufacture, Processing, and Distribution in Commerce for Consumer Use of TCE

The final rule prohibits the manufacture, processing, and distribution in commerce of TCE and TCE-containing products for all consumer use.

EPA emphasizes that the consumer uses evaluated in the 2020 Risk Evaluation for TCE constitute all known, intended, and reasonably foreseen consumer uses of TCE. As described in this unit, EPA is prohibiting all manufacturing (including import) and processing of TCE to address the unreasonable risk to workers and ONUs driven by those conditions of use (Ref. 2). EPA determined any extended phase-outs or 6(g) exemptions are unnecessary for prohibitions on manufacture (including import), processing, or distribution in commerce of TCE for consumer use. EPA notes that all but one of the 24 consumer uses of TCE evaluated in the 2020 Risk Evaluation for TCE contributed to the unreasonable risk determination for TCE (Refs. 1, 2). Additionally, a prohibition on the manufacture (including import) and processing of TCE for consumer uses generally supports reducing risk to workers and ONUs from these upstream uses, as further discussed in Unit V.A. EPA also considered the risk of irreversible health effects associated with TCE exposure when finalizing these compliance dates. For these reasons, including the severity of the hazards of TCE, EPA is prohibiting the manufacturing (including import), processing, and distribution in commerce of TCE for all uses, which includes all consumer uses.

The compliance dates for the final prohibitions described in this unit relevant to consumer uses will come into effect for manufacturers in 90 days, for processors in 180 days, and for distributors (including all retailers) within 180 days. EPA has no reasonably available information indicating these compliance dates are not practicable for the activities that are prohibited or that additional time is needed for products to clear the channels of trade.

EPA emphasizes that retailers are prohibited from distributing any TCE or TCE-containing products after June 16, 2025, including those TCE-containing products that can continue to be distributed or used commercially for a longer period of time. EPA is finalizing as proposed the prohibition on distributing in commerce TCE and all TCE-containing products to consumers, in order to prevent products intended for industrial and commercial use that have longer timeframes before prohibition from being purchased by consumers, and is clarifying that this prohibition applies to distribution by retailers. A retailer is any person or business entity that distributes or makes available products to consumers, including through e-commerce internet sales or distribution. If a person or business entity distributes or makes available any product to at least one consumer, then it is considered a retailer (40 CFR 751.5). For a distributor not to be considered a retailer, the distributor must distribute or make available products solely to commercial or industrial end-users or businesses. Prohibiting manufacturers (including importers), processors, and distributors from distributing TCE, or any products containing TCE, to retailers prevents retailers from making those products available to consumers, which addresses that part of the unreasonable risk from TCE contributed by consumer use.

In consideration of the irreversible health effects associated with TCE exposure and public comment, in this final rule EPA is finalizing prohibition timeframes that allow for successful implementation of the prohibitions in a manner that is as soon as practicable while providing for a reasonable transition period, consistent with TSCA section 6(d). EPA has no reasonably available information indicating these compliance dates are not practicable for the activities that are prohibited or that additional time is needed for products to clear the channels of trade.

3. Phase-Out for Processing TCE as an Intermediate for the Manufacture of HFC–134a

As described in this unit, EPA is finalizing as proposed a longer phase-out timeframe for the manufacturing (including import) and processing of TCE as an intermediate for the manufacture of HFC–134a (1,1,1,2-tetrafluroethane; CASRN 811–97–2). EPA is finalizing an 8.5-year phase-out subject to the requirements discussed in this unit. All other processing of TCE as a reactant/intermediate will be subject to the prohibitions described in Unit IV.B.2. EPA will require a phase-out for processing of TCE as an intermediate for the manufacture of HFC–134a, which EPA will begin at the final rule's publication date and end 8.5 years after the publication of the final rule. Associated with this phase-out, EPA will require the establishment of the TCE WCPP, outlined in Unit IV.C. within 180 days after publication of the final rule, as workplace protections during the period of the phase-out. To set the volume reductions during the phase-out, EPA will require any facility processing TCE as an intermediate to manufacture HFC–134a in the United States to establish a baseline of the annual quantity of TCE processed by the facility as a feedstock to manufacture HFC–134a. EPA is requiring that within 180 days after the publication of the final rule the manufacturer could use the average of any 12 consecutive months in the 3 years preceding the publication of the final rule to calculate their baseline, based on records that demonstrate how the baseline annual volume was calculated. Following the establishment of a baseline volume, the regulated entity will then be required to implement a 4-step phase-out process; specifically, the phase-out will be a 25 percent reduction from the baseline volume every 2 years as follows: (1) 2.5 years after the publication of the final

rule each manufacturer of HFC–134a who processes TCE as an intermediate is not permitted to process TCE as an intermediate at an annual volume greater than 75 percent of the baseline; (2) 4.5 years after the publication of the final rule each manufacturer of HFC–134a who processes TCE as an intermediate is not permitted to process TCE as an intermediate at an annual volume greater than 50 percent of the baseline; (3) 6.5 years after the publication of the final rule each manufacturer of HFC–134a who processes TCE as an intermediate is not permitted to process TCE as an intermediate at an annual volume greater than 25 percent of the baseline; and (4) 8.5 years after the publication of the final rule each manufacturer of HFC–134a is prohibited from processing TCE as an intermediate.

EPA notes that the prohibition for manufacture (including importing), processing, and distribution in commerce of TCE for this condition of use will occur after 8.5 years to account for availability of TCE through the supply chain during the period of the phase-out of processing of TCE as an intermediate for the manufacture of HFC–134a. This timeframe will be longer than the prohibitions on manufacturing and processing TCE described in Unit IV.B.1. of this final rule.

EPA is also finalizing the requirement that regulated entities keep records of the annual quantity of TCE purchased and processed from the year 2023 until the termination of all processing of TCE as an intermediate. These records, along with the records demonstrating how the baseline annual volume was calculated, must be kept until five years after the processing of TCE as an intermediate ends.

EPA notes, per TSCA section 6(c)(2)(C), that although the processing of TCE to produce HFC–134a is prohibited eventually, processing PCE to produce HFC–134a will continue under a WCPP (RIN 2070–AK84). Although PCE is an alternative intermediate for the manufacture of HFC–134a, EPA has found that an 8.5-year phaseout for TCE is necessary because manufacturers who use TCE as an intermediate are not able to simply retrofit plants to use PCE. Therefore, a more immediate prohibition of the use of TCE for this condition of use could abruptly disrupt the domestic supply of HFC–134a and could adversely affect the gradual transition to new technologies driven by the AIM Act. However, EPA believes the transition period is reasonable because over the time period of the phaseout, EPA determined the transition to imported HFC–134a or HFC–134a manufactured with PCE could be made and, as such, the refrigerant would remain available while protecting workers.

4. Phase-Out of Industrial and Commercial Use of TCE as a Solvent for Closed-Loop Batch Vapor Degreasing for Rayon Fabric Scouring for Rocket Booster Nozzle Production

EPA is finalizing as proposed a longer phase-out timeframe for industrial and commercial use of TCE as a solvent for closed-loop batch vapor degreasing for rayon fabric scouring for end use in rocket booster nozzle production by Federal agencies and their contractors. This is the industrial and commercial use of TCE in a closed-loop batch vapor degreaser to clean, or 'scour,' rayon fabric to remove sizing (*i.e.*, protective filler or glaze on textiles), oils, and other contaminants from the rayon fabric that is used to line the inside of rocket booster nozzles; the degreasing is essential in preparing the rayon fabric before a carbonization process ahead of being used in the rocket booster nozzles. If contaminants are not removed properly from the rayon, the result could include nozzle failure (Ref. 44). More information on this use and the rationale for the phase-out are in Unit VI.A.1. of the proposed rule. For this sub-set of the vapor degreasing condition of use, when conducted by Federal agencies and their contractors, EPA is finalizing a 10-year phase-out subject to the requirements discussed in this unit. (All other industrial and commercial use of TCE as a solvent for vapor degreasing, including use of TCE in closed-loop batch vapor degreasing of other parts or materials, will be subject to the prohibitions described in Unit IV.B.2.). For the phase-out, within 5 years of the publication date of the final rule the Federal agency that is the end user of the rayon fabric for rocket booster nozzle production (*e.g.*, the DOD or NASA) will need to conduct a final pre-launch test of rocket boosters without using TCE; this test is further discussed in Unit VI.A.1.a. of the 2023 TCE proposed rule. By 10 years from the publication date of the final rule, the phase-out will be complete and industrial and commercial use of TCE as a solvent for closed-loop batch vapor degreasing, including for rayon fabric scouring for end use in rocket booster nozzle production by Federal agencies and their contractors, is prohibited. As part of this phase-out, EPA is requiring a TCE WCPP, described in Unit IV.C., within 180 days after publication of the final rule, as workplace protections during the period of the phase-out until the full prohibition takes effect. Additionally, this phase-out will include recordkeeping requirements beginning 270 days after publication of the final rule related to the rayon fabric scouring for end use in rocket booster nozzle production. The entity must have records from a Federal agency indicating that their closed-loop batch vapor degreasing with TCE is for rayon fabric scouring for end use in rocket booster nozzle production for a Federal agency or a contractor. Beginning 5 years after the publication of the final rule, to continue to use TCE for closed-loop batch vapor degreasing for this specific use, the user must have records from a Federal agency indicating that a final pre-launch test for the rayon fabric scouring has been conducted with an alternative chemical or process. As a condition of this phase-out, entities will be required to transition from TCE and to switch to use of the tested alternative if it proves to be a suitable alternative.

5. Phase-Out of Laboratory Use of TCE in Asphalt Testing And Recovery

As discussed in more detail in Unit III.C.3., EPA is finalizing a longer phase-out timeframe for industrial and commercial use of TCE in laboratory testing of asphalt. Specifically, EPA is finalizing a phase-out of 10 years for the industrial and commercial use of TCE in asphalt testing and recovery, with a prohibition on use of TCE in manual centrifuge processes at 5 years. As part of this phase-out, EPA is requiring a TCE WCPP, described in Unit IV.C., within 180 days after publication of the final rule, as workplace protections during the period of the phase-out until the full prohibition takes effect.

6. Phase-Out of Disposal of TCE to Industrial Pre-Treatment, Industrial Treatment, or POTWs

EPA is prohibiting the disposal of TCE to industrial pre-treatment, industrial treatment, or publicly owned treatment works, *i.e.*, wastewater that contains TCE that is collected and/or treated on site or transported to a third party site, and includes the mixing of TCE with wastewater and the discharge of TCE-contaminated wastewater (description of disposal for the purposes of this rulemaking is in Units IV.C.1.d. and IV.E.1.). TSCA section 6(a) provides EPA the authority to prohibit or otherwise regulate any manner or method of disposal of a chemical substance by its manufacturer, processor, or any other person who uses or disposes of the chemical substance for commercial purposes. Facilities generating solid waste with TCE concentrations at or above the RCRA

regulatory level of 0.5 mg/L using the Toxicity Characteristic Leaching Procedure (see 40 CFR 261.24) (or solid waste that is otherwise hazardous under RCRA Subtitle C) will need to manage the waste in compliance with all applicable RCRA requirements. This includes a ban on dilution as a substitute for adequate treatment (40 CFR 268.3).

The compliance date for the prohibition described in this unit will be September 15, 2025 for manufacturers, processors, distributors, and industrial and commercial users disposing of TCE to industrial pre-treatment, industrial treatment, or publicly owned treatment works. EPA has no reasonably available information indicating that for the majority of users the proposed compliance dates would not be as soon as practicable and would not provide a reasonable transition period for converting to an alternative disposal method.

For a small set of uses, EPA has determined that wastewater disposal is an essential part of the ongoing industrial and commercial use, as described in Units III.B.1. and III.B.2. EPA is therefore finalizing extended phase-outs of wastewater disposal for certain conditions of use that have extended compliance timeframes or an exemption under TSCA section 6(g). The following conditions of use will be able to continue to dispose of TCE to industrial pre-treatment, industrial treatment, and POTWs: the industrial and commercial use of TCE as a processing aid in lithium battery separator manufacturing will have 5 years after the publication date of the final rule; the industrial and commercial use of TCE as a processing aid for specialty polymeric microporous sheet material manufacturing will have 15 years; and the industrial and commercial use of TCE as a processing aid in lead-acid battery separator manufacturing will have 20 years. During the time these conditions of use are continuing consistent with a TSCA section 6(d) phase-out or 6(g) exemption, EPA is requiring that the industrial pre-treatment and/or industrial treatment of wastewater containing TCE from these conditions of use will also be subject to the WCPP described in Unit IV.C. This is distinct from conditions for workplace requirements for the time-limited exemption under TSCA section 6(g) for disposal of TCE to industrial pre-treatment and/or industrial treatment, to support ongoing critical processing aid uses and to facilitate cleanup projects of TCE-contaminated groundwater and other wastewater generated from the cleanup of historical waste disposal sites, which are described in Unit IV.E.2. POTWs receiving TCE-containing wastewater, regardless of source, will be required to meet the worker protections described in Unit IV.E.3.

C. WCPP for Certain Conditions of Use

1. Applicability

EPA is finalizing a WCPP for those conditions of use that will continue temporarily for more than 1 year under a phase-out or a TSCA section 6(g) exemption. The final WCPP differs in certain aspects from the WCPP as proposed; the rationale for these changes are discussed in Unit III.A. EPA is finalizing the WCPP for the following conditions of use of TCE: domestic manufacturing; import; processing as a reactant/intermediate; processing into formulation, mixture or reaction product; processing by repackaging; recycling; industrial and commercial use as a processing aid in process solvent used in battery manufacture; process solvent used in polymer fabric spinning, fluoroelastomer manufacture and Alcantara manufacture; extraction solvent used in caprolactam manufacture; precipitant used in beta-cyclodextrin manufacture; industrial and commercial use as an adhesive and sealant for essential aerospace applications; industrial and commercial use of in batch vapor degreasing for land-based DoD defense systems; industrial and commercial use in other miscellaneous industrial and commercial uses (laboratory use) industrial and commercial use as a solvent in closed-loop batch vapor degreasing for rayon fabric scouring for end use in rocket booster nozzle production by Federal agencies and their contractors; industrial and commercial use in closed-loop or open-top batch vapor degreasing for essential aerospace parts and narrow tubing used for medical devices; industrial and commercial use for vessels of the Armed Forces and their systems; industrial and commercial use of TCE as a solvent in closed-loop vapor degreasing necessary for rocket engine cleaning by Federal agencies and their contractors; and disposal to industrial pre-treatment, industrial treatment, and POTWs. This Unit provides a description of those uses that will continue for more than 1 year under the WCPP to assist with compliance. In some instances, the description is of a subset of a larger condition of use assessed in the 2020 Risk Evaluation for TCE.

a. Manufacturing (Includes Import)

i. Domestic Manufacture

This condition of use refers to the making or producing of a chemical substance within the United States (including manufacturing for export), or the extraction of a component chemical substance from a previously existing chemical substance or a complex combination of substances. For purposes of this rule, this description does not apply to TCE production as a byproduct, including during the manufacture of 1,2-dichloroethane, which EPA intends to consider in the risk evaluation for 1,2-dichloroethane (Ref. 83).

ii. Import

This condition of use refers to the act of causing a chemical substance or mixture to arrive within the customs territory of the United States.

b. Processing

i. Processing as a Reactant/Intermediate

This condition of use refers to processing TCE in chemical reactions for the manufacturing of another chemical substance or product. Through processing as a reactant or intermediate, TCE serves as a feedstock in the production of another chemical product via a chemical reaction in which TCE is completely consumed. For example, TCE is processed as an intermediate in the production of 1,1,1,2-tetrafluoroethane, an HFC also known as HFC–134a, which is used as a refrigerant and in fluorocarbon blends for refrigerants. This condition of use includes reuse of TCE, including TCE originally generated as a byproduct or residual TCE, as a reactant.

ii. Processing: Incorporation Into a Formulation, Mixture, or Reaction Product

This condition of use refers to when TCE is added to a product (or product mixture) prior to further distribution of the product. Such products include, but are not limited to, solvents (for cleaning or degreasing), adhesives and sealant chemicals, and solvents that become part of a product formulation or mixture (*e.g.*, lubricants and greases, paints and coatings, other uses).

iii. Processing: Repackaging

This condition of use refers to the preparation of a chemical substance for distribution in commerce in a different form, state, or quantity. This includes but is not limited to transferring the chemical from a bulk container into smaller containers.

iv. Processing: Recycling

This condition of use refers to the process of managing used solvents that are collected, either on-site or transported to a third-party site, for commercial purposes other than disposal. Spent solvents can be restored via solvent reclamation/recycling. Waste solvents can be restored to a condition that permits reuse via solvent reclamation/recycling. The recovery process may involve an initial vapor recovery or mechanical separation step followed by distillation, purification, and final packaging.

c. Industrial and Commercial Use

i. Industrial and Commercial Use as a Processing Aid in: Process Solvent Used in Battery Manufacture; Process Solvent Used in Polymer Fabric Spinning, Fluoroelastomer Manufacture and Alcantara Manufacture; Extraction Solvent Used in Caprolactam Manufacture; and Precipitant Used in Beta-Cyclodextrin Manufacture

This condition of use refers to industrial and commercial use of TCE to improve the processing characteristics or the operation of process equipment when added to a process or to a substance or mixture to be processed. The chemical substance is not intended to remain in or to become a part of the reaction product nor has function in the reaction product.

ii. Industrial and Commercial Use as an Adhesive and Sealant for Essential Aerospace Applications

This condition of use refers to the industrial and commercial use of TCE in adhesive and sealant products, *e.g.*, in products to promote bonding between other substances, promote adhesion of surfaces, or prevent seepage of moisture or air, for essential aerospace applications. In particular, this includes use of TCE as an adhesive or sealant in aircraft pneumatic deicing boots; in solvent bonding of plastic components, including on Oxygen Container Assemblies for Passenger Service Unit products used in aircraft; and as an adhesive or sealant for flight-critical equipment on new and existing aircraft, both commercial and military.

iii. Miscellaneous Industrial and Commercial Uses: Laboratory Use

This condition of use refers to the industrial and commercial use of TCE in an established laboratory, for example a laboratory program accredited by the AIHA (*e.g.*, AIHA LAP, LLC Policy Module 2A/B/E of Revision 17.3), or other analogous industry-recognized program for chemical analysis (*e.g.*, to test hot mix asphalt binder content, as a reference standard, etc.), chemical synthesis, extracting and purifying other chemicals, dissolving other substances, and similar activities.

iv. Industrial and Commercial Use as Solvent for Closed-Loop Batch Vapor Degreasing for Rayon Fabric Scouring for End Use in Rocket Booster Nozzle Production

This condition of use refers to the process of heating TCE to its volatilization point and using its vapor to remove dirt, oils, greases, and other surface contaminants (such as drawing compounds, cutting fluids, coolants, solder flux, and lubricants) for rayon fabric scouring for end use in rocket booster nozzle production by Federal agencies and their contractors, in closed-loop batch vapor degreasers.

v. Industrial and Commercial Use as Solvent for Closed-Loop or Open-Top Batch Vapor Degreasing for Essential Aerospace Parts and for Narrow Tubing for Medical Devices

This condition of use refers to the process of heating TCE to its volatilization point and using its vapor to remove dirt, oils, greases, and other surface contaminants (such as drawing compounds, cutting fluids, coolants, solder flux, and lubricants) from essential aerospace parts and components where alternatives present technical feasibility or cleaning performance challenges in meeting Federal agency specifications or long-standing design specifications and from narrow tubing intended for use in medical devices (*e.g.*, tubing where a portion of the outside diameter is 0.625 inches or less), in open-top batch or closed-loop batch vapor degreasers.

vi. Industrial and Commercial Use for Vessels of the Armed Forces and Their Systems, and in the Maintenance, Fabrication, and Sustainment for and of Such Vessels and Systems

This condition of use refers to the industrial and commercial use of TCE for vessels of the Armed Forces and their systems, and in the maintenance, fabrication, and sustainment for and of such vessels and systems: as potting compounds for naval electronic systems and equipment; sealing compounds for high and ultra-high vacuum systems; bonding compounds for materials testing and maintenance of underwater systems and bonding of nonmetallic materials; and cleaning agents to satisfy cleaning requirements (which includes degreasing using wipes, sprays, solvents and vapor degreasing) for: materials and components required for military ordnance testing; temporary resin repairs in vessel spaces where welding is not authorized; ensuring polyurethane adhesion for electronic systems and equipment repair and installation of elastomeric materials; various naval combat systems, radars, sensors, equipment; fabrication and prototyping processes to remove coolant and other residue from machine parts; machined part fabrications for naval systems; installation of topside rubber tile material aboard vessels; and vapor degreasing required for substrate surface preparation prior to electroplating processes.

vii. Industrial and Commercial Use as a Solvent for Closed-Loop Batch Vapor Degreasing Necessary for Rocket Engine Cleaning by Federal Agencies and Their Contractors

This condition of use refers to the process of heating TCE to its volatilization point and using its vapor to remove dirt, oils, greases, and other surface contaminants (such as drawing compounds, cutting fluids, coolants, solder flux, and lubricants), for rocket engine cleaning by Federal agencies and their contractors. This involves cleaning small diameter parts, such as rocket engine nozzle coolant tubes, and removing the fluids used for manufacturing.

viii. Industrial and Commercial Use of TCE for Batch Vapor Degreasing for Land-Based DoD Defense Systems by Federal Agencies and Their Contractors

This condition of use refers to the process of heating TCE to its volatilization point and using its vapor to remove dirt, oils, greases, and other surface contaminants (such as drawing compounds, cutting fluids, coolants, solder flux, and lubricants), for land-based DoD defense systems cleaning by Federal agencies and their contractors.

d. Disposal

This condition of use generally refers to the process of disposing of generated waste streams that are either collected on-site or transported to a third-party site and typically includes both processing for disposal as well as distribution in commerce for disposal. For this rule, this includes the mixing of TCE with wastewater and the discharge of TCE-contaminated wastewater pursuant to a National Pollutant Discharge Elimination System (NPDES) permit, and specifically includes discharge to industrial pre-treatment, industrial treatment, or publicly owned treatment works. The evaluation of the disposal condition of use in the 2020 Risk Evaluation for TCE

(Ref. 1) was limited to the disposal of TCE-containing wastewater and did not address disposal activities not involving TCE in wastewater. Therefore, EPA considers disposal activities not involving TCE in wastewater to be outside of the scope of this rule. This means that, for example, a facility that generates TCE as a byproduct, isolates the TCE from the process for the sole purpose of disposal, and sends it off-site for disposal to a hazardous waste incinerator permitted under RCRA is not covered by this final rule.

2. Overview

A WCPP encompasses inhalation exposure thresholds, includes monitoring and recordkeeping requirements to verify that those thresholds are not exceeded, and may include other components, such as dermal protection. Under a WCPP, owners or operators have some flexibility, within the parameters outlined in this Unit, regarding how they prevent exceedances of the identified EPA exposure limit thresholds. In the case of TCE, EPA has determined that meeting the EPA exposure limit thresholds for certain occupational conditions of use is necessary to protect health from inhalation risks during phaseouts and while exempted activities are ongoing.

Implementation of the WCPP would have to begin by June 16, 2025 or within 30 days of introduction of TCE into the workplace, whichever is later, at which point entities would have to have completed their initial monitoring (as described in Unit IV.C.4.b.). Additionally, EPA requires that each owner or operator ensure that the airborne concentration of TCE does not exceed the interim ECEL for all potentially exposed persons no later than September 15, 2025, and the implementation of any needed exposure controls based on initial monitoring and development of an exposure control plan no later than September 15, 2025 (as described in Unit IV.C.6.).

EPA uses the term "potentially exposed person" in this Unit and in the regulatory text to include workers, ONUs, employees, independent contractors, employers, and all other persons in the work area where TCE is present and who may be exposed to TCE under the conditions of use for which a WCPP or specific prescriptive controls would apply. As defined in 40 CFR 751.5, "*Potentially exposed person* means any person who may be exposed to a chemical substance or mixture in a workplace as a result of a condition of use of that chemical substance or mixture." EPA notes that this definition is intended to apply to occupational workspaces as part of implementation of the WCPP and other restrictions. One important reason to define a potentially exposed person for the purposes of a WCPP as any person who may be exposed in the workplace is to emphasize the broad scope of exposures which must be categorized when implementing a WCPP. EPA notes that this definition is intended to apply only in the context of risk management, and specifically in the context of a WCPP (*e.g.*, workers directly using the chemical, workers in the vicinity of the use, students in a laboratory setting). The term is not intended as a replacement for the term Potentially Exposed or Susceptible Subpopulation as defined by TSCA section 3(12). EPA additionally recognizes that other individuals or communities may be exposed to TCE as consumers, members of fenceline communities, or members of the general population, which is separate and apart from those potentially exposed for the purposes of the regulatory requirements of the WCPP. In those instances, where regulatory requirements address exposures unrelated to a WCPP, EPA would use distinct terminology to refer to those other populations. For conditions of use that will continue for longer than 1 year, such as those under a phaseout or a TSCA section 6(g) exemption, EPA requires a comprehensive WCPP, prescriptive controls, or wastewater worker protections to reduce exposures to TCE for potentially exposed persons, *e.g.*, persons directly handling the chemical or in the area where the chemical is being used. Similarly, the 2020 Risk Evaluation for TCE (Ref. 1) did not distinguish between employers, contractors, or other legal entities or businesses that manufacture, process, distribute in commerce, use, or dispose of TCE. For this reason, EPA uses the term "owner or operator" to describe the entity responsible for implementing the WCPP, prescriptive controls, or wastewater worker protection provisions in any workplace where an applicable condition of use identified in the following paragraph and subject to the WCPP or controls is occurring. The term includes any person who owns, leases, operates, controls, or supervises such a workplace. While owners or operators remain responsible for ensuring compliance with the WCPP requirements, prescriptive controls, or wastewater worker protections in the workplace, they may contract with others to provide training or implement a respiratory protection program, for example. For the provisions in this rule, any requirement for an owner or operator or an owner and operator is a requirement for any individual that is either an owner or an operator.

EPA emphasizes that this approach is essential for protecting health from the risks presented by TCE during the term of a phaseout or exemption, including to individuals who may not be covered by OSHA requirements, such as volunteers, self-employed persons, and state and local government workers who are not covered by an OSHA-Approved State Plan. EPA uses the term "owner or operator" in TSCA programs because the term is used in other EPA programs to describe persons with responsibilities for implementing statutory and regulatory requirements at particular locations. See, for example, section 113 of the Clean Air Act (CAA), 42 U.S.C. 7412, which defines "owner or operator" as a person who owns, leases, operates, controls, or supervises a stationary source. There is a similar definition in section 306 of the Clean Water Act (CWA), 33 U.S.C. 1316. EPA understands that the use of this term may result in multiple entities bearing responsibility for complying with provisions of this final rule, including the WCPP. However, this is also the case for workplaces regulated by OSHA, including those regulated under OSHA's general industry standards at 29 CFR part 1910.

OSHA's 1999 Multi-Employer Citation Policy explains which employers should be cited for a hazard that violates an OSHA standard (Ref. 84). The Policy describes four different roles that employers may fill at a workplace and describes who should be cited for a violation based on factors such as whether the employer created the hazard, had the ability to prevent or correct the hazard, and knew or should have known about the hazard. More than one employer may be cited for the same hazard. This final rule will have similar results, in that more than one owner or operator may be responsible for compliance.

The OSHA multi-employer citation policy is an example of a guidance governing situations where more than one regulated entity is present. EPA has received several requests for clarification of the applicability of the term "owner or operator" to sites where more than one entity owns, leases, or controls a workplace where a TCE condition of use is ongoing and where implementation of the WCPP is required. EPA understands that there are a wide variety of situations where these questions could arise, and plans to issue guidance consistent with TSCA

authorities that explains how EPA will approach the issue of responsibility for implementation of, and compliance with, the WCPP requirements in practice.

EPA's implementation of the interim ECEL as part of a WCPP aligns with, to the extent possible, certain elements of the existing OSHA standards for regulating toxic and hazardous substances under 29 CFR part 1910, subpart Z. However, EPA is finalizing a new, lower occupational exposure limit for TCE, based on the TSCA 2020 Risk Evaluation for TCE, public comments, and other information as discussed in Unit III.A.1., while aligning with existing requirements wherever possible. For TCE, the WCPP and other workplace controls in this final rule are necessary to protect against health risks from exposures to TCE while conditions of use are being phased out or are ongoing during the term of a TSCA section 6(g) exemption and provide the familiarity of a pre-existing framework for the regulated community.

This Unit includes a summary of the WCPP, including a description of the finalized exposure limits including an interim ECEL and an interim ECEL action level; implementation requirements including monitoring requirements; a description of potential exposure controls in accordance with the hierarchy of controls, including engineering controls, administrative controls, and PPE as it relates to dermal protection and respirator selection; and additional finalized requirements for recordkeeping, workplace participation, and notification. This Unit also describes compliance timeframes revised from the proposed rule, changes by EPA to certain provisions of the WCPP based on public comments, and addition of new provisions in the WCPP based on public comments used to inform this final rule.

3. Interim Existing Chemical Exposure Limit (ECEL), EPA Action Level

As discussed in Unit III.A.1., EPA is finalizing an interim ECEL under TSCA section 6(a) of 0.2 ppm as an 8-hour TWA based on the health effects of TCE, the infeasibility of measuring the proposed ECEL of 0.0011 ppm, and other factors. By interim ECEL, EPA means an ECEL that is in place only for the timeframes indicated for each condition of use, after which prohibitions would take effect. EPA has determined that ensuring exposures remain at or below the 8-hour TWA ECEL of 0.2 ppm is necessary to protect health for those conditions of use that will continue for more than a year.

EPA is also finalizing an interim ECEL action level at half of the 8-hour interim ECEL, or 0.1 ppm as an 8-hour TWA. The interim ECEL action level is a definitive cut-off point below which certain compliance activities, such as periodic monitoring, are not required as described further in this Unit. In this way, EPA's WCPP for TCE aligns with other familiar chemical-specific frameworks in the OSHA standards for regulating toxic and hazardous substances under 29 CFR part 1910, subpart Z that establish an action level. As explained by OSHA, the decision to set the action level at one-half the PEL was based on its successful experience using this fraction as the action level in many standards (*e.g.*, arsenic, ethylene oxide, vinyl chloride and benzene); for most workplaces, the agency found that variability in employee exposures is normally such that an action level set at one-half the TWA PEL is appropriate (Ref. 85).

In summary, this final rule requires owners or operators to ensure the airborne concentration of TCE within the personal breathing zone of potentially exposed persons remains at or below 0.2 ppm as an 8-hour TWA ECEL after September 15, 2025, or beginning 120 days after introduction of TCE into the workplace if TCE use commences after June 16, 2025. EPA is also finalizing an action level of 0.1 ppm as an 8-hour TWA. For the purposes of this rulemaking, EPA will interpret personal breathing zone consistent with how OSHA defines it, as a hemispheric area forward of the shoulders within a six-to-nine-inch radius of a worker's nose and mouth and requires that exposure monitoring air samples be collected from within this space (Ref. 86). EPA is finalizing the interim ECEL for most of those occupational conditions of use that will continue for more than a year to ensure that no person is exposed to inhalation of TCE in excess of these concentrations resulting from those conditions of use (for a small number of occupational conditions of use, EPA is finalizing prescriptive controls or other workplace requirements, as described in more detail in Units IV.D and E). As discussed in Unit III.A.1., one of the considerations in finalizing this interim ECEL is the availability of sampling and analytical methods sufficient to accurately detect TCE concentrations at the proposed ECEL and ECEL action level. OSHA, NIOSH, and EPA sampling methods (both active and passive) with sufficient limits of quantification are available to support WCPP implementation (Ref. 87).

4. Monitoring Requirements

a. In General

Initial monitoring for TCE is critical for establishing a baseline of exposure for potentially exposed persons; similarly, periodic exposure monitoring assures continued compliance over time so that potentially exposed persons are not exposed to levels above the interim ECEL. Exposure monitoring could be suspended if certain conditions described in this Unit are met. Also, in some cases, a change in workplace conditions with the potential to impact exposure levels would warrant additional monitoring, which is also described.

EPA is finalizing with modifications from proposal its requirement that owners or operators determine each potentially exposed person's exposure by either taking a personal breathing zone air sample of each potentially exposed person's exposure or by taking personal breathing zone air samples that are representative of each potentially exposed person with a similar exposure profile to a chemical substance or mixture based on the substantial similarity of tasks performed, the manner in which the tasks are performed, and the materials and processes with which they work (hereinafter identified as an "exposure group"). Personal breathing zone air samples are representative of the 8-hour TWA of all potentially exposed persons in an exposure group if the samples are of the full shift-exposure of at least one person who represents the highest potential TCE exposures in that exposure group. In addition, the initial monitoring will be required when and where the operating conditions are best representative of each potentially exposed person's work-shift exposures. Personal breathing zone air samples taken during one work shift may be used to represent potentially exposed person exposures on other work shifts where the owner or operator can document that the tasks performed and conditions in the workplace are similar across shifts. Additionally, air sampling is required to measure ambient concentrations for TCE without taking respiratory protections into account as sampling is being performed. For purposes of exposure monitoring requirements, owners and operators are only required to monitor potentially exposed persons that are expected to be present in the workplace.

EPA is also finalizing requirements that the owner or operator ensure, for initial and periodic monitoring, that their exposure monitoring methods are accurate to a confidence level of 95%

and are within (plus or minus) 25% of airborne concentrations of TCE above the 8-hour TWA interim ECEL. To ensure compliance for monitoring activities, EPA is finalizing recordkeeping requirements and will require that owners or operators document their choice of monitoring method outlined in this Unit. As described in Unit III.A.3., EPA is finalizing the requirement that owners or operators meet certain documentation requirements for each monitoring event of TCE, including compliance with GLP Standards in accordance with 40 CFR part 792 or use of a laboratory accredited by the AIHA (*e.g.*, AIHA LAP, LLC Policy Module 2A/B/E of Revision 17.3), or other analogous industry-recognized program. Additionally, as described in Unit III.A.3., EPA is finalizing the requirement that owners or operators must re-monitor within 15 working days after receipt of any exposure monitoring when results indicate non-detect, unless an Environmental Professional as defined at 40 CFR 312.10 or a Certified Industrial Hygienist reviews the monitoring results and determines re-monitoring is not necessary.

For each monitoring event of TCE, EPA is requiring that the owner or operator record relevant information, including but not limited to, the quantity, location(s), and manner of TCE in use at the time of each monitoring event; the dates, durations, and results of each sample taken; and the name, work shift, job classification, work area, and type of respiratory protection (if any) worn by each monitored person. EPA further requires documentation of the following whenever monitoring for the WCPP is required:

(i) All measurements that may be necessary to determine the conditions (*e.g.*, work site temperatures, humidity, ventilation rates, monitoring equipment type and calibration dates) that may affect the monitoring results;

(ii) Identification of all other potentially exposed persons that a monitored person is intended to represent if using a representative sample;

(iii) Use of appropriate sampling and analytical methods;

(iv) Compliance with the GLP Standards at 40 CFR part 792 or any accredited lab including AIHA (*e.g.*, AIHA LAP, LLC Policy Module 2A/B/E of Revision 17.3), or other analogous industry-recognized program;

(v) Information regarding air monitoring equipment, including type, maintenance, calibrations, performance tests, limits of detection, and any malfunctions.

b. Initial Exposure Monitoring

Under the final rule, each owner or operator of a facility engaged in one or more of the conditions of use listed earlier in Unit IV.C.1., except disposal, is required to perform initial exposure monitoring by June 16, 2025 or within 30 days of introduction of TCE into the workplace, whichever is later, to determine the extent of exposure of potentially exposed persons to TCE. Initial monitoring will notify owners and operators of the magnitude of possible exposures to potentially exposed persons with respect to their work conditions and environments. Based on the magnitude of possible exposures in the initial exposure monitoring, the owner or operator may need to increase or decrease the frequency of future periodic monitoring, adopt new exposure controls (such as engineering controls, administrative controls, and/or a respiratory protection program), or to continue or discontinue certain compliance activities such as periodic monitoring. In addition, the initial monitoring will be required when and where the operating conditions are best representative of each potentially exposed person's work-shift exposures. If the owner or operator chooses to use a sample that is representative of potentially exposed persons' work-shift exposures (rather than monitor every individual), such sampling should be representative (*i.e.*, taken from the breathing zone of potentially exposed persons and reflect duration appropriate exposure) of the most highly exposed persons in the workplace. Additionally, EPA expects that owners and operators will conduct initial exposure monitoring representative of all tasks that potential exposed persons are expected to do. EPA understands that certain tasks may occur less frequently or may reflect accidental exposures (for example, due to malfunction).

EPA also recognizes that some entities may already have objective exposure monitoring data. If the owner or operator has monitoring data conducted within five years prior to the publication date of the final rule and the monitoring satisfies all other requirements in Unit IV., including the requirement that the data represents the highest TCE exposures likely to occur under reasonably foreseeable conditions of use, the owner or operator may rely on such earlier monitoring results for the initial baseline monitoring sample. Prior monitoring data cannot be used where there has been a change in work conditions or practices that is expected to result in new or additional exposures.

As described in more detail later in this unit, the owner or operator must conduct periodic monitoring at least once every five years since its last monitoring. This periodic monitoring must be representative of all the potentially exposed persons in the workplace and the tasks that they are expected to do.

c. Periodic Exposure Monitoring

EPA is finalizing as proposed the following periodic monitoring for owners or operators. These finalized requirements are also outlined in Table 1.

- If the samples taken during the initial exposure monitoring reveal a concentration below the interim ECEL action level (<0.1 ppm 8-hour TWA), ECEL periodic monitoring is required at least once every five years, except when additional exposure monitoring (Unit IV.C.4.d.) measurements require it.
- If the most recent exposure monitoring concentration is at or above the interim ECEL action level (≥0.1 ppm 8-hour TWA) but at or below the interim ECEL (≤0.2 ppm 8-hour TWA), the owner or operator must repeat the periodic exposure monitoring within 180 days of the most recent exposure monitoring.
- If the most recent exposure monitoring concentration is above the interim ECEL (>0.2 ppm 8-hour TWA), the owner or operator must repeat the periodic exposure monitoring within 90 days of the most recent exposure monitoring.
- If the most recent (non-initial) exposure monitoring indicates that airborne exposure is below the interim ECEL action level, the owners or operators must repeat such monitoring within 180 days of the most recent monitoring until two consecutive monitoring measurements, taken at least seven days apart, are below the interim ECEL action level (<0.1 ppm 8-hour TWA), at which time the owner or operator must repeat the periodic exposure monitoring at least once every five years.
- In instances where an owner or operator does not manufacture, process, use, or dispose of TCE for a condition of use for which the WCPP is required over the entirety of time since the last required periodic monitoring event, the owner or operator is permitted to forgo the next periodic monitoring event. However, documentation of cessation of use of TCE is required and periodic monitoring must resume when the owner or operator restart any of the conditions of use listed in Unit IV.C.1., except disposal.

TABLE 1—PERIODIC MONITORING REQUIREMENTS

Air concentration condition	Periodic monitoring requirement
If the initial exposure monitoring concentration is below the interim ECEL action level.	Periodic exposure monitoring at least once every 5 years.
If the most recent exposure monitoring concentration is at or above the interim ECEL action level but at or below the interim ECEL.	Periodic exposure monitoring is required every 180 days of the most recent exposure monitoring.
If the most recent exposure monitoring concentration is above the interim ECEL.	Periodic exposure monitoring is required every 90 days of the most recent exposure monitoring.
If the two most recent (non-initial) exposure monitoring measurements, taken at least seven days apart within a 6-month period, indicate that airborne exposure is below the interim ECEL action level (<0.1 ppm 8-hr TWA).	Periodic exposure monitoring is required within five years of the most recent exposure monitoring.
If the owner or operator engages in a condition of use for which WCPP is required but does not manufacture, process, use, or dispose of TCE in that condition of use over the entirety of time since the last required monitoring event.	The owner or operator may forgo the next periodic monitoring event. However, documentation of cessation of use of TCE is required and periodic monitoring is required when the owner or operator resumes the condition of use.

Note: Additional scenarios in which monitoring may be required are discussed in Unit IV.C.4.d.

d. Additional Exposure Monitoring

EPA is finalizing that each owner or operator conduct additional exposure monitoring within 30 days after there has been a change in the production, process, control equipment, personnel or work practices that may reasonably be expected to result in new or additional exposures at or above the interim ECEL action level, or when the owner or operator has any reason to believe that new or additional exposures at or above the interim ECEL action level have occurred, for example if an owner or operator receives information from potentially exposed person(s) suggesting that such new or additional exposures may have occurred. Prior monitoring data cannot be used to meet this requirement. In the event of start-up or shutdown, or spills, leaks, ruptures or other breakdowns or unexpected releases that may lead to exposure to potentially exposed persons, EPA is finalizing that each owner or operator must conduct additional exposure monitoring of potentially exposed persons (using personal breathing zone sampling) within 30 days after the conclusion of the start-up or shutdown and/or the cleanup of the spill or repair of the leak, rupture, or other breakdown. Prior monitoring data cannot be used to meet this requirement. An additional exposure monitoring event may result in an increased frequency of periodic monitoring. For example, if the initial monitoring results from a workplace are above the interim ECEL action level, but below the interim ECEL, periodic monitoring is required every 180 days. If additional monitoring is performed because increased exposures are suspected, and the results are above the interim ECEL, subsequent periodic monitoring would have to be performed every 90 days. The required additional exposure monitoring should not delay implementation of any necessary cleanup or other remedial action to reduce the exposures to persons in the workplace.

5. Regulated Area

EPA is finalizing its requirement that the owner or operator demarcate any area where airborne concentrations of TCE exceeds or are reasonably expected to exceed the interim ECEL by September 15, 2025, or within 90 days after receipt of any exposure monitoring that indicates exposures exceeding the interim ECEL. To provide more clarity regarding how regulated areas must be demarcated, EPA has incorporated the language analogous to OSHA's regulated area requirements under the standards for toxic and hazardous substances (29 CFR part 1910, subpart Z) into this final rule. Owners and operators must demarcate regulated areas from the rest of the workplace in any manner that adequately establishes and alerts potentially exposed persons to the boundaries of the area and minimizes the number of authorized persons exposed to TCE within the regulated area. This can be accomplished using administrative controls (*e.g.*, highly visible signifiers) in multiple languages as appropriate (*e.g.*, whenever potentially exposed persons who are primarily Spanish-speaking are likely to be present, owners and operators should post additional highly visible signifiers in Spanish), placed in conspicuous areas. The owner or operator is required to restrict access to the regulated area from any potentially exposed person who lacks proper training or is otherwise unauthorized to enter.

6. Exposure Control Plan

EPA is finalizing its requirement that owners or operators implementing the WCPP use feasible exposure controls, including one or a combination of elimination, substitution, engineering controls, and administrative controls, prior to requiring the use of PPE (*i.e.*, respirators or gloves) as a means of controlling exposures below EPA's interim ECEL and/or prevent direct dermal contact with TCE for all potentially exposed persons, in accordance with the hierarchy of controls (Ref. 88). As this rule finalizes phaseout or time-limited exemption before prohibition, EPA encourages owners and operators to thoroughly investigate and implement elimination, substitution, and available engineering controls during the phase-out. If an owner or operator chooses to replace TCE with a substitute, EPA recommends careful review of the available hazard and exposure information on the potential substitutes to avoid a substitute chemical that might later be found to present an unreasonable risk of injury to health or the environment or be subject to regulation (sometimes referred to as a "regrettable substitution"). EPA expects that, for conditions of use for which EPA is finalizing a WCPP, compliance at most workplaces would be part of an established industrial hygiene program that aligns with the hierarchy of controls.

EPA is finalizing the requirement that regulated entities use the hierarchy of controls, instituting one or a combination of controls to the extent feasible, and supplement such protections using PPE, where necessary, including respirators for potentially exposed persons at risk of inhalation exposure above the interim ECEL. If efforts of elimination, substitution, engineering controls, and administrative controls are not sufficient to reduce exposures to or below the interim ECEL for all potentially exposed persons in the workplace, EPA requires that the

owner or operator use feasible controls to reduce TCE concentrations in the workplace to the lowest levels achievable and supplement these controls with respiratory protection and PPE as needed to achieve the interim ECEL before potentially exposed persons enter a regulated area. During the phase-out period, EPA encourages investment in elimination and substitution along with the use of readily available engineering controls. In cases where respiratory PPE is necessary to supplement feasible controls, EPA requires that the owner or operator provide potentially exposed persons reasonably likely to be exposed to TCE by inhalation to concentrations above the interim ECEL with respirators affording sufficient protection against inhalation risk and appropriate training on the proper use of such respirators, to ensure that their exposures do not exceed the interim ECEL, as described in this Unit. Furthermore, EPA also requires that the owner or operator document their efforts in using elimination, substitution, engineering controls, and administrative controls to reduce exposure to or below the interim ECEL in an exposure control plan.

EPA is finalizing its requirement that, no later than December 18, 2025, the owner or operator include and document in the exposure control plan or through any existing documentation of the facility's safety and health program developed as part of meeting OSHA requirements or other safety and health standards, the following:

- Identification in the exposure control plan of available exposure controls and rationale for using or not using available exposure controls in the following sequence (*i.e.*, elimination and substitution, then engineering controls and administrative controls) to reduce exposures in the workplace to either at or below the interim ECEL or to the lowest level achievable, and the exposure controls selected based on feasibility, effectiveness, and other relevant considerations;
- For each exposure control considered, exposure controls selected based on feasibility, effectiveness, and other relevant considerations;
- A description of actions the owner or operator must take to implement exposure controls selected, including proper installation, regular inspections, maintenance, training, or other steps taken;
- A description of each regulated area, how they are demarcated, and persons authorized to enter the regulated areas;
- A description of activities conducted by the owner or operator to review and update the exposure control plan to ensure effectiveness of the exposure controls, identify any necessary updates to the exposure controls, and confirm that all persons are properly implementing the exposure controls; and
- An explanation of the procedures for responding to any change that may reasonably be expected to introduce additional sources of exposure to TCE, or otherwise result in increased exposure to TCE, including procedures for implementing corrective actions to mitigate exposure to TCE.

Under this final rule, owners or operators are prohibited from using rotating work schedules to comply with the interim ECEL 8-hour TWA, in alignment with certain elements of existing OSHA's standards for toxic and hazardous substances under 29 CFR part 1910, subpart Z. Owners or operators must maintain the effectiveness of any engineering controls, administrative controls, or work practices instituted as part of the exposure control plan. They must also review and update the exposure control plan as necessary, but at least every five years, to reflect any significant changes in the status of the owner or operator's approach to compliance with the exposure control requirements. EPA intends that the exposure control plan identify the *available* exposure controls and, for the exposure controls not selected, document the efforts identifying why these are not feasible, not effective, or otherwise not implemented. For entities for which significant amounts of time are needed to verify suitability of alternatives or procure funds or authorization for additional engineering controls, for example, EPA expects that as those controls become available the exposure control plan would be updated accordingly. EPA requires that the exposure control plan be revisited under certain conditions and encourages updates as more sophisticated controls are available.

This final rule requires owners or operators to make the exposure control plan and associated records, including interim ECEL exposure monitoring records, interim ECEL compliance records, and workplace participation records, available to potentially exposed persons and their designated representatives. Owners or operators must notify potentially exposed persons and their designated representatives of the availability of the exposure control plan and associated records within 30 days of the date that the exposure control plan is completed and at least annually thereafter. The notice of the availability of the plan and associated records must be provided in plain language writing to each potentially exposed person in a language that the person understands or posted in an appropriate and accessible location outside the regulated area with an English-language version and a non-English version representing the language of the largest group of workers who do not read English. This final rule also requires the owner or operator to provide the exposure control plan and associated records at a reasonable time, place, and manner to a potentially exposed person or their designated representative upon request. As explained in Unit III.A.4., if the owner or operator is unable to provide the specified records within 15 working days, the owner or operator must inform the potentially exposed person or designated representative requesting the record within 15 working days that reason for the delay and the earliest date when the record can be made available.

7. Personal Protective Equipment (PPE)

Where elimination, substitution, engineering, and administrative controls are not feasible or sufficiently protective to reduce the air concentration to or below the interim ECEL, EPA is finalizing as proposed, with slight modifications to improve clarity or for greater consistency with OSHA's regulations, to require owners and operators to provide PPE, including respiratory protection and dermal protection selected in accordance with the guidelines described in Units IV.C.7.a. and b. and to implement a PPE program described in this Unit. This Unit includes a description of the PPE Program, including required PPE as it relates to respiratory protection, required PPE as it relates to dermal protection, and other requirements such as additional training for respirators and recordkeeping to support implementation of a PPE program. Compliance with these requirements must occur no later than September 15, 2025, or, for requirements related to respiratory protection, within 90 days after the receipt of any exposure monitoring that indicates exposures exceeding the interim ECEL.

a. Respiratory Protection

Where elimination, substitution, engineering, and administrative controls are not feasible or sufficiently protective to reduce the air concentration to or below the interim ECEL, or if inhalation exposure above the interim ECEL is still reasonably likely, EPA is finalizing, with slight modification from the proposed rule, minimum respiratory PPE requirements based on an owner or

operator's most recent measured air concentration for one or more potentially exposed persons and the level of PPE needed to reduce exposure to or below the interim ECEL. In those circumstances, EPA is finalizing requirements for a respiratory protection PPE program with worksite-specific procedures and elements for required respirator use. Owners or operators must develop and administer a written respiratory protection program in accordance with OSHA's respiratory protection standard under 29 CFR 1910.134(c)(1), (c)(3), and (c)(4). EPA is finalizing requirements that owners and operators provide training to all persons required to use respiratory protection consistent with 29 CFR 1910.134(k) prior to or at the time of initial assignment to a job involving potential exposure to TCE. Owners and operators must retrain all persons required to use PPE at least annually, or whenever the owner or operator has reason to believe that a previously trained person does not have the required understanding and skill to properly use PPE, or when changes in the workplace or in PPE to be used render the previous training obsolete.

EPA is finalizing requirements that each owner or operator supply a respirator, selected in accordance with this Unit, to each person who enters a regulated area after September 15, 2025, or within 90 days after the receipt of any exposure monitoring that indicates exposures exceeding the interim ECEL, and thereafter must ensure that all persons within the regulated area are using the provided respirators whenever TCE exposures exceed or can reasonably be expected to exceed the interim ECEL.

EPA is also finalizing requirements that owners or operators who are required to administer a respiratory protection PPE program must supply a respirator selected based on a medical evaluation consistent with the requirements of 29 CFR 1910.134(e). If a potentially exposed person cannot use a negative-pressure respirator, then the owner or operator must provide that person with an alternative respirator. The alternative respirator must have less breathing resistance than the negative-pressure respirator and provide equivalent or greater protection. If the person is unable to use an alternative respirator, then the person must not be permitted to enter the regulated area. Additionally, EPA is requiring owners and operators to select respiratory protection that properly fits each affected person and communicate respirator selections to each affected person in accordance with the requirements of 29 CFR 1910.134(f). Consistent with requirements of 29 CFR 1910.134(g) through (j), EPA is requiring owners and operators to provide, ensure use of, and maintain (in a sanitary, reliable, and undamaged condition), respiratory protection that is of safe design and construction.

EPA is finalizing the requirements to establish minimum respiratory protection requirements, such that any respirator affording a higher degree of protection than the following requirements may be used. In instances where respiratory protection is appropriate, NIOSH Approved® equipment must be used. NIOSH Approved is a certification mark of the U.S. Department of Health and Human Services (HHS) registered in the United States and several international jurisdictions. EPA is finalizing the following requirements for respiratory protection, based on the most recent exposure monitoring concentrations results measured as an 8-hour TWA that exceed the interim ECEL (0.2 ppm):

- If the measured exposure concentration is at or below 0.2 ppm: no respiratory protection is required.
- If the measured exposure concentration is above 0.2 ppm and less than or equal to 2 ppm (10 times interim ECEL): Any NIOSH Approved air-purifying half mask respirator equipped with organic vapor cartridges or canisters; or any NIOSH Approved Supplied-Air Respirator (SAR) or Airline Respirator operated in demand mode equipped with a half mask; or any NIOSH Approved Self-Contained Breathing Apparatus (SCBA) in a demand mode equipped with a half mask [APF 10].
- If the measured exposure concentration is above 2 ppm and less than or equal to 5 ppm (25 times interim ECEL): Any NIOSH Approved Powered Air-Purifying Respirator (PAPR) equipped with a loose-fitting facepiece or hood/helmet equipped with organic vapor cartridges or canisters; or any NIOSH Approved SAR or Airline Respirator in a continuous-flow mode equipped with a loose-fitting facepiece or helmet/hood [APF 25].
- If the measured exposure concentration is above 5 ppm and less than or equal to 10 ppm (50 times interim ECEL): Any NIOSH Approved air-purifying full facepiece respirator equipped with organic vapor cartridges or canisters; any NIOSH Approved PAPR with a half mask equipped with organic vapor cartridges or canisters; any NIOSH Approved SAR or Airline Respirator in a continuous flow mode equipped with a half mask; any NIOSH Approved SAR or Airline Respirator operated in a pressure-demand or other positive-pressure mode with a half mask; or any NIOSH Approved SCBA in demand-mode equipped with a full facepiece or helmet/hood [APF 50].
- If the measured exposure concentration is above 10 ppm and less than or equal to 200 ppm (1,000 times interim ECEL): Any NIOSH Approved PAPR equipped with a full facepiece equipped with organic vapor cartridges or canisters; any NIOSH Approved SAR or Airline Respirator in a continuous-flow mode equipped with full facepiece; any NIOSH Approved SAR or Airline Respirator in pressure-demand or other positive-pressure mode equipped with a full facepiece and an auxiliary self-contained air supply; or any NIOSH Approved SAR or Airline Respirator in a continuous-flow mode equipped with a helmet or hood and has been tested to demonstrate performance at a level of protection of APF 1,000 or greater. [APF 1,000].
- If the measured exposure concentration is greater than 200 ppm (1,000+ times interim ECEL) or the concentration is unknown: Any NIOSH Approved SAR equipped with a full facepiece and operated in a pressure demand or other positive pressure mode in combination with an auxiliary self-contained breathing apparatus operated in a pressure demand or other positive pressure mode [APF 1000+]; or any NIOSH Approved SCBA in a pressure-demand or other positive-pressure mode equipped with a full facepiece or helmet/hood [APF 10,000].
- If the exposure concentration is unknown: Any NIOSH Approved combination supplied air respirator equipped with a full facepiece and operated in pressure demand or other positive pressure mode with an auxiliary self-contained air supply; or any NIOSH Approved SCBA operated in pressure demand or other positive pressure mode and equipped with a full facepiece or hood/helmet [APF 1000+].

Additionally, EPA is finalizing requirements that owners or operators select and provide respirators in accordance with the requirements of 29 CFR 1910.134(d)(1)(iv) and with consideration of workplace and user factors that affect respirator performance and reliability. EPA is requiring that the owner or operator must ensure that all filters, cartridges, and canisters used in the workplace are labeled and color coded per NIOSH requirements and that the label is not removed and remains legible. Consistent with 29 CFR 1910.134(d)(3)(iii), EPA is requiring either the use of NIOSH Approved respirators with an end-of-life service indicator for the contaminant, in this case TCE, or implementation of a

change schedule for canisters and cartridges that ensures that they are changed before the end of their service life. EPA is also requiring owners and operators to ensure that respirators are used in compliance with the terms of the respirator's NIOSH approval.

EPA is finalizing requirements that owners and operators must conduct regular evaluations of the workplace, including consultations with potentially exposed persons using respiratory protection, consistent with the requirements of 29 CFR 1910.134(l), to ensure that the provisions of the written respiratory protection program described in this Unit are being effectively implemented.

EPA is finalizing that owners and operators document respiratory protection used and PPE program implementation. EPA is finalizing requirements that owners and operators document in the exposure control plan or other documentation of the facility's safety and health program information relevant to the respiratory program, including records on the name, workplace address, work shift, job classification, work area, and type of respirator worn (if any) by each potentially exposed person, maintenance, and fit-testing, as described in 29 CFR 1910.134(f), and training in accordance with 29 CFR 1910.132(f) and 29 CFR 1910.134(k).

b. Dermal Protection

This final rule requires owners and operators to provide and require the use of chemically resistant gloves by potentially exposed persons for tasks where TCE is present and dermal exposure can be expected to occur under the conditions of use. Compliance with this requirement must occur no later than September 15, 2025. Owners and operators should also consider other glove factors, such as compatibility of multiple chemicals used simultaneously while wearing TCE-resistant gloves or with glove liners, permeation, degree of dexterity required to perform a task, and temperature, as identified in the Hand Protection section of OSHA's Personal Protection Equipment Guidance (Ref. 89), when selecting appropriate PPE. Owners and operators can select gloves that have been tested in accordance with the American Society for Testing Material F739 "Standard Test Method for Permeation of Liquids and Gases through Protective Clothing Materials under Conditions of Continuous Contact."

Owners and operators must provide dermal PPE that is of safe design and construction for the work to be performed and that properly fits each potentially exposed person who is required to use dermal PPE. Owners and operators must also communicate dermal PPE selections to each affected person and ensure that each potentially exposed person who is required by this unit to wear PPE uses and maintains PPE in a sanitary, reliable, and undamaged condition. Activity-specific training (*e.g.*, glove selection (type, material), expected duration of glove effectiveness, actions to take when glove integrity is compromised, storage requirements, procedure for glove removal and disposal, chemical hazards) must be provided in accordance with 29 CFR 1910.132(f).

8. Additional Finalized Requirements

a. Workplace Information and Training

EPA is also finalizing its requirements to implement a training program in alignment with the OSHA Hazard Communication Standard (29 CFR 1910.1200) and chemical-specific standards, such as the OSHA General Industry Standard for Methylene Chloride (29 CFR 1910.1052). To ensure that potentially exposed persons in the workplace are informed of the hazards associated with TCE exposure, EPA is finalizing as proposed with slight modification to require that owners or operators of workplaces subject to the WCPP institute a training and information program by September 15, 2025 for potentially exposed persons and assure their participation in the program. For purposes of workplace information and training, owners and operators are only required to train potentially exposed persons that are expected to be present in the regulated area or to directly handle TCE or handle equipment or materials on which TCE may present.

As part of the training requirement, the owner or operator is required to provide information and comprehensive training in an understandable manner (*i.e.*, plain language), considering factors such as the skills required to perform the work activity and the existing skill level of the staff performing the work, and in multiple languages as appropriate (*e.g.*, based on languages spoken by potentially exposed persons) to potentially exposed persons. This training and information must be provided prior to or at the time of initial assignment to a job involving potential exposure to TCE. Owners and operators are required to provide information and training, as referenced in the OSHA Hazard Communication Standard, to all potentially exposed persons that includes:

- The requirements of the TCE WCPP and how to access or obtain a copy of the requirements of the WCPP, including but not limited to the exposure control plan, monitoring requirements, and PPE program;
- The quantity, location, manner of use, release, and storage of TCE and the specific operations in the workplace that could result in TCE exposure, particularly noting where each regulated area is located;
- Principles of safe use and handling of TCE in the workplace, including specific measures the owner or operator has implemented to reduce inhalation exposure at or below the interim ECEL or prevent dermal contact with TCE, such as work practices and PPE used;
- The methods and observations that may be used to detect the presence or release of TCE in the workplace (such as monitoring conducted by the owner or operator, continuous monitoring devices, visual appearance, or odor of TCE when being released, etc.); and
- The acute and chronic health hazards of TCE as detailed on relevant SDSs.

In addition to providing training at the time of initial assignment to a job involving potential exposure to TCE, owners and operators subject to the TCE WCPP are required to re-train each potentially exposed person annually to ensure they understand the principles of safe use and handling of TCE in the workplace. EPA is finalizing its requirements that owners and update the training as necessary whenever there are changes in the workplace, such as new tasks or modifications of tasks, in particular, whenever there are changes in the workplace that increase exposure to TCE or where potentially exposed persons' exposure to TCE can reasonably be expected to exceed the action level or increase the potential for direct dermal contact with TCE. To support compliance, EPA is finalizing as proposed that each owner or operator of a workplace subject to the WCPP is required to provide to the EPA, upon request, all available materials related to workplace information and training.

b. Workplace Participation

EPA encourages owners and operators to consult with potentially exposed persons and their designated representatives on the development and implementation of exposure control plans and PPE/respirator programs. EPA is finalizing the requirement that owners and operators provide potentially exposed persons and their designated representatives regular access to the exposure control plans, exposure monitoring records, and PPE

program implementation. To ensure compliance with workplace participation, EPA is finalizing its requirement that the owner or operator document the notice to and ability of any potentially exposed person who may reasonably be affected by TCE exposure to readily access the exposure control plans, facility exposure monitoring records, PPE program implementation, or any other information relevant to TCE exposure in the workplace.

c. Notification of Monitoring Results

EPA is finalizing the requirement that the owner or operator must, within 15 working days after receipt of the results of any exposure monitoring, notify each person whose exposures are monitored or who is part of a monitored exposure group and their designated representatives in writing, in plain language, either individually to each potentially exposed person or by posting the information in an appropriate and accessible location, such as public spaces or common areas, for potentially exposed persons outside of the regulated area. The notice is required to identify the exposure monitoring results, the interim ECEL and interim ECEL action level, statement of whether the monitored airborne concentration of TCE exceeds the interim ECEL and the interim ECEL action level, and any corresponding respiratory protection required. If the interim ECEL is exceeded, the notice must also include a description of the actions taken by the owner or operator to reduce inhalation exposures to or below the interim ECEL. The notice must also include the quantity, location, and manner of TCE use at the time of monitoring. The notice must also include identified releases of TCE. The notice must be provided in multiple languages if necessary. Specifically, notice must be provided in a language that each potentially exposed person understands, or posted in a non-English language version representing the language of the largest group of workers who cannot readily comprehend or read English).

d. Recordkeeping

For owners and operators to demonstrate compliance with the WCPP provisions, EPA is requiring that owners and operators must retain compliance records for five years (although this requirement does not supplant any longer recordkeeping retention time periods such as those required under 29 CFR 1910.1020, or other applicable regulations). EPA is requiring the owner or operator to retain records of:

- Exposure control plan;
- Regulated areas and authorized personnel;
- Facility exposure monitoring records;
- Notifications of exposure monitoring results;
- PPE and respiratory protection used and program implementation; and
- Information and training provided by the owner or operator to each potentially exposed person prior to or at the time of initial assignment to a job involving potential exposure to TCE.

EPA emphasizes that all records required to be maintained can be kept in the most administratively convenient form: electronic record form or paper form. The owner or operator is required to document training or re-training of any potentially exposed person as necessary to ensure that, in the event of monitoring results that indicate exposure or possible exposures above the interim ECEL action level, the potentially exposed person has demonstrated understanding of how to use and handle TCE and how to appropriately use required PPE.

D. Prescriptive Controls for Energized Electrical Cleaner

In contrast to the non-prescriptive requirements of the WCPP, where regulated entities would have flexibility to select controls in accordance with the hierarchy of controls to comply with the parameters outlined in Unit IV.C., EPA has found it appropriate for certain activities in certain circumstances to allow owners and operators the choice of either complying with the WCPP or require complying with specific prescriptive controls for certain occupational conditions of use. EPA is finalizing specific prescriptive controls for the industrial and commercial use of TCE in energized electrical cleaner. The rationale for these changes, after consideration of public comments, is in Unit III.C.1. This Unit provides a description of the condition of use subject to specific prescriptive controls, the specific prescriptive control requirements, and the compliance timeframes for the requirements.

Considering the time needed to transition away from this use of TCE, to protect health from inhalation and dermal exposures to TCE from the industrial and commercial use of TCE-containing energized electrical cleaners, which is a sub-use of the industrial and commercial use as an aerosol spray degreaser/cleaner, EPA is requiring owners and operators to comply with either (i) specific prescriptive controls outlined in this Unit, including dermal PPE and respiratory protection, or (ii) implementation of the WCPP outlined in Unit IV.C. As described in Unit III.C.1., EPA's workplace requirements to reduce exposures to TCE in the timeframe before prohibitions for energized electrical cleaner are consistent to the extent possible with existing regulations and best practices for work in electrical spaces. EPA acknowledges the existing OSHA requirements for electrical protective equipment under 29 CFR 1910.137 and determined the requirements in this Unit do not interfere with a potentially exposed person's ability to safely use electrical protective equipment, such as rubber insulating gloves and rubber insulating sleeves, as required under OSHA.

1. Applicability

The industrial and commercial use of TCE in energized electrical cleaner refers to the use of TCE in a product to clean and/or degrease electrical equipment, where cleaning and/or degreasing is accomplished when electrical current exists, or when there is a residual electrical potential from a component, such as a capacitor (*i.e.*, energized equipment use only). In this final rule, energized electrical cleaner does not include general purpose degreaser, electrical cleaner, or electronic cleaner, for example for use in motorized vehicle maintenance and their parts, which is subject to the prohibitions described in Unit IV.B.1.

2. Workplace Requirements for Energized Electrical Cleaner

EPA is requiring that owners or operators must either implement (i) specific prescriptive controls that provide dermal PPE and respiratory protection or (ii) implement the WCPP for industrial and commercial use in energized electrical cleaner. Owners and operators must maintain a statement regarding whether the business is complying with the specified prescriptive controls or with the WCPP.

a. Prescriptive Controls

i. Dermal Protection

This rule requires dermal PPE, including impermeable gloves, in combination with comprehensive training for each potentially exposed person who uses TCE in energized electrical cleaner. For dermal PPE, EPA is requiring that each owner or operator comply with the requirements outlined in Unit IV.C.7.b. for selection of dermal PPE and training for all potentially exposed persons.

ii. Respiratory Protection

This final rule requires the use of specific respiratory protection, in combination with comprehensive training, for use of energized electrical cleaner containing TCE. Specifically, EPA is requiring owners or operators to provide to potentially exposed persons, and potentially exposed persons to use, the following: any NIOSH Approved air-purifying full facepiece respirator equipped with organic vapor cartridges or canisters; any NIOSH Approved PAPR with a half mask equipped with organic vapor cartridges or canisters; any NIOSH Approved SAR or Airline Respirator in a continuous flow mode equipped with a half mask; any NIOSH Approved SAR or Airline Respirator operated in a pressure-demand or other positive-pressure mode with a half mask; or any NIOSH Approved SCBA in demand-mode equipped with a full facepiece or helmet/hood [APF 50]; or any NIOSH Approved respirator affording a higher degree of protection. In providing the specified respirators and training, EPA is requiring owners or operators to administer a PPE program with procedures and elements for required respirator use as described in Unit IV.C.7.a., for proper use, maintenance, fit-testing, medical evaluation, and training. EPA is requiring that the owner or operator must ensure that all filters, cartridges, and canisters used in the workplace are labeled and color coded per NIOSH requirements and that the label is not removed and remains legible.

b. WCPP

EPA understands that there may be instances where a performance-based standard is more appropriate to reduce exposures from the industrial and commercial use of TCE in energized electrical cleaner, instead of the specific prescriptive dermal and respiratory protection requirements described in this Unit. For example, the WCPP may be preferred by owners or operators that regularly use TCE to clean energized electrical equipment onsite at their facility or by owners or operators that are implementing the WCPP at their facility for another condition of use of TCE. In these instances, the final rule permits owners or operators to comply with the WCPP requirements, including the interim ECEL, direct dermal contact controls, and ancillary provisions, outlined in Unit IV.B, instead of the prescriptive controls described in this Unit.

c. Recordkeeping

Owners and operators subject to the energized electrical cleaner requirements must maintain a statement regarding whether the owner or operator is complying with the prescriptive control requirements or the WCPP requirements. They must also maintain records of the dermal and respiratory protection used by each potentially exposed person and of PPE program implementation or the WCPP records described in Unit IV.C.8.d.

Distributors of TCE, including TCE containing products, for use in energized electrical cleaner must retain sale records, including the name of the purchaser, sale date, and quantity sold.

E. Wastewater Worker Protection Provisions

1. Applicability

The disposal of TCE to wastewater refers to the disposal of TCE to industrial pre-treatment, industrial treatment, or publicly owned treatment works, which includes the mixing of TCE with wastewater and the discharge of TCE-contaminated wastewater pursuant to a NPDES permit. EPA is finalizing distinct workplace protection provisions, separate from the WCPP described in Unit IV.C., for owners and operators of facilities or sites involved in the industrial treatment and pre-treatment of TCE wastewater at cleanup sites, that fall under the 50-year TSCA section 6(g) exemption for disposal of TCE for the purposes of facilitating cleanup projects of TCE-contaminated groundwater and other wastewater. EPA is also finalizing distinct workplace protection provisions for owners and operators of publicly owned treatment works who receive wastewater associated with TCE disposal for: industrial and commercial use as a processing aid for lithium battery separator manufacturing, industrial and commercial use of TCE as a processing aid for lead-acid battery separator manufacturing, industrial and commercial use of TCE as a processing aid for specialty polymeric microporous sheet material manufacturing, and facilitating cleanup projects of TCE-contaminated groundwater and other wastewater. Owners and operators of facilities or sites involved in the industrial treatment and pre-treatment sub-categories of TCE wastewater disposal for industrial and commercial conditions of use are not included within these distinct wastewater provisions and are subject to the WCPP described in Unit IV.C. For the purposes of this rulemaking, EPA does not consider wastewater to be a product that is eligible for the regulatory threshold discussed in Units III.D.1 and IV.A. As discussed in Unit III.D.1., EPA finds that a regulatory threshold is necessary to avoid impacts on numerous supply chains, particularly chlorinated organic products. These considerations are not applicable to wastewater disposal.

2. Workplace Requirements for Facilitating Cleanup Projects of TCE-Contaminated Groundwater and Other Wastewater

This final rule requires that owners and operators of facilities or sites involved in disposal of TCE-containing wastewater for the purposes of cleanup projects of TCE-contaminated water and groundwater follow the requirements set forth in 29 CFR 1910.120(c)(5) and (h), known as the Hazardous Waste Operations and Emergency Response standard, with notable modifications: this rule requires that, for those provisions in 29 CFR 1910.120 that reference a PEL, owners and operators will instead comply with the TSCA interim ECEL of 0.2ppm. As explained in Unit III.A.2., owners and operators of these cleanup sites must ensure that potentially exposed persons involved with the activity of removing the wastewater from the location where it was found and treating the removed wastewater on-site are protected to the interim ECEL level of 0.2 ppm and protected from dermal contact with TCE-containing wastewater.

3. Workplace Requirements for Workers at Publicly Owned Treatment Works

To protect workers and facilitate successful implementation, EPA is finalizing the requirement that POTWs must either (i) implement the WCPP or (ii) where there is a reasonable possibility of the presence of TCE screen the wastewater they receive, in a manner consistent with the approach outlined in EPA's 1992 "Guidance to Protect POTW Workers from Toxic and Reactive Gases and Vapors" (Ref. 52). Owners and operators must compare the concentration of TCE in wastewater to a screening level that EPA calculated as described in section III.A.2. EPA is finalizing a provision that if the wastewater concentration is equal to or less than 0.00284 mg/L of TCE, the POTW where there is a reasonable possibility of the presence of TCE can assume that the concentration of TCE in air that results from TCE volatilization from wastewater is equal to or less than the interim ECEL. If a POTW's wastewater screening detects TCE at concentration greater than 0.00284 mg/L of TCE then EPA is requiring that owners and operators comply with the

WCPP, as described in Unit IV.C., except that owners and operators do not have to perform initial air monitoring.

F. Other Requirements

1. Recordkeeping

EPA is finalizing as proposed the requirement that manufacturers, processors, industrial and commercial users, and distributors maintain ordinary business records, such as invoices and bills-of-lading, that demonstrate compliance with restrictions and other provisions of this final regulation; and that they maintain such records for a period of five years from the date the record is generated. This requirement begins on February 18, 2025. For enforcement purposes, EPA will have access to such businesses records plus additional records required under 40 CFR 751.323. Recordkeeping requirements ensure that owners or operators can demonstrate compliance with the regulations if necessary.

2. Downstream Notification

EPA is finalizing as proposed the requirements that manufacturers (including importers), processors, and distributors of TCE and TCE-containing products provide downstream notification of certain prohibitions through SDSs by adding the language set forth in § 751.321(c) to sections 1(c) and 15 of the SDS. To provide adequate time to update the SDS and ensure that all products in the supply chain include the revised SDS, EPA's final rule requires manufacturers revise their SDS within 60 days of publication and processors and distributors revise their SDS within 180 days of publication of the final rule.

The intention of downstream notification is to spread awareness throughout the supply chain of the restrictions on TCE under TSCA and to provide information to commercial end-users about the timeframes for use until prohibition.

G. TSCA Section 6(g) Exemptions

Under TSCA section 6(g)(1), EPA may grant an exemption from a requirement of a TSCA section 6(a) rule for a specific condition of use of a chemical substance or mixture if the Agency makes one of three findings. TSCA section 6(g)(1)(A) permits such an exemption if the specific condition of use is a critical or essential use for which no technically and economically feasible safer alternative is available. Under TSCA section 6(g)(1)(B), EPA must find that compliance with the requirement would significantly disrupt the national economy, national security, or critical infrastructure to provide an exemption. Finally, TSCA section 6(g)(1)(C) allows for an exemption based on an EPA finding that the specific condition of use of the chemical substance or mixture, as compared to reasonably available alternatives, provides a substantial benefit to health, the environment, or public safety. This unit presents the TSCA section 6(g) exemptions EPA is finalizing in this rule. See Units V.A.3. and V.B.3. of the 2023 TCE proposed rule for an analysis of the need for such exemptions pursuant to TSCA section 6(g)(2). EPA notes that EPA is able to extend or modify TSCA section 6(g) exemptions by rulemaking as appropriate but is unable to incorporate automatic extensions to TSCA section 6(g) exemptions. Given the nature of Agency rulemaking, EPA notes that such requests to extend or modify a TSCA section 6(g) exemption be submitted to EPA several years in advance of the expiration of the exemption.

Unless otherwise specified, for each condition of use subject to a time-limited TSCA section 6(g) exemption in this final rule, EPA is requiring owners and operators of the location where such use occurs to comply with the WCPP provisions described in Unit IV.C. and the recordkeeping provisions described in Unit IV.F. Additionally, for each condition of use subject to a time-limited TSCA section 6(g) exemption, EPA is requiring manufacturers (including importers) and processors of TCE for such use to comply with the WCPP provisions described in Unit IV.C. until the prohibition compliance date. The prohibition compliance date for the manufacture (including import), processing, and distribution in commerce for each condition of use subject to a time-limited TSCA section 6(g) exemption, except for disposal, is the same as the expiration date of the exemption for that use.

1. 7-Year Exemption for Industrial and Commercial Use of TCE in Closed-Loop and Open-Top Batch Vapor Degreasing for Essential Aerospace Parts and Components and Narrow Tubing Used in Medical Devices

EPA is finalizing a seven-year TSCA section 6(g)(1)(B) exemption from the prohibition for the industrial and commercial use of TCE in batch vapor degreasing for essential aerospace parts and components and a seven-year TSCA section 6(g)(1)(A) exemption from the prohibition for the industrial and commercial use of TCE in batch vapor degreasing for narrow tubing used in medical devices. As described in Unit V.B.3. in the proposed rule, EPA's primary alternative regulatory action described 7-year TSCA section 6(g) exemptions from prohibition for industrial and commercial use of TCE in batch vapor degreasing for essential aerospace parts and components and narrow tubing used in medical devices. EPA is finalizing these exemptions. The specific condition for these exemptions is that TCE can only be used for batch vapor degreasing of: (1) essential aerospace parts and components (including rayon fabric) where cleaning alternatives present technical feasibility or performance challenges to meet specifications from other Federal agencies or other long-standing design specifications that are included in existing contracts, or (2) narrow tubing for medical devices.

2. 7-Year Exemption for Industrial and Commercial Use of TCE as a Solvent in Closed-Loop Batch Vapor Degreasing Necessary for Rocket Engine Cleaning by Federal Agencies and Their Contractors

EPA is finalizing as proposed a 7-year TSCA section 6(g)(1)(B) exemption from the prohibition on the industrial and commercial use of TCE as a solvent in closed-loop vapor degreasing necessary for rocket engine cleaning by Federal agencies and their contractors, and the manufacture (including import), processing, and distribution in commerce of TCE for this use.

3. 10-Year Exemption for TCE for Certain Industrial and Commercial Uses for Vessels of the Armed Forces and Their Systems

EPA is finalizing a 10-year TSCA section 6(g)(1)(B) exemption from the prohibition on industrial and commercial use of TCE for the industrial and commercial use of TCE for vessels of the Armed Forces and their systems, and in the maintenance, fabrication, and sustainment for and of such vessels and systems: as potting compounds for naval electronic systems and equipment; sealing compounds for high and ultra-high vacuum systems; bonding compounds for materials testing and maintenance of underwater systems and bonding of nonmetallic materials; and cleaning agents to satisfy cleaning requirements (which includes degreasing using wipes, sprays, solvents, and vapor degreasing) for: materials and components required for military ordinance testing; temporary resin repairs in vessel spaces where welding is not authorized; ensuring polyurethane adhesion for electronic systems and equipment repair and installation of elastomeric materials; various naval combat systems, radars,

sensors, equipment; fabrication and prototyping processes to remove coolant and other residue from machine parts; machined part fabrications for naval systems; installation of topside rubber tile material aboard vessels; and vapor degreasing required for substrate surface preparation prior to electroplating processes. EPA is finalizing this TSCA section 6(g)(1)(B) exemption as proposed, with the modification of the term "DoD naval vessels" to "vessels of the Armed Forces" to make it clear that Coast Guard vessels are included in this exemption because they serve similar national security interests.

4. 10-Year Exemption for the Emergency Use of TCE in Furtherance of NASA's Mission

For the reasons discussed in Unit V.A.3.a.vi. of the proposed rule, EPA is finalizing as proposed a 10-year TSCA section 6(g)(1)(A) exemption for emergency use of TCE in furtherance of NASA's mission for the following specific conditions of use:

(1) Industrial and commercial use as solvent for open-top or closed-loop batch vapor degreasing;

(2) Industrial and commercial use as a solvent for cold cleaning;

(3) Industrial and commercial use as a solvent for aerosol spray degreaser/cleaner and mold release;

(4) Industrial and commercial use as a lubricant and grease in tap and die fluid;

(5) Industrial and commercial use as a lubricant and grease in penetrating lubricant;

(6) Industrial and commercial use as an adhesive and sealant in solvent-based adhesives and sealants;

(7) Industrial and commercial use as a functional fluid in heat exchange fluid;

(8) Industrial and commercial use in corrosion inhibitors and anti-scaling agents;

(9) Industrial and commercial use of TCE as a processing aid; and

(10) Manufacturing (including importing) and processing of TCE for the industrial and commercial uses listed in (1) through (9).

EPA is also finalizing as proposed the inclusion of additional requirements as part of the exemption, pursuant to TSCA section 6(g)(4), including required notification and controls for exposure, to the extent feasible: (1) NASA and its contractors must provide notice to the EPA Administrator of each instance of emergency use within 15 days; and (2) NASA and its contractors would have to comply with the WCPP to the extent feasible.

EPA is finalizing to require that NASA notify EPA within 15 days of the emergency use. The notification would include a description of the specific use of TCE in the context of one of the conditions of use for which this exemption is being finalized, an explanation of why the use described qualifies as an emergency, and an explanation with regard to the lack of availability of technically and economically feasible alternatives. EPA notes that in the event that sensitive information relating to national security or critical infrastructure is submitted to EPA, the Agency will protect such information in accordance with applicable authorities.

EPA expects NASA and its contractors have the ability to implement a WCPP as described in Unit IV.C. for the identified uses in the context of an emergency. Therefore, EPA is finalizing the requirement that during emergency use, NASA and its contractors must comply with the WCPP to the extent technically feasible in light of the particular emergency.

Under the finalized exemption, NASA and its contractors will still be subject to the general recordkeeping requirements discussed in Unit IV.F.

5. 20-Year Exemption for Industrial and Commercial Use of TCE as a Processing Aid for Lead-Acid Battery Separator Manufacturing

EPA is finalizing a 20-year TSCA section 6(g)(1)(B) exemption from the prohibition on the industrial and commercial use of TCE as a processing aid, specific to battery separator manufacturing for lead-acid batteries. The conditions for the exemption are: (1) The use of TCE is limited to use as a processing aid for lead-acid battery separator manufacturing; and (2) This specific industrial and commercial use of TCE as a processing aid is required to be conducted at industrial facilities using TCE to manufacture lead acid battery separators prior to February 18, 2025.

6. 15-Year Exemption for Industrial and Commercial Use of TCE as a Processing Aid for Specialty Polymeric Microporous Sheet Materials

EPA is finalizing a 15-year TSCA section 6(g)(1)(A) exemption from the prohibition on TCE for the industrial and commercial use of TCE as a processing aid for specialty polymeric microporous sheet material manufacturing. As described in more detail in Unit III.B.2., while EPA proposed to prohibit industrial and commercial use of TCE as a processing aid for specialty polymeric microporous sheet materials, EPA's primary alternative regulatory action described a 15-year TSCA section 6(g) exemption from prohibition for this use. EPA received substantiative information in public comments to support the finalization of this exemption, as well as support for 15 years as the appropriate timeframe for this exemption.

The conditions for the exemption are: (1) The use of TCE is limited to use as a processing aid for the manufacturing of specialty polymeric microporous sheet materials; (2) This specific industrial and commercial use of TCE as a processing aid can only be used at industrial facilities in which TCE is already in use to manufacture specialty polymeric microporous sheet materials prior to February 18, 2025.

7. 50-Year Exemption for Laboratory Use of TCE for Essential Laboratory Uses

EPA is finalizing a 50-year TSCA section 6(g)(1)(A) exemption from the prohibition on industrial and commercial use of TCE, for industrial and commercial use of TCE in laboratory use for essential laboratory activities, excluding the testing of asphalt which is subject to a ten-year phase-out as described in Units III.C.3. and IV.B.5. The conditions for the exemption are: (1) The use of TCE is limited to use in an industrial or commercial laboratory for essential laboratory activities, including chemical analysis, chemical synthesis, extracting and purifying other chemicals, dissolving other substances, and research and development for the advancement of cleanup activities, and analytical methods for monitoring related to TCE contamination or exposure monitoring, with the exclusion of laboratory testing for asphalt; and (2) Federal agencies and their contractors are permitted to conduct research and development activities, test and evaluation method activities, and similar laboratory activities, provided the use is essential to the agency's mission.

8. 50-Year Exemption for Disposal of TCE to Industrial Pre-Treatment, Industrial Treatment, or Publicly Owned Treatment Works, for the Purposes of Facilitating Cleanup Projects of TCE-Contaminated Water and Groundwater

EPA is finalizing a 50-year TSCA section 6(g)(1)(A) exemption from the prohibition on disposal of TCE to industrial pre-treatment, industrial treatment, or publicly owned treatment works for the purposes of cleanup projects of TCE-contaminated water and

groundwater. The conditions for the exemption are: (1) The disposal of TCE to industrial pre-treatment, industrial treatment, or publicly owned treatment works must only be for the purposes of cleanup projects of TCE-contaminated water and groundwater and is limited to sites undergoing cleanup under CERCLA, RCRA, or other Federal, state, and local government laws, regulations or requirements; and (2) Owners and operators of the cleanup site locations where TCE industrial treatment or pretreatment occurs are required to comply with the wastewater workplace protection requirements described in Unit IV.E.2., and owners and operators of publicly owned treatment works that receive TCE wastewater, are required to comply with the workplace protection requirements described in Unit IV.E.3. Owners and operators of either type of location must comply with the recordkeeping requirements described in Unit IV.F.1. until the expiration of the exemption and the prohibition compliance date. EPA notes that a remediation method would need to be considered one of the previous types of disposal to fall within the condition of use, and if not would be out of scope of this TSCA rule and not subject to the prohibition or other requirements of the rule.

V. TSCA Section 6(c)(2) Considerations

A. Health Effects and the Magnitude of Human Exposure

EPA's analysis of the health effects of TCE and the magnitude of human exposure to TCE are in the 2020 Risk Evaluation for TCE and the 2023 Revised Risk Determination for TCE (Refs. 1, 2). A summary is presented here.

As described in Unit IV. of the 2023 TCE proposed rule, TCE has a large database of human health toxicity data. The 2020 Risk Evaluation for TCE identified several endpoints, such as kidney toxicity, immunotoxicity, or developmental toxicity, and often a single endpoint was examined by multiple studies. For acute exposures, EPA identified non-cancer effects (developmental toxicity and immunosuppression). For chronic exposures, EPA identified non-cancer effects (liver toxicity, kidney toxicity, neurotoxicity, autoimmunity, reproductive toxicity, and developmental toxicity) as well as cancer (liver, kidney, and non-Hodgkin's lymphoma), with kidney cancer identified as acting through a mutagenic mode of action (Ref. 1). The 2020 Risk Evaluation for TCE contains quantitative risk estimates using several points of departure (PODs), including immunotoxicity endpoints as well as the more sensitive developmental toxicity endpoints, specifically fetal cardiac defects, and both demonstrate that TCE presents risk.

Additionally, in developing the 2020 Risk Evaluation for TCE, EPA analyzed the reasonably available information to ascertain whether some human subpopulations may have greater exposure or greater susceptibility than the general population to the hazard posed by the chemical substance. Factors affecting susceptibility examined in the reasonably available studies on TCE include lifestage, sex, genetic polymorphisms, race/ethnicity, preexisting health status, lifestyle factors, and nutrition status. Groups of individuals for which one or several of these factors apply may be considered PESS (Ref. 1).

Because TSCA section 6(c)(2)(B) directs EPA to factor in, to the extent practicable, the health effects of TCE under TSCA section 6(c)(2)(A) when selecting among options, TSCA section 6(c) thereby provides EPA with the flexibility to tailor the regulatory restrictions to account for particular health effects identified in the underlying risk evaluation. With this consideration, EPA found that, in some cases, a regulatory option that could reduce exposures such that they would achieve the benchmark margin of exposure for the most sensitive non-cancer endpoint (developmental toxicity) would address any risk for other non-cancer endpoints. Older pregnant workers and ONUs, who may be especially susceptible to TCE-induced cardiac defects in their developing fetus, are classified as a PESS, and the associated POD and risk estimates were included in the 2020 Risk Evaluation in consideration of PESS groups. EPA has carefully considered the health effects of TCE on pregnant workers and ONUs as part of the Agency's requirements and prohibitions. In order for this rulemaking to appropriately address risk to all workers and ONUs exposed to TCE through occupational conditions of use, EPA has factored in consideration of additional health effects applicable to PESS, including older pregnant workers and ONUs (the group identified as most susceptible to fetal cardiac defects) pursuant to TSCA section 6(c)(2).

In the risk characterization section of the 2020 Risk Evaluation for TCE, EPA acknowledged that fetal cardiac defects are an acute, non-cancer endpoint of concern, particularly for older pregnant women, while also acknowledging uncertainty surrounding the use of this endpoint to inform the determination of whether TCE presents unreasonable risk of injury to health for all affected human populations. In the 2020 Risk Evaluation for TCE, EPA presented the Agency's findings with respect to different endpoints and characterized the immunotoxicity endpoints as the "best overall" non-cancer endpoints for use in the risk conclusions and risk determination. The endpoints were characterized in this way precisely because of the quantitative uncertainties surrounding the use of the fetal cardiac defects endpoint and other considerations. Further, as noted in Unit II.D.1. of the 2023 TCE proposed rule, EPA received numerous comments on EPA's 2020 TSCA Risk Evaluation policy choice regarding endpoint selection that have raised concerns pertaining to political interference and scientific integrity, among other issues. EPA received significant feedback on this aspect of the 2020 Risk Evaluation for TCE, including focused attention on this issue from the SACC and public commenters reacting to the draft Risk Evaluation for TCE (Ref. 90). Moreover, based on the discussion included in the peer review report of the 2020 Risk Evaluation, EPA also concluded that reasonable scientists would not disallow the use of the fetal cardiac defects studies, and that therefore other EPA program reliance on the fetal cardiac defects endpoint is scientifically valid (*e.g.*, Integrated Risk Information System (*https://iris.epa.gov*)).

The 2020 Risk Evaluation for TCE identified the developmental toxicity endpoint of fetal cardiac defects, which presents a lower POD than the immunotoxicity endpoints. The magnitude of the unreasonable risk from exposures to TCE would have been greater had the Agency relied upon the developmental toxicity endpoint (Ref. 1). Specifically, EPA identified the risk of fetal cardiac defects most strongly associated with offspring of older mothers, and therefore included risk estimates for fetal cardiac defects that account for susceptible mothers and their offspring in addition to PESS groups with other susceptibilities (*e.g.*, diabetes, infection status, drug exposure, stress, and metabolic sensitivity due to increased enzymatic activity of cytochrome P450 2E1 (CYP2E1) (Ref. 1).

EPA recognizes that among the non-cancer adverse health effects of TCE, the drivers for EPA's whole chemical unreasonable risk determination for TCE under TSCA were identified as immunotoxicity, namely acute immunosuppression and chronic

autoimmunity from inhalation and dermal exposures (Ref. 2).

Regarding the magnitude of human exposure, one factor EPA considers for the conditions of use that contribute to the unreasonable risk is the size of the exposed population, which, for TCE, EPA estimates is 53,210 workers, 14,659 ONUs, and 20,600 consumers (Ref. 3).

In addition to these estimates of numbers of workers, ONUs, consumers, and bystanders to consumer use directly exposed to TCE, EPA recognizes there is exposure to the general population from air and water pathways for TCE. (While bystanders are individuals in proximity to a consumer use of TCE, fenceline communities are a subset of the general population who may be living in proximity to a facility where TCE is being used in an occupational setting). EPA separately conducted a screening analysis to assess whether there may be risks to the general population from these exposure pathways. This analysis is summarized in full in the 2023 TCE proposed rule, which includes information on the SACC peer review of the methodology. This Unit addresses those areas where some risk was indicated with regard to expected exposures to fenceline communities that are associated with conditions of use for which EPA is finalizing longer compliance timeframes (including under a TSCA section 6(g) time-limited exemption).

EPA's analysis was presented to the SACC peer review panel in March 2022, and EPA is including SACC recommendations, as appropriate, in assessing general population exposures in upcoming risk evaluations. Overall, EPA's fenceline analysis for the air and water pathways for TCE did not allow EPA to rule out unreasonable risk to fenceline communities with confidence. Additionally, based on the fenceline analysis for the ambient air and water pathways for TCE, including the strengths, limitations, and uncertainties associated with the information used to inform the analysis, EPA is unable to determine with this analysis whether those risks drive the unreasonable risk of injury to health presented by TCE. Although EPA did not make a determination of unreasonable risk based on the fenceline screening analysis, this final regulatory action is expected to eliminate the potential risks identified in the screening analysis to any general population or fenceline communities close to facilities engaging in TCE manufacturing, processing, or use.

EPA's fenceline analysis for the water pathway for TCE, based on methods presented to the SACC, found potential risks from several occupational exposure scenarios from exposure to drinking water or incidental dermal or incidental oral exposure to ambient waters. The estimated exposure values for the screening level assessed water pathway resulted in estimated acute noncancer, chronic noncancer, or cancer risk relative to their respective benchmark values for various evaluated occupational exposure scenarios (Ref. 91). As described in more detail in Unit VII.A.2. of the 2023 TCE proposed rule, EPA identified potential risks that exceed the benchmark for non-cancer endpoints for several facilities, representing benchmark exceedances for between 1 and 10 occupational exposure scenarios, depending on whether the drinking water, incidental oral, or incidental dermal exposures are considered. In each case for the screening level analysis, risks were identified only for the maximum risk scenarios (or facilities with the highest reported results), and for a relatively small number of facilities. In instances where a facility may be engaging in a condition of use with a longer phaseout, EPA notes that in no instances did EPA identify drinking water intakes within 10 miles of a discharging facility and emphasizes that the scenarios analyzed include significant uncertainties and assumptions within the high-end risk estimates due to reliance on the highest-reported results from several facilities (Ref. 91). Regarding cancer risks, while the analysis identified facilities with some indication of releases and potential drinking water exposure with associated increased cancer risk that exceeds more than 1 in 1,000,000, the analysis did not identify any facilities with a risk exceeding 1 in 10,000; the highest potential risk estimate is in the 1 in 100,000 range (Ref. 91).

Under the regulatory actions finalized in this rule and described in Unit IV., all conditions of use will ultimately be prohibited and so any potential risk indicated by this screening analysis will be eliminated. The potential risks to fenceline communities from exposure through water further strengthen the impetus for EPA's prohibition of TCE. EPA therefore does not intend to revisit the water pathway for TCE as part of a supplemental risk evaluation.

EPA's fenceline analysis for the air pathway for TCE, using the methodology presented to SACC, and the multi-year analysis conducted in response to SACC feedback indicated potential exposure and associated risks to select populations within the general population at particular facilities (Ref. 92). As described in the 2023 TCE proposed rule, EPA conducted an ambient air analysis to assess non-cancer and cancer risk for real and generic, or modeled, facilities. The three components of the ambient air fenceline analysis were: (1) A single-year ambient air analysis; (2) A multi-year ambient air analysis; and (3) A land use analysis. After doing an initial screen (the single year ambient air screening analysis) that did not rule out unreasonable risk, EPA conducted additional analyses (the multi-year ambient air analysis). The single year ambient air screening analysis and the multi-year ambient air analysis allow EPA to mathematically calculate a cancer risk in fenceline communities. The Agency then conducted a land use analysis as part of both the single-year and multi-year analyses to determine if EPA could reasonably expect an exposure to fenceline communities to occur within the modeled distances for facilities where there was an indication of risk. This review consisted of a visual analysis using aerial imagery and interpreting land/use zoning practices around each facility to identify where residential, industrial/commercial businesses, or other public spaces are present within those radial distances indicating risk (as opposed to uninhabited areas), as well as whether the radial distances lie outside the boundaries of the facility.

There are some uncertainties associated with the fenceline analysis for the air pathway for TCE. The TRI dataset used for the single- and the multi-year fenceline analysis and land use analysis does not include actual release point locations, which can affect the estimated concentrations at varying distances modeled. To identify the release location for each facility, EPA used a local-coordinate system based on latitude/longitude coordinates reported in TRI. The latitude/longitude coordinates may represent the mailing address location of the office building associated with a very large facility or some other area of the facility rather than the actual release location (*e.g.*, a specific process stack). This discrepancy between the coordinates reported in TRI and the actual release point could result in an exposure concentration that does not represent the actual distance where fenceline communities may be exposed. The fenceline analysis also evaluated the most "conservative exposure scenario" that consists of a facility that operates year-round (365 days per year, 24 hours per day, 7 days per week) in a South Coastal meteorologic region and a rural topography setting (Ref. 92). Therefore, the modeled exposures to people who live in fenceline

communities may be overestimated if there are fewer exposure days per year or hours per day.

Additionally, the ambient air fenceline analysis (as well as the water pathway analysis, described in Unit VII.A.2.) organizes facilities and associated risks by Occupational Exposure Scenario (OES) and generally crosswalks each OES with the associated condition of use of TCE (Ref. 92). For some OES, EPA identified the associated conditions of use to the category level in the November 2020 Risk Evaluation for TCE, but, for the air pathway, was unable to identify the conditions of use to the subcategory level due to limited information on activities and use of TCE reported under TRI. Therefore, some OES indicating increased risk from ambient air exposures to TCE in the air fenceline analysis may be associated with one or more conditions of use of TCE. See Unit VII.A.1. of the 2023 TCE proposed rule for additional information on this analysis.

EPA's analysis included inhalation hazard values for cancer and non-cancer risk (acute and chronic immunological and developmental endpoints). Because risk estimates did not exceed the benchmarks for any risks of non-cancer effects, the results presented focus on cancer risks. Standard cancer benchmarks used by EPA and other regulatory agencies are an increased cancer risk above benchmarks ranging from 1 in 1,000,000 (one in a million) to 1 in 10,000 (*i.e.*, 1×10^{-6} to 1×10^{-4}). For example, when setting standards under CAA section 112(f)(2), EPA uses a two-step process, with "an analytical first step to determine an 'acceptable risk' that considers all health information, including risk estimation uncertainty, and includes a presumptive limit on maximum individual risk (MIR) of approximately 1-in-10 thousand" (Ref. 93). In this fenceline analysis for the ambient air pathway for TCE, estimates of risk to fenceline communities were calculated using 1×10^{-6} as the benchmark for cancer risk in fenceline communities. While EPA is unable to determine, based on the screening level fenceline analysis, whether risks to the general population drive the unreasonable risk, as a matter of risk management policy EPA typically considers the range of 1×10^{-6} to 1×10^{-4} as the appropriate benchmark for increased cancer risk for the general population, including fenceline communities. The benchmark value is not a bright line, and the Agency considers a number of factors when determining unreasonable risk, such as the endpoint under consideration, the reversibility of effect, and exposure-related considerations (*e.g.*, duration, magnitude, or frequency of exposure, or population exposed).

The multi-year analysis evaluated 217 facilities and found risk estimates above one in a million for cancer for 133 of those facilities at a distance of 100 meters from the releasing facility. Based on the multi-year analysis, 58 of these 133 facilities either had cancer risks above one in a million at distances farther than 100 meters when compared to the single year analysis or are facilities that were not captured in the single-year analysis. The analysis did not identify any facilities with risk exceeding 1 in 10,000 at a distance greater than 100 meters; the highest risk estimate is in the 1 in 100,000 range (Ref. 92).The land use analysis of the 58 facilities indicating risk in the multi-year fenceline analysis (*i.e.*, facilities where cancer risk estimates were above one in a million at distances farther out when compared to the single-year analysis or facilities that were not captured in the single year analysis) identified a total of 55 facilities with expected exposure to fenceline communities. Those facilities represent 10 occupational exposure scenarios and include: degreasing (open-top batch vapor degreasing; closed-loop batch vapor degreasing; conveyorized vapor degreasing; web vapor degreasing; cold cleaning); formulation of aerosol and non-aerosol products; industrial processing aid; manufacturing; metalworking fluids; other industrial uses; process solvent recycling and worker handling of wastes; processing as a reactant; recycling and disposal; and repackaging (Ref. 92).

Under this regulatory action, each of the conditions of use that indicate risk relative to the one in a million cancer risk benchmark will ultimately be prohibited, many of them within one year. As a result, exposures to any fenceline communities from these facilities will be eliminated under the prohibitions in this rulemaking. The risks to fenceline communities from TCE exposure further strengthens the impetus for EPA's prohibition of TCE. As described earlier in this Unit, EPA notes that TSCA section 6(c)(2) provides for the consideration of health effects in promulgating a rule under TSCA section 6(a).

EPA recognizes that there are some facilities for which the screening analysis estimates that cancer risks are indicated that may exceed one in a million and with expected exposure to fenceline communities. These facilities may be associated with the following conditions of use that EPA is prohibiting under longer compliance timeframes: degreasing (open-top batch vapor degreasing; closed-loop batch vapor degreasing); industrial processing aid; manufacturing; and processing as a reactant. For processing as a reactant, EPA notes that while the analysis identified facilities with some indication of releases and potential exposure with associated increased cancer risk that exceeds one in a million at a distance of 100 meters from the releasing facility, the analysis did not identify any facilities exceeding the 1 in 10,000 benchmark; the highest risk estimate is in the 1 in 100,000 range. For this and other conditions of use that may be associated with facilities that indicate risks with expected exposure to fenceline communities, the rule requires strict workplace exposure controls via implementation of a WCPP as described in Unit IV.C., until the prohibition compliance date.

In the instances where efforts to reduce exposures in the workplace to levels below the interim ECEL could lead to adoption of engineering controls that ventilate more TCE outside, EPA expects that in some situations potential exposure may be limited through facility compliance with existing National Emissions Standards for Hazardous Air Pollutants (NESHAP) that cover TCE or through state-issued air permits that limit TCE emissions. Potentially applicable NESHAP include: 40 CFR part 63, subpart F, Synthetic Organic Chemical Manufacturing Industry; 40 CFR part 63, subpart DD, Off-Site Waste and Recovery Operations; 40 CFR part 63, subpart VVV, Publicly Owned Treatment Works; 40 CFR part 63, subpart VVVVVV, Chemical Manufacturing Area Sources; 40 CFR part 63, subpart GG, Aerospace Manufacturing and Rework Facilities; and 40 CFR part 63, subpart T, Halogenated Solvent Cleaning. NESHAP impose emission standards and/or work practice requirements reflecting maximum achievable control technology or impose emission standards and/or work practice requirements reflecting generally available control technology. The CAA requires residual risk reviews for standards reflecting maximum achievable control technologies, and technology reviews are required every 8 years for all NESHAP.

In the 2023 TCE proposed rule, EPA requested comment on any anticipated increases or decreases in future releases of TCE, as well as any modifications to requirements in the exposure control plan to account for air monitoring or fenceline impacts. As described in more detail in Section 8.1 of the Response to

Comments document (Ref. 11), several commenters provided input on EPA's fenceline analysis, with some stating their position that the fenceline analysis is not suitable for purposes of risk determination and should not be used to inform risk management (Refs. 35, 81, 78, 94), while other commenters stated that EPA's fenceline analysis insufficiently considered increased susceptibility to harm from TCE exposures in populations more likely to experience adverse health effects (Ref. 95). Regarding the management of any risks to fenceline communities from ambient air or water exposures, several commenters emphasized the need to protect fenceline communities at risk from TCE exposure related to conditions of use with longer phase-out periods (Ref. 45) and described their efforts, as a local government agency, to protect community members at risk of releases of TCE from neighboring businesses (Ref. 47). Several commenters stated they would support a requirement for additional monitoring or attesting in a WCPP that controls would not increase TCE emissions and impact fenceline communities (Refs. 31, 45, 44, 96). Industry commenters disagreed, stating that attestations or monitoring would be burdensome or redundant with requirements under NESHAP that regulate TCE (Refs. 39, 38, 78). Instead, these commenters recommended that any necessary release information should instead be documented through the results of the sampling done when processes change.

As discussed in more detail in the Response to Comments document (Ref. 11), EPA agrees that the screening level fenceline analyses for the water pathway and ambient air pathway for TCE do not allow EPA to conclude whether those risks of injury to fenceline communities contribute to the unreasonable risk because those fenceline screening methodologies were not developed for that purpose. EPA is eventually prohibiting all of the conditions of use that are associated with facilities that indicate potential exposure to fenceline communities, which would eventually address such exposure. Additionally, EPA determined facility resources should be focused on transitioning as quickly as possible to alternatives for TCE. Requiring owners and operators to attest to whether and why the exposure controls they have selected would not result in increased air releases of TCE from the workplace could divert resources from transitioning to alternatives. Therefore, in the WCPP requirements in this final rule, EPA is not requiring owners and operators to attest to whether and why the exposure controls they have selected would not result in increased air releases of TCE from the workplace and keep records of that statement as part of the WCPP exposure control plan. EPA emphasizes that the ultimate prohibition of manufacture, processing, distribution in commerce, use, and disposal of TCE is expected to address the risks identified in the screening analysis to any general population or fenceline communities close to facilities engaging in TCE use. EPA therefore does not intend to revisit the air pathway for TCE as part of a supplemental risk evaluation.

B. Environmental Effects and the Magnitude of Environmental Exposure

EPA's analysis of the environmental effects of TCE and the magnitude of exposure of the environment to TCE are in the 2020 Risk Evaluation for TCE (Ref. 1). The unreasonable risk determination for TCE is based solely on risks to human health (Ref. 2); based on the TSCA 2020 Risk Evaluation for TCE, EPA determined that exposures to the environment did not drive the unreasonable risk. A summary is presented here.

For all conditions of use, amphibian, fish, and aquatic invertebrate acute and chronic exposures to TCE do not drive the unreasonable risk. To characterize the exposure to TCE by aquatic organisms, EPA assessed environmental exposures derived from predicted and measured concentrations of TCE in surface water in the United States. Specifically, the aquatic exposures associated with the industrial and commercial conditions of use were predicted through modeling, and the aquatic exposure assessment also includes an analysis of collected measured surface water concentrations from monitoring data. EPA considered the biological relevance of the species to determine the concentrations of concern for the location of surface water concentration data to produce risk quotients, as well as frequency and duration of the exposure. EPA determined that the evaluation does not support an unreasonable risk determination based on risk to aquatic organisms.

The toxicity of TCE to sediment-dwelling invertebrates is similar to the toxicity to aquatic invertebrates. TCE is expected to remain in aqueous phases and not adsorb to sediment due to its water solubility and low partitioning to organic matter. TCE has relatively low partitioning to organic matter and biodegrades slowly, so TCE concentrations in sediment pore water are expected to be similar to the concentrations in the overlying water or lower in the deeper part of sediment where anaerobic condition prevails. Thus, the TCE detected in sediments is likely from the pore water. Therefore, for sediment-dwelling organisms, the risk estimates, based on the highest ambient surface water concentration, do not support an unreasonable risk determination based on risk to sediment-dwelling organisms from acute or chronic exposures.

For terrestrial organisms, TCE exposure is expected to be low since physical-chemical properties do not support an exposure pathway through water and soil pathways to these organisms. Therefore, for terrestrial organisms, the risk estimates for acute or chronic exposures, based on the EPA 2003 Guidance for Ecological Soil Screening Levels, do not support an unreasonable risk determination.

C. Benefits for Various Uses

As described in the 2023 TCE proposed rule, TCE has a wide range of uses, including as an intermediate during the manufacture of refrigerants, specifically HFC–134a, and is also used as a solvent, frequently in cleaning and degreasing (including spot cleaning, vapor degreasing, cold cleaning, and aerosol degreasing). A variety of consumer and commercial products use TCE as adhesives and sealants, in paints and coatings, and in other miscellaneous products. TCE is subject to Federal and State regulations and reporting requirements.

The largest uses of TCE, by production volume, are for processing as a reactant/intermediate as well as aerosol and vapor degreasing uses. Based on the 2020 Risk Evaluation for TCE, over 84% of the production volume of TCE is processed as a reactant/intermediate. The majority of the volume is for TCE processed as an intermediate in the production of HFC–134a, a refrigerant widely used in a broad range of applications. The second largest use of TCE is in industrial and commercial uses for aerosol and vapor degreasing. TCE is a relatively inexpensive solvent useful for cleaning contaminated metal parts and other fabricated materials (Ref. 1).

TCE has many other uses, which, based on the 2020 Risk Evaluation for TCE, collectively constitute about 1% of the production volume (Ref. 1). In battery separator manufacturing, TCE is used as an extraction solvent to produce the desired porosity in lead-acid and lithium battery separators, which are essential to power vehicles and systems in the U.S. supply chain.

D. Reasonably Ascertainable Economic Consequences of the Final Rule

1. Likely Effect of the Rule on the National Economy, Small Business, Technological Innovation, the Environment, and Public Health

The reasonably ascertainable economic consequences of this rule include several components, all of which are described in the Economic Analysis for this rule (Ref. 3). With respect to the anticipated effects of this rule on the national economy, EPA considered the number of businesses and workers that would be affected and the costs and benefits to those businesses and workers and did not find that there would be an impact on the national economy (Ref. 3). The economic impact of a regulation on the national economy becomes measurable only if the economic impact of the regulation reaches 0.25% to 0.5% of Gross Domestic Product (GDP) (Ref. 3). Given the current (real) GDP [of $60.4 trillion (2022)], this is equivalent to a cost of $151 billion to $302 billion. Therefore, because EPA has estimated that the monetized costs of the rule at $64.1 million annualized over 20 years at a 2% discount rate, $ 71.2 million annualized over 20 years at a 3% discount rate, and $102.4 million annualized over 20 years at a 7% discount rate, EPA has concluded that this action is highly unlikely to have any measurable effect on the national economy (Ref. 3). EPA does not have data to quantify employment impacts of the final rule. Instead, workers currently using TCE are expected to continue employment while shifting away from TCE use and towards alternatives. However, EPA acknowledges that transitional employment impacts may be experienced by some workers at facilities that opt to close or shift operations abroad instead of complying with requirements at the facilities currently using TCE. EPA considered the employment impacts of this final rule and found that the direction of change in employment is uncertain, but EPA expects the short-term and longer-term employment effects to be small.

Of the small businesses potentially impacted by this rule, 98.5% are expected to have impacts of less than 1% to their firm revenues, 0% are expected to have impacts between 1 and 3% to their firm revenues, and 1.5% are expected to have impacts greater than 3% to their firm revenues. The largest segment of businesses that will be affected by this regulation are commercial users of liquid and aerosol degreasers. Costs of alternatives were found to be both higher and lower than products containing TCE. For most product types, alternatives with similar efficacy are available with costs that both lower and higher than TCE products. However, there may be some applications where TCE is more effective, reducing labor time and wait time, and/or where extensive safety testing might be required. EPA was unable to quantify these costs.

With respect to this rule's effect on technological innovation, EPA expects this action to spur more innovation than it will hinder. A prohibition or significant restriction on the manufacture, processing, and distribution in commerce of TCE for uses covered in this final rule may increase demand for safer chemical substitutes. This rule is not likely to have significant effects on the environment because TCE does not present an unreasonable risk to the environment, though this rule does present the potential for small reductions in air emissions and soil contamination associated with improper disposal of products containing TCE. The effects of this rule on public health are estimated to be positive, due to the reduced risk of cancer and other non-cancer endpoints from exposure to TCE.

2. Costs and Benefits of the Regulatory Action and of the One or More Primary Alternative Regulatory Actions Considered by the Administrator

The costs and benefits that can be monetized for this rule are described at length in in the Economic Analysis (Ref. 3). The monetized costs for this rule are estimated to range from $64.1 million annualized over 20 years at a 2% discount rate, $71.2 million annualized over 20 years at a 3% discount rate, and $102.4 million annualized over 20 years at a 7% discount rate. The monetized benefits are estimated to range from $22.9 to $23.2 million annualized over 20 years at a 2% discount rate, $18.2 to $18.3 million annualized over 20 years at a 3% discount rate and $8.7 to $8.9 million annualized over 20 years at a 7% discount rate.

EPA considered the estimated costs to regulated entities as well as the cost to administer and enforce an alternative regulatory action. Estimated costs for regulatory alternative can be found in the Economic Analysis for this final rule (Ref. 3).

This final rule is expected to achieve health benefits for the American public, some of which can be monetized and others that, while tangible and significant, cannot be monetized. EPA determined that the balance of costs and benefits of this rule cannot be fairly described without considering the additional, non-monetized benefits of mitigating the non-cancer adverse effects. These effects may include neurotoxicity, kidney toxicity, liver toxicity, immunological and hematological effects, reproductive effects, and developmental effects. The multitude of adverse effects from TCE exposure can profoundly impact an individual's quality of life, as discussed in the proposed rule in Unit II.A. (overview), in this rule in Unit II.C.3. (description of the unreasonable risk), Unit V.A. (discussion of the health effects), and the 2020 Risk Evaluation for TCE. Chronic adverse effects of TCE exposure include both cancer and the non-cancer effects listed in this paragraph. Acute effects of TCE exposure could be experienced for a shorter portion of life but are nevertheless significant in nature. The incremental improvements in health outcomes achieved by given reductions in exposure cannot be quantified for non-cancer health effects associated with TCE exposure, and therefore cannot be converted into monetized benefits. The qualitative discussion throughout this rulemaking and in the Economic Analysis highlights the importance of the non-cancer effects. The value of reducing these effects includes willingness-to-pay to avoid illness, which includes cost of illness and other personal costs such as pain and suffering. Considering only monetized benefits underestimates the impacts of TCE adverse outcomes and therefore underestimates the benefits of this rule.

3. Cost Effectiveness of the Regulatory Action and of One or More Primary Alternative Regulatory Actions Considered by the Administrator

Cost effectiveness is a method of comparing certain actions in terms of the expense per item of interest or goal. A goal of this regulatory action is to prevent unreasonable risk resulting from exposure to TCE. The final rule would cost $15.4 million per potential prevented cancer case while the alternative regulatory action would cost $18.6 million using annualized costs for the 2 percent discount rate and cancer cases avoided from one year of reduced exposure under the policy options (the average across the 20-year analytical timeframe). Thus, the final rule has a lower cost per cancer case avoided compared to the alternative option, making it the most cost-effective of the two options considered. The primary differences between the final and alternative option are that the alternative includes fewer TSCA section 6(g) exemptions delaying prohibitions

on some uses which fall under interim WCPP in the final rule and a lower interim ECEL (0.0011 ppm). EPA received multiple public comments providing information on the impacts of a lower ECEL level and the need for longer duration and additional limited exemptions.

VI. TSCA Section 9 Analysis and Section 14 and 26 Considerations

A. TSCA Section 9(a) Analysis

TSCA section 9(a) provides that, if the Administrator determines, in the Administrator's discretion, that an unreasonable risk may be prevented or reduced to a sufficient extent by an action taken under a Federal law not administered by EPA, the Administrator must submit a report to the agency administering that other law that describes the risk and the activities that present such risk. TSCA section 9(a) describes additional procedures and requirements to be followed by EPA and the other Federal agency after submission of the report. As discussed in this Unit, the Administrator does not determine that unreasonable risk from TCE under the conditions of use may be prevented or reduced to a sufficient extent by an action taken under a Federal law not administered by EPA. EPA's section 9(a) analysis can be found in full in Unit VIII.A. of the 2023 TCE proposed rule, and responses to comments on that 9(a) analysis can be found in the Response to Comments document, section 9.1 (Ref. 11).

TSCA section 9(d) instructs the Administrator to consult and coordinate TSCA activities with other Federal agencies for the purpose of achieving the maximum enforcement of TSCA while imposing the least burden of duplicative requirements. For this rulemaking, EPA has coordinated with appropriate Federal executive departments and agencies including but not limited to OSHA and the Consumer Product Safety Commission (CPSC), to, among other things, identify their respective authorities, jurisdictions, and existing laws with regard to the risk evaluation and risk management of TCE.

As discussed in more detail in the 2023 TCE proposed rule, OSHA requires that employers provide safe and healthful working conditions by setting and enforcing standards and by providing training, outreach, education, and assistance. OSHA, in 1971, established a PEL for TCE of 100 ppm of air as an 8-hour TWA with an acceptable ceiling concentration of 200 ppm and an acceptable maximum peak above the acceptable ceiling concentration for an eight-hour shift of 300 ppm, with a maximum duration of 5 minutes in any 2 hours. However, the exposure limits established by OSHA are higher than the exposure limit that EPA determined will be sufficient to address the unreasonable risk identified under TSCA from occupational inhalation exposures associated with certain conditions of use. Gaps exist between OSHA's authority to set workplace standards under the OSH Act and EPA's obligations under TSCA section 6 to eliminate unreasonable risk presented by chemical substances under the conditions of use. The U.S. CPSC, under authority provided to it by Congress in the CPSA, protects the public from unreasonable risk of injury or death associated with consumer products. Under the CPSA, CPSC has the authority to regulate TCE in consumer products, but not in other sectors such as automobiles, some industrial and commercial products, or aircraft for example.

EPA therefore concludes that TSCA is the only regulatory authority able to prevent or reduce unreasonable risk of TCE to a sufficient extent across the range of conditions of use, exposures, and populations of concern. An action under TSCA is also able to address occupational unreasonable risk and would reach entities that are not subject to OSHA. Moreover, the timeframe and any exposure reduction as a result of updating OSHA or CPSC regulations for TCE cannot be estimated, while TSCA imposes a much more accelerated two-year statutory timeframe for proposing and finalizing requirements to address unreasonable risk. Regulating TCE's unreasonable risk utilizing TSCA authority will also avoid the situation where a patchwork of regulations among several Agencies using multiple laws and differing legal standards would occur and is therefore a more efficient and effective means of addressing the unreasonable risk of TCE. Finally, as discussed in greater detail in the 2023 TCE proposed rule, the 2016 amendments to TSCA altered both the manner of identifying unreasonable risk and EPA's authority to address unreasonable risk, such that risk management is increasingly distinct from provisions of the CPSA, FHSA, or OSH Act. For these reasons, in the Administrator's discretion, the Administrator has analyzed this issue and does not determine that unreasonable risk from TCE may be prevented or reduced to a sufficient extent by an action taken under a Federal law not administered by EPA.

B. TSCA Section 9(b) Analysis

If EPA determines that actions under other Federal laws administered in whole or in part by EPA could eliminate or sufficiently reduce a risk to health or the environment, TSCA section 9(b) instructs EPA to use these other authorities to protect against that risk "unless the Administrator determines, in the Administrator's discretion, that it is in the public interest to protect against such risk" under TSCA. In making such a public interest finding, TSCA section 9(b)(2) states: "the Administrator shall consider, based on information reasonably available to the Administrator, all relevant aspects of the risk . . . and a comparison of the estimated costs and efficiencies of the action to be taken under this title and an action to be taken under such other law to protect against such risk."

Although several EPA statutes have been used to limit TCE exposure (Ref. 10), regulations under those EPA statutes largely regulate releases to the environment, rather than occupational or consumer exposures. While these limits on releases to the environment are protective in the context of their respective statutory authorities, regulation under TSCA is also appropriate for occupational and consumer exposures and in some cases can provide upstream protections that would prevent the need for release restrictions required by other EPA statutes (*e.g.*, RCRA, CAA, CWA). Updating regulations under other EPA statutes would not be sufficient to address the unreasonable risk of injury to the health of workers, occupational non-users, consumers, and bystanders who are exposed to TCE under its conditions of use. EPA's section 9(b) analysis can be found in full in Unit VIII.B. of the 2023 TCE proposed rule, and EPA's responses to comments on that section 9(b) analysis can be found in the Response to Comments document, section 9.2 (Ref. 11).

For these reasons, the Administrator does not determine that unreasonable risk from TCE under its conditions of use, as evaluated in the 2020 Risk Evaluation for TCE (Ref. 1), could be eliminated or reduced to a sufficient extent by actions taken under other Federal laws administered in whole or in part by EPA.

C. TSCA Section 14 Requirements

EPA is also providing notice to manufacturers, processors, and other interested parties about potential impacts to CBI. Under TSCA sections 14(a) and (b)(4), if EPA promulgates a rule pursuant to TSCA section 6(a) that

establishes a ban or phaseout of a chemical substance, the protection from disclosure of any CBI regarding that chemical substance and submitted pursuant to TSCA will be "presumed to no longer apply," subject to the limitations identified in TSCA section 14(b)(4)(B)(i) through (iii). Pursuant to TSCA section 14(b)(4)(B)(iii), the presumption against protection from disclosure will apply only to information about the specific conditions of use that this rule prohibits or phases out. Per TSCA section 14(b)(4)(B)(i), the presumption against protection will not apply to information about certain emergency uses that this rule exempts from a ban or phaseout pursuant to TSCA section 6(g). Manufacturers or processors seeking to protect such information may submit a request for nondisclosure as provided by TSCA sections 14(h)(4)(C) and 14(g)(1)(E). Any request for nondisclosure must be submitted within 30 days after receipt of notice from EPA under TSCA section 14(g)(2)(A) stating EPA will not protect the information from disclosure. EPA anticipates providing such notice via the Central Data Exchange.

D. TSCA Section 26 Considerations

As explained in the 2023 TCE proposed rule, EPA fulfilled TSCA section 26(h) by using scientific information, technical procedures, measures, methods, protocols, methodologies, and models consistent with the best available science. Comments received on the proposed rule about whether EPA adequately assessed reasonably available information under TSCA section 26 on the risk evaluation, and responses to those comments, can be found in the Response to Comments document, sections 2.1 and 3.1 (Ref. 11).

VII. References

The following is a listing of the documents that are specifically referenced in this document. The docket includes these documents and other information considered by EPA, including documents that are referenced within the documents that are included in the docket, even if the referenced document is not itself physically located in the docket. For assistance in locating these other documents, please consult the person listed under **FOR FURTHER INFORMATION CONTACT**.

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93. EPA. National Emission Standards for Benzene Final Rule. 54 FR 38044. September 14, 1989.
94. American Petroleum Institute. Comments on the Proposed Rulemaking for Trichloroethylene; Regulation Under the Toxic Substances Control Act (TSCA). Document ID No. EPA–HQ–OPPT–2020–0642–0263. December 12, 2023.
95. San Francisco Program on Reproductive Health and the Environment University of California. Comments on the Proposed Rulemaking for Trichloroethylene; Regulation Under the Toxic Substances Control Act (TSCA). Document ID No. EPA–HQ–OPPT–2020–0642–0314. December 15, 2023.
96. Anonymous. Comments on the Proposed Rulemaking for Trichloroethylene; Regulation Under the Toxic Substances Control Act (TSCA). EPA–HQ–OPPT–2020–0642–0372. November 9, 2023.
97. EPA. Supporting Statement for an Information Collection Request (ICR) Under the Paperwork Reduction Act (PRA). 2024.
98. EPA. Second Existing Chemical Exposure Limit (ECEL) (Developmental Toxicity) for Occupational Use of Trichloroethylene; Appendix B. March 31, 2022.

VIII. Statutory and Executive Order Reviews

Additional information about these statutes and executive orders can be found at *https://www.epa.gov/laws-regulations/*laws-and-executive-orders.

A. Executive Order 12866: Regulatory Planning and Review and Executive Order 14094: Modernizing Regulatory Review

This action is a "significant regulatory action" as defined in Executive Order 12866 (58 FR 51735, October 4, 1993), as amended by Executive Order 14094 (88 FR 21879, April 11, 2023). Accordingly, EPA submitted this action to the Office of Management and Budget (OMB) for Executive Order 12866 review. Documentation of any changes made in response to Executive Order 12866 review is available in the docket. EPA prepared an analysis of the potential costs and benefits associated with this action (Ref. 3), which is available in the docket and summarized in Unit I.E.

B. Paperwork Reduction Act (PRA)

The information collection activities in this final rule have been submitted to OMB for approval under the PRA, 44 U.S.C. 3501 *et seq.* The Information Collection Request (ICR) document that EPA prepared has been assigned EPA ICR No. 2775.02 and OMB Control No. 2070–0232 (Ref. 97). The ICR is in the docket and is briefly summarized here. The information collection requirements are not enforceable until OMB approves them.

There are two primary provisions of the rule that may increase burden under the PRA. The first is downstream notification, which is required to be carried out by updates to the relevant SDS and required for manufacturers, processors, and distributors in commerce of TCE, who would provide notice to companies downstream upon shipment of TCE about the prohibitions. The information submitted to downstream companies through the SDS would provide knowledge and awareness of the restrictions to these companies. The second primary provision of the rule that may increase burden under the PRA is WCPP-related information generation, recordkeeping, and notification requirements (including development of exposure control plans; exposure level monitoring and related recordkeeping; development of documentation for a PPE program and related recordkeeping; development of documentation for a respiratory protection program and related recordkeeping; development and notification to potentially exposed persons (employees and others in the workplace) about how they can access the exposure control plans, exposure monitoring records, PPE program implementation documentation, and respirator program documentation; and development of documentation demonstrating eligibility for an exemption from the prohibitions, and related recordkeeping).

Respondents/affected entities: Persons that manufacture (including import), process, distribute in commerce, use, or dispose of TCE or products containing TCE. See also Unit I.A.

Respondent's obligation to respond: Mandatory (TSCA section 6(a) and 40 CFR part 751).

Estimated number of respondents: 23,070.

Frequency of response: On occasion.

Total estimated burden: 38,625 hours (per year). Burden is defined at 5 CFR 1320.3(b).

Total estimated cost: $7,953,367 (per year), includes $5,351,750 annualized capital or operation and maintenance costs.

An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. The OMB control numbers for EPA regulations in 40 CFR are listed in 40 CFR part 9. When OMB approves this ICR, the OMB control number will be included on the approved collection instruments and added to 40 CFR part 9 to display the valid OMB control number assigned to the approved information collection activities contained in this final rule.

C. Regulatory Flexibility Act (RFA)

Pursuant to sections 603 and 609(b) of the RFA, 5 U.S.C. 601 *et seq.*, EPA prepared an IRFA for the 2023 TCE proposed rule (Ref. 20) and convened a SBAR Panel to obtain advice and recommendations from SERs that potentially would be subject to the rule's requirements. Summaries of the IRFA and Panel recommendations are presented in the 2023 TCE proposed rule, and copies of the related documents are in the docket.

As required by section 604 of the RFA, EPA prepared a FRFA for this action (Ref. 21). The FRFA addresses the issues raised by public comments on the IRFA for the proposed rule. The complete FRFA is available in the docket and is summarized here.

1. Statement of Need and Rule Objectives

Under TSCA section 6(a) (15 U.S.C. 2605(a)), if EPA determines after a TSCA section 6(b) risk evaluation that a chemical substance presents an unreasonable risk of injury to health or the environment, without consideration of costs or other non-risk factors, including an unreasonable risk to a PESS identified as relevant to the risk evaluation, under the conditions of use, EPA must by rule apply one or more requirements listed in TSCA section 6(a) to the extent necessary so that the chemical substance or mixture no longer presents such risk. TCE was the subject of a risk evaluation under TSCA section 6(b)(4)(A) that was issued in November 2020. In addition, in January 2023, EPA issued a revised unreasonable risk determination that TCE as a whole chemical substance presents an unreasonable risk of injury to health under the conditions of use. As a result, EPA is taking action to the extent necessary so that TCE no longer presents such risk.

EPA developed this final rule after considering EPA's unreasonable risk determination for TCE, information provided in public comments on the proposed rule, findings from and comments on the SBAR Panel, other required consultations, and additional public outreach. More information on the 2023 TCE proposed rule, SBAR Panel, and outreach efforts for this action, is available in the docket for this rulemaking.

To address the identified unreasonable risk, this rule (1) prohibits the manufacture (including import), processing, and distribution in commerce of TCE for all uses (including all consumer uses), with longer timeframes for manufacture and processing related to certain uses and time-limited TSCA 6(g) exemptions for certain conditions of use; (2) requires strict workplace controls, including a TCE WCPP, which would include requirements for an inhalation exposure limit and glove requirements to limit dermal exposure to TCE, for conditions of use with long term phase-outs or time-limited exemptions under TSCA section 6(g); (3) establishes recordkeeping and downstream notification requirements; and (4) provides certain time-limited exemptions from requirements for conditions of use of TCE that are critical and essential, for which no technically and economically feasible, safer alternative is available, or where compliance with the requirement would significantly disrupt the national economy, national security, or critical infrastructure.

2. Significant Issues Raised by the Public Comments in Response to the IRFA and EPA Response

A summary of significant issues raised by comments about the IRFA (Ref. 20) and EPA's response is in the Response to Comments document (Ref 11), section 10.2.

3. SBA Office of Advocacy Comments and EPA Response

SBA Office of Advocacy provided comments on the proposed rule (EPA–HQ–OPPT–2020–0624). A summary of these comments and EPA's response is in section 3 of the FRFA (Ref. 21).

4. Estimate of the Number of Small Entities to Which the Final Rule Applies

This final rule potentially affects small manufacturers (including importers), processors, distributors, retailers, users of TCE or of products containing TCE, and entities engaging in disposal. EPA estimates that the rule would affect approximately 21,599 overall firms, of which 98.5% small entities have estimated impacts of less than 1% of revenues. End users with economically and technologically feasible alternatives are estimated to only incur costs associated with rule familiarization. For a full description of the estimated number of small entities affected by this rule, see the FRFA (Ref. 21).

5. Projected Reporting, Recordkeeping, and Other Compliance Requirements of the Final Rule

a. Compliance Requirements

EPA is prohibiting all conditions of use of TCE. As described in the final rule, EPA is prohibiting all manufacturing (including import), processing, and distribution in commerce of TCE for all uses (including all consumer uses), as described in Unit IV.B.2. with longer compliance timeframes for manufacture and processing related to certain uses and TSCA section 6(g) exemptions for certain conditions of use. EPA is also requiring strict workplace controls, including compliance with a TCE WCPP, which would include requirements for an interim ECEL, as well as dermal protection, to limit exposure to TCE, for conditions of use with long term phase-outs or time-limited exemptions under TSCA section 6(g), as described in Units IV.B., IV.E., and IV.G. After December 17, 2024, prohibitions on manufacturing, processing, and distribution in commerce of TCE for consumer use will occur in 90 days for manufacturers (*i.e.*, on March 17, 2025), 180 days for processors and distributors (*i.e.*, on June 16, 2025), and 270 days for industrial and commercial users and disposal (*i.e.*, on September 15, 2025), except as specified in paragraphs (b)(4) through (25) of section 751.305.

An interim WCPP encompasses inhalation exposure thresholds, includes monitoring and recordkeeping requirements to verify that those thresholds are not exceeded, and other components, such as dermal protection, while EPA determined that prohibition of all conditions of use is ultimately necessary to address the unreasonable risk.

b. Classes of Small Entities Subject to the Compliance Requirements

The small entities that would be potentially directly regulated by this rule are small businesses that manufacture (including import), process, distribute in commerce, use, or dispose of TCE, including retailers of TCE for end-consumer uses.

c. Professional Skills Needed To Comply

Entities subject to this rule that manufacture (including import), process, or distribute TCE in commerce will be required to cease such activity. The entity will be required to modify their SDS or develop another way to inform their customers of the prohibition on manufacture, processing, and distribution of TCE. They are also required to maintain ordinary business records, such as invoices and bills-of-lading, that demonstrate compliance with the prohibitions, restrictions, and other provisions of this regulation. These are all routine business tasks that do not require specialized skills or training.

Entities that use TCE in any industrial and commercial capacity will be required to cease, with some timeframes for prohibitions longer than others. Restriction or prohibition of these uses would likely require the implementation of an alternative chemical or the cessation of use of TCE in a process or equipment that may require persons with specialized skills, such as engineers or other technical experts. Instead of developing an alternative method themselves, commercial users of TCE may choose to contract with another entity to do so.

Entities that are permitted, on a time-limited basis until prohibition, to continue to manufacture, process, distribute, or use TCE are required to implement a WCPP for continued use of TCE. A transition to a WCPP may require persons with specialized skills such as an engineer or health and safety professional. Instead of implementing the WCPP, entities that use TCE may choose to contract with another entity to do so. Records have to be maintained for compliance with a WCPP, as applicable. While this recording activity itself may not require a special skill, the information to be measured and recorded may require persons with specialized skills such as an industrial hygienist.

6. Steps Taken To Minimize Economic Impact to Small Entities

a. SBAR Panel

As required by section 609(b) of the RFA, EPA conducted outreach to small entities and convened a SBAR Panel to obtain advice and recommendations of representatives of the small entities that potentially would be subject to the rule's requirements. The Panel solicited input on all aspects of these proposed regulations. Six potentially impacted small entities served as small-entity representatives (SERs) to the Panel, representing a broad range of small entities from diverse geographic locations. The Panel Report was signed on April 4, 2023 (Ref. 19).

Consistent with the RFA requirements, the Panel evaluated the assembled materials and small-entity comments on issues related to elements of the regulatory flexibility analysis. It is important to note that the Panel's findings and discussion were based on the information available at the time the final report was prepared. For the full list of Panel recommendations, see Section 8.A. of the FRFA (Ref. 21).

EPA detailed the SBAR Panel's request for comment on these specific topics in the IRFA and proposed rule and solicited comment from the public. During the comment period, the public provided comment on some of these areas. Those comments and others received on the proposed rule and EPA's responses are in the Response to Comments document (Ref. 11).

b. Alternatives Considered

EPA analyzed alternative regulatory approaches to identify which would be feasible, reduce burden to small businesses, and achieve the objective of the statute (*i.e.*, applying one or more requirements listed in TSCA section 6(a) to the extent necessary so that the chemical substance or mixture no longer presents an unreasonable risk). As described in more detail in Unit VI. of the proposed rule, and Unit II.D. of the final rule, EPA considered several factors, in addition to identified unreasonable risk, when selecting among possible TSCA section 6(a) requirements. To the extent practicable, EPA factored into its decisions: the effects of TCE on health and the environment, the magnitude of exposure to TCE of human beings and the environment, the benefits of TCE for various uses, and the reasonably ascertainable economic consequences of the rule. As part of this analysis, EPA considered—in addition to the prohibitions described in Unit IV.—a wide variety of control measures to address the unreasonable risk from TCE such as a WCPP, weight fractions, a certification and limited access program, and prescriptive controls. EPA's analysis of these risk management approaches is detailed in Unit VI.A.3. of the proposed rule.

Based on consideration of public comments received on the proposed rule, EPA has made some changes from the proposed rule to the final rule. These changes include aspects of the WCPP, longer compliance timeframes for certain uses, and TSCA section 6(g) exemptions for certain conditions of use. EPA is also requiring strict workplace controls, including compliance with a TCE WCPP, which would include requirements for an interim ECEL, as well as dermal protection, to limit exposure to TCE, for conditions of use with long term phase-outs or time-limited exemptions. Additional changes to the rule based on consideration of public comments are detailed in Unit III. of the final rule and include identification of a regulatory threshold for TCE. For additional information and rationale towards alternative actions, see Unit III.D. of this final rule and Section 8.B. of the FRFA (Ref. 21).

In addition, EPA is preparing a Small Entity Compliance Guide to help small entities comply with this rule. EPA expects that this guide will be made available on the EPA website prior to the effective date of this final rule.

D. Unfunded Mandates Reform Act (UMRA)

This action does not contain an unfunded mandate of $100 million (in 1995 dollars and adjusted annually for inflation) or more as described in UMRA, 2 U.S.C. 1531–1538, and does not significantly or uniquely affect small governments. The action will affect entities that use TCE. It is not expected to affect State, local, or Tribal governments because the use of TCE by government entities is minimal. The costs involved in this action are estimated not to exceed $183 million in 2023$ ($100 million in 1995$ adjusted for inflation using the GDP implicit price deflator) in any one year for State, local, and Tribal governments, in the aggregate, or for the private sector. Accordingly, this action is not subject to the requirements of sections 202, 203, or 205 of UMRA.

E. Executive Order 13132: Federalism

EPA has concluded that this action has federalism implications, as specified in Executive Order 13132 (64 FR 43255, August 10, 1999), because regulation under TSCA section 6(a) may preempt

state law. EPA provides the following federalism summary impact statement. The Agency consulted with state and local officials early in the process of developing the proposed action to permit them to have meaningful and timely input into its development. This included a consultation meeting on July 22, 2021, and a background presentation on September 9, 2020. EPA invited the following national organizations representing State and local elected officials to these meetings: Association of State Drinking Water Administrators, National Association of Clean Water Agencies, Western States Water Council, National Water Resources Association, American Water Works Association, Association of Metropolitan Water Agencies, Association of Clean Water Administrators, Environmental Council of the States, National Association of Counties, National League of Cities, County Executives of America, U.S. Conference of Mayors, and National Association of Attorneys General. A summary of the meeting with these organizations, including the views that they expressed, is available in the docket (Ref. 13). EPA provided an opportunity for these organizations to provide follow-up comments in writing but did not receive any such comments.

F. Executive Order 13175: Consultation and Coordination With Indian Tribal Governments

This action does not have Tribal implications as specified in Executive Order 13175 (65 FR 67249, November 9, 2000) because it will not have substantial direct effects on Tribal governments, on the relationship between the Federal Government and the Indian Tribes, or on the distribution of power and responsibilities between the Federal Government and Indian Tribes. TCE is not manufactured, processed, or distributed in commerce by Tribes and, therefore, this rulemaking would not impose substantial direct compliance costs on Tribal governments. Thus, Executive Order 13175 does not apply to this action.

Notwithstanding the lack of Tribal implications as specified by Executive Order 13175, EPA consulted with Tribal officials during the development of this action, consistent with the EPA Policy on Consultation and Coordination with Indian Tribes, which EPA applies more broadly than Executive Order 13175.

The Agency held a Tribal consultation from June 3, 2021, to August 20, 2021, with meetings on June 16 and July 6, 2021. Tribal officials were given the opportunity to meaningfully interact with EPA concerning the current status of risk management. During the consultation, EPA discussed risk management under TSCA section 6(a), findings from the 2020 Risk Evaluation for TCE, types of information to inform risk management, principles for transparency during risk management, and types of information EPA sought from Tribal officials. EPA briefed Tribal officials on the Agency's risk management considerations and Tribal officials raised no related issues or concerns to EPA during or in follow-up to those meetings (Ref. 14). EPA received no written comments as part of this consultation.

G. Executive Order 13045: Protection of Children From Environmental Health Risks and Safety Risks

Executive Order 13045 (62 FR 19885, April 23, 1997) directs Federal agencies to include an evaluation of the health and safety effects of the planned regulation on children in Federal health and safety standards and explain why the regulation is preferable to potentially effective and reasonably feasible alternatives. While the environmental health or safety risks addressed by this action present a disproportionate risk to children due to TCE's developmental toxicity, this action is not subject to Executive Order 13045 because it is not a significant regulatory action under section 3(f)(1) of Executive Order 12866. However, because there is evidence of an association between TCE and developmental toxicity, the prohibitions and restrictions on TCE in this final rule are expected to strengthen protection of children's health. In addition, EPA's *Policy on Children's Health* applies to this action. Information on how the policy was applied is available in Unit II.D.2.c.

H. Executive Order 13211: Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution or Use

This action is not a "significant energy action" under Executive Order 13211 (66 FR 28355, May 22, 2001) because it is not likely to have a significant adverse effect on the supply, distribution or use of energy and has not been designated by the Administrator of the Office of Information and Regulatory Affairs as a significant energy action.

I. National Technology Transfer and Advancement Act (NTTAA)

Pursuant to the NTTAA section 12(d), 15 U.S.C. 272, the Agency has determined that this rulemaking involves environmental monitoring or measurement, specifically for occupational inhalation exposures to TCE. Consistent with the Agency's Performance Based Measurement System (PBMS), EPA will not require the use of specific, prescribed analytic methods. Rather, the Agency will allow the use of any method that meets the prescribed performance criteria. The PBMS approach is intended to be more flexible and cost-effective for the regulated community; it is also intended to encourage innovation in analytical technology and improved data quality. EPA is not precluding the use of any method, whether it constitutes a voluntary consensus standard or not, as long as it meets the performance criteria specified.

For this rulemaking, the key consideration for the PBMS approach is the ability to accurately detect and measure airborne concentrations of TCE at the interim ECEL and the interim ECEL action level. Some examples of methods which meet the criteria are included in appendix B of the ECEL memo (Ref. 98). EPA recognizes that there may be voluntary consensus standards that meet the criteria (Ref. 98).

J. Executive Order 12898: Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations and Executive Order 14096: Revitalizing Our Nation's Commitment to Environmental Justice for All

EPA believes that the human health and environmental conditions that exist prior to this action result in or have the potential to result in disproportionate and adverse human health or environmental effects on communities with EJ concerns in accordance with Executive Order 14096 (88 FR 25251, April 26, 2023) (building on and supplementing Executive Order 12898 (59 FR 7629, February 16, 1994). As described more fully in the Economic Analysis for this rulemaking (Ref. 3), EPA conducted an analysis to characterize the baseline conditions faced by communities and workers affected by the regulation to identify the potential for disproportionate impacts on communities with environmental justice concerns using information about the facilities, workforce, and communities potentially affected by the regulatory options under current conditions, before the regulation would go into effect. The analysis drew on publicly available data provided by EPA and the U.S. Census Bureau, including data from the Toxics Release Inventory (TRI), Chemical Data Reporting (CDR), National Emissions Inventory (NEI), the American Community Survey (ACS), and the Quarterly Workforce Indicators

(QWI). The baseline characterization suggests that workers in affected industries and regions, as well as residents of nearby communities, are more likely to be people of color than the general population in affected states, although this varied by use assessed. Based on reasonably available information, EPA determined that there are potential environmental justice concerns in communities surrounding facilities subject to this regulation (Ref. 3).

EPA believes that this action is likely to reduce existing disproportionate and adverse effects on communities with environmental justice concerns. While this regulatory action applies requirements to the extent necessary so that TCE no longer presents an unreasonable risk, EPA is not able to quantify the distribution of the change in risk for affected populations. EPA is also unable to quantify the changes in risks for affected populations from non-TCE-using technologies or practices that firms may adopt in response to the regulation to determine whether any such changes could pose environmental justice concerns. Data limitations that prevent EPA from conducting a more comprehensive analysis are summarized in the Economic Analysis (Ref. 3).

EPA additionally identified and addressed potential EJ concerns by conducting outreach to advocates of communities that might be subject to disproportionate exposure to TCE. On June 16, 2021, and July 6, 2021, EPA held public meetings as part of this consultation (Ref. 18). See also Unit II.D. These meetings were held pursuant to Executive Order 12898 and Executive Order 14008, Tackling the Climate Crisis at Home and Abroad (86 FR 7619, February 1, 2021). EPA received three written comments following the EJ meetings, in addition to oral comments provided during the consultations (Refs. 15, 16, 17). In general, commentors supported strong regulation of TCE to protect lower-income communities and workers. Commenters supported strong outreach to affected communities, encouraged EPA to follow the hierarchy of controls, favored prohibitions, and noted the uncertainty, and, in some cases, inadequacy, of PPE.

The information supporting this Executive Order review is contained in Unit II.D., as well as in the Economic Analysis (Ref. 3). EPA's presentations, a summary of EPA's presentation and public comments made, and fact sheets for the EJ consultations related to this rulemaking are available at *https://www.epa.gov/assessing-and-managing-chemicals-under-tsca/materials-june-and-july-2021-environmental-justice*. These materials are also available in the docket for this rulemaking.

K. Congressional Review Act (CRA)

This action is subject to the CRA, 5 U.S.C. 801 *et seq.*, and the EPA will submit a rule report to each House of the Congress and to the Comptroller General of the United States. This action is not a "major rule" as defined by 5 U.S.C. 804(2).

List of Subjects in 40 CFR Part 751

Environmental protection, Chemicals, Export notification, Hazardous substances, Import certification, Reporting and recordkeeping.

Michael S. Regan,
Administrator.

Therefore, for the reasons stated in the preamble, 40 CFR chapter I is amended to read as follows:

PART 751—REGULATION OF CERTAIN CHEMICAL SUBSTANCES AND MIXTURES UNDER SECTION 6 OF THE TOXIC SUBSTANCES CONTROL ACT

■ 1. The authority citation for part 751 continues to read as follows:

Authority: 15 U.S.C. 2605, 15 U.S.C. 2625(l)(4).

■ 2. Add subpart D to read as follows:

Subpart D—Trichloroethylene (TCE)

Sec.

Subpart D—Trichloroethylene (TCE)

§ 751.301 General.

(a) *Applicability.* This subpart sets certain restrictions on the manufacture (including import), processing, distribution in commerce, use, and disposal of trichloroethylene (TCE) (CASRN 79–01–6) to prevent unreasonable risk of injury to health in accordance with TSCA section 6(a).

(b) *Regulatory threshold.* Unless otherwise specified in this subpart, the prohibitions and restrictions of this subpart do not apply to products containing TCE at thresholds less than 0.1 percent by weight. This threshold does not apply to wastewater.

(c) *Byproducts within site-limited, physically enclosed systems.* Unless otherwise specified in this subpart, the prohibitions and restrictions of this subpart do not apply to TCE processed as a byproduct when that byproduct TCE is processed within a site-limited, physically enclosed system that is part of the same overall manufacturing process from which the byproduct TCE was generated. This exclusion does not permit TCE to be present in any product that results from such site-limited, physically enclosed systems, except as permitted by paragraph (b) of this section.

(d) *Owner and operator requirements.* Any requirement for an owner or operator or an owner and operator is a requirement for any individual that is either an owner or an operator.

§ 751.303 Definitions.

The definitions in subpart A of this part apply to this subpart unless otherwise specified in this section. In addition, the following definitions apply:

Distribute in commerce has the same meaning as in section 3 of the Act, except that the term does not include retailers for purposes of § 751.321 and § 751.323.

Interim ECEL means a concentration of airborne TCE of 0.2 parts per million (ppm) calculated as an eight (8)-hour time weighted average (TWA) that will be in place only for the timeframes indicated for specified conditions of use, after which prohibitions would take effect.

Interim ECEL action level means a concentration of airborne TCE of 0.1 parts per million (ppm) calculated as an eight (8)-hour time-weighted average (TWA).

Site-limited has the same meaning as in 40 CFR 711.3.

§ 751.305 Prohibitions of manufacturing, processing, distribution in commerce, use and disposal.

(a) Applicability. The provisions of this section apply to the following:

(1) Manufacturing (including importing and manufacturing for export);

(2) Processing (including processing for export);

(3) All industrial and commercial uses;

(4) All consumer uses;

(5) Distribution in commerce; and

(6) Disposal of TCE to industrial pre-treatment, industrial treatment, or publicly owned treatment works.

(b) Prohibitions. (1) After March 17, 2025, all persons are prohibited from manufacturing (including importing and manufacturing for export) TCE, except as specified for manufacturing in paragraphs (b)(5) through (25) of this section.

(2) After June 16, 2025, all persons are prohibited from processing (including processing for export) and distributing in commerce (including making available) TCE, including any TCE-containing products, except as specified for processing or distributing in commerce in paragraphs (b)(5) through (25) of this section, and all retailers are prohibited from distributing in commerce (including making available) TCE for any use.

(3) After September 15, 2025, all persons are prohibited from industrial and commercial use of TCE, including any TCE-containing products, except as specified for industrial or commercial use in paragraphs (b)(5) through (25) of this section.

(4) After September 15, 2025, all persons manufacturing (including importing), processing, and using TCE are prohibited from disposal of TCE to industrial pre-treatment, industrial treatment, or publicly owned treatment works except as specified in paragraphs (b)(14), (23) (24), and (26) of this section.

(5) After June 16, 2025, all persons are prohibited from manufacturing (including importing) TCE for industrial and commercial use for batch vapor degreasing in open-top and closed-loop degreasing equipment, except for the use specified in paragraphs (b)(11), (15), (16), (17), (20), and (21) of this section.

(6) After September 15, 2025, all persons are prohibited from processing TCE for industrial and commercial use for batch vapor degreasing in open-top and closed-loop degreasing equipment, except for the use specified in paragraphs (b)(11), (15), (16), (17), (20), and (21) of this section.

(7) After December 18, 2025, all persons are prohibited from the industrial and commercial use of TCE for batch vapor degreasing in open-top and closed-loop degreasing equipment, except for the use specified in paragraphs (b)(11), (15), (16), (17), (20), and (21) of this section.

(8) After June 10, 2026, all persons are prohibited from manufacturing (including importing) TCE for: (i) Processing of TCE as a reactant/intermediate, except for the use as specified in paragraph (b)(18) of this section; and (ii) Processing TCE for the industrial and commercial use of TCE as a processing aid for: process solvent used in battery manufacture; process solvent used in polymer fiber spinning, fluoroelastomer manufacture and Alcantara manufacture; extraction solvent used in caprolactam manufacture; precipitant used in beta-cyclodextrin manufacture, except for those uses specified in paragraphs (b)(14), (23) and (24) of this section.

(9) After December 18, 2026, all persons are prohibited from: (i) Processing TCE as a reactant/intermediate, except for the use as specified in paragraph (b)(18) of this section; and (ii) Processing for and industrial and commercial use of TCE as a processing aid in: process solvent used in battery manufacture; process solvent used in polymer fiber spinning, fluoroelastomer manufacture and Alcantara manufacture; extraction solvent used in caprolactam manufacture; precipitant used in beta-cyclodextrin manufacture, except for those uses specified in paragraphs (b)(14), (23) and (24) of this section.

(10) After December 18, 2027, all persons are prohibited from industrial and commercial use of TCE in energized electrical cleaners and from the manufacturing (including importing), processing, and distribution in commerce of TCE for such a use.

(11) After December 18, 2029, all persons are prohibited from the industrial and commercial use of TCE as a solvent in closed-loop batch vapor degreasing for rayon fabric scouring for end use in producing rocket booster nozzles for Federal agencies and their contractors, and manufacturing (including importing), processing, and distribution in commerce of TCE for such use. If such persons obtain and maintain the records required by §§ 751.309 and 751.323 demonstrating that a final pre-launch test was completed using an alternative to TCE in the production of the rocket booster nozzles, the industrial and commercial use of TCE as a solvent in closed-loop batch vapor degreasing for rayon fabric scouring for end use in producing rocket booster nozzles for Federal agencies and their contractors, and manufacturing (including importing), processing, and distribution in commerce of TCE for such use may continue beyond December 18, 2029.

(12) After December 18, 2029, all persons are prohibited from industrial and commercial use of TCE in adhesives and sealants for essential aerospace applications, and from the manufacturing (including importing), processing, and distribution in commerce of TCE for such uses.

(13) After December 18, 2029, all persons are prohibited from the industrial and commercial use of TCE as a laboratory chemical for asphalt testing and recovery using manual centrifuge processes, and manufacturing (including importing), processing, and distribution in commerce of TCE for such use, as further detailed in § 751.311.

(14) After December 18, 2029, all persons are prohibited from the industrial and commercial use of TCE as a processing aid for lithium battery separator manufacturing, and the manufacturing (including importing), processing, and distribution in commerce of TCE for such use as well as the disposal of TCE from such industrial or commercial use to industrial pre-treatment, industrial treatment, or publicly owned treatment works.

(15) After December 18, 2029, all persons are prohibited from the industrial and commercial use of TCE for batch vapor degreasing for land-based DoD defense systems by Federal agencies and their contractors, and from the manufacturing (including importing), processing, and distribution in commerce of TCE for such use.

(16) After December 18, 2031, all persons are prohibited from the industrial and commercial use of TCE as a solvent in closed-loop batch vapor degreasing necessary for rocket engine cleaning by Federal Agencies and their contractors as described in § 751.325(b)(1) and the manufacturing (including importing), processing, and distribution in commerce of TCE for such use.

(17) After December 18, 2031, all persons are prohibited from the industrial and commercial use of TCE as a solvent in closed-loop and open-top batch vapor degreasing for essential aerospace parts and components and narrow tubing for medical devices, and manufacturing (including importing), processing, and distribution in commerce of TCE for such use as described in § 751.325(b)(2).

(18) After June 18, 2033, all persons are prohibited from the industrial and commercial use of TCE as an intermediate for manufacturing hydrofluorocarbon 134-a, also known as 1,1,1,2-tetrafluroethane (HFC–134a: CASRN 811–97–2), and manufacturing (including importing), processing, and distribution in commerce for such use as described in § 751.307.

(19) After December 18, 2034, all persons are prohibited from the industrial and commercial use of TCE in laboratory use for asphalt testing and recovery, and manufacturing (including importing), processing, and distribution in commerce of TCE for such use, as described in § 751.311.

(20) After December 18, 2034, all persons are prohibited from the industrial and commercial use of TCE as a solvent in closed-loop batch vapor degreasing for rayon fabric scouring for end use in producing rocket booster nozzles for Federal agencies and their contractors, and manufacturing (including importing), processing, and distribution in commerce of TCE for such use.

(21) After December 18, 2034, for vessels of the Armed Forces and their systems, and in the maintenance, fabrication, and sustainment for and of such vessels and systems, prohibit the industrial and commercial use of TCE as (and manufacturing (including importing), processing, and distribution in commerce of TCE for): potting compounds for naval electronic systems and equipment; sealing compounds for high and ultra-high vacuum systems; bonding compounds for materials testing and maintenance of underwater systems and bonding of nonmetallic materials; and cleaning agents to satisfy cleaning requirements (which includes degreasing using wipes, sprays, solvents and vapor degreasing) for: materials and components required for military ordnance testing; temporary resin repairs in vessel spaces where welding is not authorized; ensuring polyurethane adhesion for electronic systems and equipment repair and installation of elastomeric materials; various naval combat systems, radars, sensors, equipment; fabrication and prototyping processes to remove coolant and other residue from machine parts; machined part fabrications for naval systems; installation of topside rubber tile material aboard vessels; and vapor degreasing required for substrate surface preparation prior to electroplating processes.

(22) After December 18, 2034, all persons are prohibited from manufacturing (including import), processing, distribution in commerce, or use of TCE, including any TCE containing products, for industrial or commercial use in an emergency by NASA or its contractors as described in § 751.325(b)(4), and manufacturing (including importing), processing, and distribution in commerce of TCE for such use.

(23) After December 18, 2044, all persons are prohibited from the industrial and commercial use of TCE as a processing aid for lead-acid battery separator manufacturing, and the manufacturing (including importing), processing, and distribution in commerce of TCE for such use, as well as the disposal of TCE from such industrial or commercial use to industrial pre-treatment, industrial treatment, or publicly owned treatment works.

(24) After December 18, 2039, all persons are prohibited from the industrial and commercial use of TCE as a processing aid for specialty polymeric microporous sheet materials manufacturing, and the manufacturing (including importing), processing, and distribution in commerce of TCE for such use, as well as the disposal of TCE from such industrial or commercial use to industrial pre-treatment, industrial treatment, or publicly owned treatment works.

(25) After December 18, 2074, all persons are prohibited from industrial and commercial uses of TCE for the laboratory uses described in § 751.325(b)(7), and from the manufacturing (including importing), processing, and distribution in commerce of TCE for such uses.

(26) After December 18, 2074, all persons are prohibited from disposal of TCE to industrial pre-treatment, industrial treatment, or publicly owned treatment works for the purposes of cleanup projects of TCE-contaminated water and groundwater as described in § 751.325(b)(8).

§ 751.307 Phase-out of processing trichloroethylene to manufacture of HFC–134a.

(a) Baseline. Before June 16, 2025, each manufacturer of HFC–134a who processes TCE as an intermediate must establish a baseline annual volume of TCE processed as an intermediate.

(1) The manufacturer must use the average annual volume of any 12 consecutive months in the 3 years preceding December 17, 2024 to calculate the baseline.

(2) The manufacturer must retain records that demonstrate how the baseline annual volume was calculated, in accordance with § 751.323(d)(1).

(b) Phase-out. (1) Beginning June 7, 2027, each manufacturer of HFC–134a who processes TCE as an intermediate is not permitted to process TCE as an intermediate at an annual volume greater than 75 percent of the baseline.

(2) Beginning June 18, 2029, each manufacturer of HFC–134a who processes TCE as an intermediate is not permitted to process TCE as an intermediate at an annual volume greater than 50 percent of the baseline.

(3) Beginning June 18, 2031, each manufacturer of HFC–134a who processes TCE as an intermediate is not permitted to process TCE as an intermediate at an annual volume greater than 25 percent of the baseline so established.

(4) Beginning June 18, 2033, each manufacturer of HFC–134a who processes TCE as an intermediate is prohibited from processing TCE as an intermediate.

(c) Workplace chemical protection program. The owner or operator of the location where TCE is processed as an intermediate in accordance with this section, and manufacturers (including importers) and processors of TCE for such use, must comply with § 751.315.

(d) *Recordkeeping.* The owner or operator of the location where TCE is processed as an intermediate in accordance with this section must comply with the recordkeeping requirements in § 751.323.

§ 751.309 Phase-out of trichloroethylene use in vapor degreasing for rocket booster nozzles.

(a) In accordance with § 751.305(b)(11), until December 18, 2029, TCE may be used as a solvent in closed-loop batch vapor degreasing for rayon fabric scouring for end use in producing rocket booster nozzles for Federal agencies and their contractors, and manufactured (including imported), processed, and distributed in commerce for such use.

(b) From December 18, 2029, until December 18, 2034, TCE may only be used as a solvent in closed-loop batch vapor degreasing for rayon fabric scouring for end use in producing rocket booster nozzles, and manufactured (including imported), processed, and distributed in commerce for such use, by Federal agencies and their contractors who maintain records demonstrating that a final pre-launch test of rocket booster nozzles without using TCE was completed.

(c) If a suitable alternative to TCE is identified and validated before the end of this phase-out period, Federal agencies and their contractors must transition to that alternative.

(d) The owner or operator of the location where TCE is used as a solvent in closed-loop batch vapor degreasing for rayon fabric scouring for end use in producing rocket booster nozzles in accordance with this section, and manufacturers (including importers) and processors of TCE for such use, must comply with § 751.315.

(e) The owner or operator of the location where TCE is used as a solvent in closed-loop batch vapor degreasing for rayon fabric scouring for end use in producing rocket booster nozzles in accordance with this section must comply with the recordkeeping requirements in § 751.323.

§ 751.311 Phase-out of TCE use in the industrial and commercial use of TCE in laboratory use for asphalt testing and recovery.

(a) In accordance with § 751.305(b)(18), until December 18, 2034, TCE may be manufactured (including imported), processed, distributed in commerce, and used in industrial and commercial use of TCE in laboratory use for asphalt testing and recovery.

(b) From December 18, 2029, until December 18, 2034, TCE is only permitted to be manufactured (including imported), processed, distributed in commerce, and used in industrial and commercial use of TCE in laboratory use for asphalt testing and recovery for methods that do not include manual centrifuge processes.

(c) The use of TCE as a laboratory chemical must be performed on the premises of a laboratory.

(d) The owner or operator of the location where such use of TCE as a laboratory chemical occurs, and manufacturers (including importers) and processors of TCE for such use, must comply with the Workplace Chemical Protection Program provisions in § 751.315.

(e) The owner or operator of the location where such use of TCE as a laboratory chemical occurs must comply with the recordkeeping requirements in § 751.323.

§ 751.313 Phase-out of disposal of TCE to industrial pre-treatment, treatment, or publicly owned treatment works.

(a) After September 15, 2025, all persons manufacturing (including importing), processing, and using TCE are prohibited from disposal of TCE to industrial pre-treatment, industrial treatment, or publicly owned treatment works except as specified in the other subsections of this unit.

(b) After December 18, 2029, all industrial and commercial users of TCE for lithium battery separator manufacturing are prohibited from disposal of TCE to industrial pre-treatment, industrial treatment, or publicly owned treatment works.

(c) After December 18, 2039, all industrial and commercial users of TCE for specialty polymeric microporous sheet materials manufacturing are prohibited from disposal of TCE to industrial pre-treatment, industrial treatment, or publicly owned treatment works.

(d) After December 18, 2044, all industrial and commercial users of TCE for lead-acid battery separator manufacturing are prohibited from disposal of TCE to industrial pre-treatment, industrial treatment, or publicly owned treatment works.

(e) The owner or operator of the location where disposal of TCE to industrial pre-treatment, treatment, or to a publicly owned treatment works occurs must comply with the Workplace Chemical Protection Program provisions in § 751.315.

(f) The owner or operator of the publicly owned treatment works where disposal of TCE occurs must comply with the wastewater workplace protections in § 751.319.

(g) The owner or operator of the location where such use of TCE occurs must comply with the recordkeeping requirements in § 751.323.

§ 751.315 Workplace chemical protection program.

(a) Applicability. The provisions of this section apply to the following conditions of use of TCE when permitted to continue beyond December 18, 2025, pursuant to accordance with §§ 751.305(b)(8) through (25), 751.307, 751.309, and 751.311:

(1) Manufacturing (domestic manufacture);

(2) Manufacturing (import);

(3) Processing as a reactant/intermediate;

(4) Processing into formulation, mixture, or reaction product;

(5) Processing (repackaging);

(6) Processing (recycling);

(7) Industrial and commercial use of TCE as a processing aid in: process solvent used in battery manufacture; process solvent used in polymer fiber spinning, fluoroelastomer manufacture and Alcantara manufacture; extraction solvent used in caprolactam manufacture; precipitant used in beta-cyclodextrin manufacture;

(8) Industrial and commercial use of TCE as an adhesive and sealant for essential aerospace applications;

(9) Industrial and commercial use of TCE in other miscellaneous industrial and commercial uses (laboratory use);

(10) Industrial and commercial use of TCE as a solvent in closed-loop batch vapor degreasing for rayon fabric scouring for end use in rocket booster nozzle production by Federal agencies and their contractors;

(11) Industrial and commercial use of TCE in closed-loop or open-top batch vapor degreasing for essential aerospace parts and components and narrow tubing used for medical devices;

(12) Industrial and commercial use of TCE for vessels of the Armed Forces and their systems, and in the maintenance, fabrication, and sustainment for and of such vessels and systems; as potting compounds for naval electronic systems and equipment; sealing compounds for high and ultra-high vacuum systems; bonding compounds for materials testing and maintenance of underwater systems and bonding of nonmetallic materials; and cleaning agents to satisfy cleaning requirements (which includes degreasing using wipes, sprays, solvents and vapor degreasing) for: materials and components required for military ordnance testing; temporary resin repairs in vessel spaces where welding is not authorized; ensuring polyurethane adhesion for electronic systems and equipment repair and installation of elastomeric materials; various naval combat systems, radars, sensors, equipment; fabrication and prototyping processes to remove coolant and other residue from machine parts; machined part fabrications for naval systems; installation of topside rubber tile material aboard vessels; and vapor degreasing required for substrate surface preparation prior to electroplating processes;

(13) Industrial and commercial use of TCE as a solvent in closed-loop batch vapor degreasing necessary for rocket engine cleaning by Federal agencies and their contractors;

(14) Industrial and commercial use of TCE in batch vapor degreasing for land-based DoD defense systems by Federal agencies and their contractors; and

(15) Disposal of TCE to industrial pre-treatment, industrial treatment, or publicly owned treatment works, except to the extent that the activity is covered by the workplace protections in § 751.319.

(b) Interim existing chemical exposure limit (interim ECEL)—(1) Applicability. The provisions of this paragraph (b) apply to any workplace engaged in the conditions of use listed in paragraphs (a)(1) through (15) of this section.

(2) *Interim ECEL.* Beginning September 20, 2027 for Federal agencies and Federal contractors acting for or on behalf of the Federal government, or by September 15, 2025 for non-Federal owners and operators, or beginning 120 days after introduction of TCE into the workplace if TCE use commences after June 16, 2025, the owner or operator must ensure that no person is exposed to an airborne concentration of TCE in excess of the interim ECEL, consistent with the requirements of paragraph (c)

of this section and, if necessary, paragraph (e)(1) of this section.

(3) *Exposure monitoring*—(i) *General.* (A) Owners or operators must determine each potentially exposed person's exposure, without regard to respiratory protection, by either:

(*1*) Taking a personal breathing zone air sample of each potentially exposed person's exposure; or

(*2*) Taking personal breathing zone air samples that are representative of the 8-hour TWA of each exposure group.

(B) Personal breathing zone air samples are representative of the 8-hour TWA of all potentially exposed persons in an exposure group if the samples are of at least one person's work-shift exposure who represents the highest potential TCE exposures in that exposure group. Personal breathing zone air samples taken during one work shift may be used to represent potentially exposed person exposures on other work shifts where the owner or operator can document that the tasks performed and conditions in the workplace are similar across shifts.

(C) Exposure samples must be analyzed using an appropriate analytical method by a laboratory that complies with the Good Laboratory Practice Standards in 40 CFR part 792 or a laboratory accredited by the American Industrial Hygiene Association (AIHA) or another industry-recognized program.

(D) Owners or operators must ensure that methods used to perform exposure monitoring produce results that are accurate, to a confidence level of 95 percent, to within plus or minus 25 percent for airborne concentrations of TCE.

(E) Owners and operators must re-monitor within 15 working days after receipt of any exposure monitoring when results indicate non-detect unless an Environmental Professional as defined at 40 CFR 312.10 or a Certified Industrial Hygienist reviews the monitoring results and determines re-monitoring is not necessary.

(ii) *Initial monitoring.* By June 21, 2027 for Federal agencies and Federal contractors acting for or on behalf of the Federal government, or by June 16, 2025 for non-Federal owners and operators or within 30 days of introduction of TCE into the workplace, whichever is later, each owner or operator covered by this section must perform initial monitoring of potentially exposed persons. Where the owner or operator has monitoring results from monitoring conducted within five years prior to February 18, 2025 and the monitoring satisfies all other requirements of this section, the owner or operator may rely on such earlier monitoring results to satisfy the requirements of this paragraph.

(iii) *Periodic monitoring.* The owner or operator must establish an exposure monitoring program for periodic monitoring of exposure to TCE in accordance with Table 1.

TABLE 1 TO § 751.311(B)(3)(III)—PERIODIC MONITORING REQUIREMENTS

Air concentration condition	Periodic monitoring requirement
If initial exposure monitoring is below the interim ECEL action level (<0.1 ppm 8-hour TWA).	Periodic exposure monitoring is required at least once every five years.
If the most recent exposure monitoring indicates that airborne exposure is at or above the interim ECEL action level but at or below the interim ECEL (≥0.1 ppm 8-hour TWA, ≤0.2 ppm 8-hour TWA).	Periodic exposure monitoring is required within 180 days of the most recent exposure monitoring.
If the most recent exposure monitoring indicates that airborne exposure is above the interim ECEL (<0.2 ppm 8-hour TWA).	Periodic exposure monitoring is required within 90 days of the most recent exposure monitoring.
If the two most recent (non-initial) exposure monitoring measurements, taken at least seven days apart within a six-month period, indicate that airborne exposure is below the interim ECEL action level (<0.1 ppm 8-hour TWA).	Periodic exposure monitoring is required within five years of the most recent exposure monitoring.
If the owner or operator engages in a condition of use for which compliance with the WCPP is required but does not manufacture, process, use, or dispose of TCE in that condition of use over the entirety of time since the last required monitoring event.	The owner or operator may forgo the next periodic monitoring event. However, documentation of cessation of use of TCE is required; and periodic monitoring is required when the owner or operator resumes the condition of use.

(iv) *Additional monitoring.* (A) The owner or operator must conduct the exposure monitoring required by paragraph (b)(3)(ii) of this section within 30 days after there has been a change in the production, process, control equipment, personnel or work practices that may reasonably be expected to result in new or additional exposures above the interim ECEL action level or when the owner or operator has any reason to believe that new or additional exposures above the interim ECEL action level have occurred. Prior monitoring data cannot be used to meet this requirement.

(B) Whenever start-ups or shutdown, or spills, leaks, ruptures, or other breakdowns or unexpected releases occur that may lead to exposure to potentially exposed persons, the owner or operator must conduct the exposure monitoring required by paragraph (b)(3)(ii) of this section within 30 days after the conclusion of the start-up or shut down and/or the cleanup of the spill or repair of the leak, rupture, or other breakdown. Prior monitoring data cannot be used to meet this requirement.

(v) *Observation of monitoring.* (A) Owners and operators must provide potentially exposed persons or their designated representatives an opportunity to observe any monitoring of occupational exposure to TCE that is conducted under this section and designed to characterize their exposure.

(B) When monitoring observation requires entry into a regulated area, the owner or operator must provide the observers with the required PPE.

(C) Only persons who are authorized to have access to facilities classified in the interest of national security must be permitted to observe exposure monitoring conducted in such facilities.

(vi) *Notification of monitoring results.* (A) The owner or operator must inform each person whose exposures are monitored or who is part of a monitored exposure group, and their designated representative, of any monitoring results within 15 working days of receipt of those monitoring results.

(B) This notification must include the following:

(*1*) Exposure monitoring results;

(*2*) Identification and explanation of the interim ECEL and interim ECEL action level;

(*3*) Statement of whether the monitored airborne concentration of TCE exceeds the interim ECEL action level or interim ECEL;

(*4*) If the interim ECEL is exceeded, descriptions of any exposure controls implemented by the owner or operator

to reduce exposure to or below the interim ECEL;

(5) Explanation of any respiratory protection provided in accordance with paragraphs (b)(4) and I of this section;

(6) Quantity of TCE in use at the time of monitoring;

(7) Location(s) of TCE use at the time of monitoring;

(8) Manner of TCE use at the time of monitoring; and

(9) Identified releases of TCE.

(C) Notice must be written, in plain language, and either provided to each potentially exposed person individually in a language that the person understands, or posted in an appropriate and accessible location outside the regulated area with an English-language version and a non-English language version representing the language of the largest group of workers who do not read English.

(4) *Regulated areas*—(i) *Establishment.* By September 20, 2027 for Federal agencies and Federal contractors acting for or on behalf of the Federal government, or by September 15, 2025 for non-Federal owners and operators, or within 90 days after receipt of any exposure monitoring that indicates exposures exceeding the interim ECEL, the owner or operator must establish and maintain a regulated area wherever airborne concentrations of TCE exceed or can reasonably be expected to exceed the interim ECEL.

(ii) *Access.* The owner or operator must limit access to regulated areas to authorized persons.

(iii) *Demarcation.* The owner or operator must demarcate regulated areas from the rest of the workplace in a manner that adequately establishes and alerts persons to the boundaries of the area and minimizes the number of authorized persons exposed to TCE within the regulated area.

(iv) *Provision of respirators.* (A) The owner or operator must ensure that each person who enters a regulated area is supplied with a respirator selected in accordance with paragraph I(e) of this section and must ensure that all persons within the regulated area are using the provided respirators whenever TCE exposures may exceed the interim ECEL, except as provided in paragraph (B) of this section.

(B) An owner or operator who has implemented all feasible controls as required in paragraph (c)(1)(i) of this section, and who has established a regulated area as required by paragraphs (b)(4)(i) of this section where TCE exposure can be reliably predicted to exceed the interim ECEL only on certain days (for example, because of work or process schedule) must have persons use respirators in that regulated area on those days.

(v) *Prohibited activities.* (A) The owner or operator must ensure that, within a regulated area, persons do not engage in non-work activities which may increase TCE exposure.

(B) The owner or operator must ensure that while persons are wearing respirators in the regulated area, they do not engage in activities which interfere with respirator performance.

(c) *Interim ECEL control procedures and plan—(1) Methods of compliance.* (i) By December 17, 2027 for Federal agencies and Federal contractors acting for or on behalf of the Federal government, or by December 18, 2025, for non-Federal owners and operators, the owner or operator must institute one or a combination of elimination, substitution, engineering controls or administrative controls to reduce exposure to or below the interim ECEL except to the extent that the owner or operator can demonstrate that such controls are not feasible as an interim measure, in accordance with the hierarchy of controls.

(ii) If the feasible controls required under paragraph (c)(1)(i) of this section that can be instituted do not reduce exposures for potentially exposed persons to or below the interim ECEL, then the owner or operator must use such controls to reduce exposure to the lowest levels achievable by these controls and must supplement those controls by the use of respiratory protection that complies with the requirements of paragraph (e) of this section.

(iii) Where an owner or operator cannot demonstrate exposure to TCE has been reduced to or below the interim ECEL through the use of controls required under paragraphs (c)(1)(i) and (ii) of this section, and has not demonstrated that it has appropriately supplemented feasible exposure controls with respiratory protection that complies with the requirements of paragraph (e) of this section, this will constitute a failure to comply with the interim ECEL.

(2) *Exposure control plan.* By December 17, 2027 for Federal agencies and Federal contractors acting for or on behalf of the Federal government, or by December 18, 2025, for non-Federal owners and operators, each owner and operator must establish and implement an exposure control plan.

(i) *Exposure control plan contents.* The exposure control plan must include documentation of the following:

(A) Identification of exposure controls that were considered, including those that were used or not used to meet the requirements of paragraph (c)(1)(i) of this section, in the following sequence: elimination, substitution, engineering controls and administrative controls;

(B) For each exposure control considered, a rationale for why the exposure control was selected or not selected based on feasibility, effectiveness, and other relevant considerations;

(C) A description of actions the owner or operator must take to implement exposure controls selected, including proper installation, regular inspections, maintenance, training, or other actions;

(D) A description of each regulated area, how they are demarcated, and persons authorized to enter the regulated areas;

(E) Description of activities conducted by the owner or operator to review and update the exposure control plan to ensure effectiveness of the exposure controls, identify any necessary updates to the exposure controls, and confirm that all persons are properly implementing the exposure controls;

(F) An explanation of the procedures for responding to any change that may reasonably be expected to introduce additional sources of exposure to TCE, or otherwise result in increased exposure to TCE, including procedures for implementing corrective actions to mitigate exposure to TCE.

(ii) *Exposure control plan requirements.* (A) The owner or operator must not implement a schedule of personnel rotation as a means of compliance with the interim ECEL.

(B) The owner or operator must maintain the effectiveness of any controls instituted under this paragraph (c).

(C) The exposure control plan must be reviewed and updated as necessary, but at least every 5 years, to reflect any significant changes in the status of the owner or operator's approach to compliance with paragraphs (b) and (c) of this section.

(iii) *Availability of exposure control plan.* (A) Owners or operators must make the exposure control plan and associated records, including interim ECEL exposure monitoring records, interim ECEL compliance records, and workplace participation records available to potentially exposed persons and their designated representative.

(B) Owners or operators must notify potentially exposed persons and their designated representatives of the availability of the exposure control plan and associated records within 30 days of the date that the exposure control plan is completed and at least annually thereafter.

(C) Notice of the availability of the exposure control plan and associated records must be provided in plain language writing to each potentially exposed person in a language that the person understands or posted in an appropriate and accessible location outside the regulated area with an English-language version and a non-English language version representing the language of the largest group of workers who do not read English.

(D) Upon request by the potentially exposed person or their designated representative(s), the owner or operator must provide the specified records at a reasonable time, place, and manner. If the owner or operator is unable to provide the requested records within 15 working days, the owner or operator must, within those 15 working days, inform the potentially exposed person or designated representative(s) requesting the record(s) of the reason for the delay and the earliest date when the record will be made available.

(d) *Workplace information and training.* (1) By September 20, 2027 for Federal agencies and Federal contractors acting for or on behalf of the Federal government, or by September 15, 2025 for non-Federal owners and operators, the owner or operator must institute a training program and ensure that persons potentially exposed to TCE participate in the program according to the requirements of this paragraph (d).

(2) The owner or operator must ensure that each potentially exposed person is trained prior to or at the time of initial assignment to a job involving potential exposure to TCE.

(3) The owner or operator must ensure that information and training is presented in a manner that is understandable to each person required to be trained.

(4) The following information and training must be provided to all persons potentially exposed to TCE:

(i) The requirements of this section, as well as how to access or obtain a copy of these requirements in the workplace;

(ii) The quantity, location, manner of use, release, and storage of TCE and the specific operations in the workplace that could result in exposure to TCE, particularly noting where each regulated area is located;

(iii) Methods and observations that may be used to detect the presence or release of TCE in the workplace (such as monitoring conducted by the owner or operator, continuous monitoring devices, visual appearance, or odor of TCE when being released);

(iv) The acute and chronic health hazards of TCE as detailed on relevant Safety Data Sheets; and

(v) The principles of safe use and handling of TCE and measures potentially exposed persons can take to protect themselves from TCE, including specific procedures the owner or operator has implemented to protect potentially exposed persons from exposure to TCE, such as appropriate work practices, emergency procedures, and personal protective equipment to be used.

(5) The owner or operator must re-train each potentially exposed person annually to ensure that each such person maintains the requisite understanding of the principles of safe use and handling of TCE in the workplace.

(6) Whenever there are workplace changes, such as modifications of tasks or procedures or the institution of new tasks or procedures, that increase exposure, and where those exposures exceed or can reasonably be expected to exceed the interim ECEL action level, the owner or operator must update the training and ensure that each potentially exposed person is re-trained.

(e) *Personal protective equipment (PPE)—(1) Respiratory protection.* (i) By September 20, 2027 for Federal agencies and Federal contractors acting for or on behalf of the Federal government, or by September 15, 2025 for non-Federal owners and operators, or within 90 days after receipt of any exposure monitoring that indicates exposures exceeding the interim ECEL, or, if an owner or operator is required to provide respiratory protection pursuant to paragraphs (b)(4)(iv) and (c)(1)(ii) of this section, the owner or operator must ensure that each potentially exposed person is provided with a respirator according to the requirements of this section.

(ii) For purposes of this paragraph (e)(1) of this section, cross-referenced provisions in 29 CFR 1910.134 applying to an "employee" apply equally to potentially exposed persons and cross-referenced provisions applying to an "employer" also apply equally to owners or operators. Other terms in cross-referenced provisions in 29 CFR 1910.134 that are defined in 29 CFR 1910.134(b) have the meaning assigned to them in that paragraph.

(iii) By September 20, 2027 for Federal agencies and Federal contractors acting for or on behalf of the Federal government, or by September 15, 2025 for non-Federal owners and operators, or within 90 days after receipt of any exposure monitoring that indicates exposures exceeding the interim ECEL, if an owner or operator is required to provide respiratory protection pursuant to paragraph (b)(4)(iv) or (c)(1)(ii), the owner or operator must develop and administer a written respiratory protection program consistent with the requirements of 29 CFR 1910.134(c)(1), (c)(3) and (c)(4).

(iv) Owners and operators must select respiratory protection based on a medical evaluation consistent with the requirements of 29 CFR 1910.134(e). If a potentially exposed person cannot use a negative-pressure respirator that would otherwise be required, then the owner or operator must provide that person with an alternative respirator. The alternative respirator must have less breathing resistance than the negative-pressure respirator and provide equivalent or greater protection. If the person is unable to use an alternative respirator, then the person must not be permitted to enter the regulated area.

(v) Owners and operators must select respiratory protection that properly fits each affected person and communicate respirator selections to each affected person consistent with the requirements of 29 CFR 1910.134(f).

(vi) Owners and operators must provide, ensure use of, and maintain (in a sanitary, reliable, and undamaged condition) respiratory protection that is of safe design and construction for the applicable condition of use consistent with the requirements of 29 CFR 1910.134(g) through (j).

(vii) Prior to or at the time of initial assignment to a job involving potential exposure to TCE, owners and operators must provide training to all persons required to use respiratory protection consistent with 29 CFR 1910.134(k).

(viii) Owners and operators must retrain all persons required to use PPE at least annually, or whenever the owner or operator has reason to believe that a previously trained person does not have the required understanding and skill to properly use PPE, or when changes in the workplace or in PPE to be used render the previous training obsolete.

(ix) Owners or operators must select and provide to persons appropriate respirators as indicated by the most recent monitoring results as follows:

(A) If the measured exposure concentration is at or below 0.2 ppm (200 ppb): no respiratory protection is required.

(B) If the measured exposure concentration is above 0.2 ppm (200 ppb) and less than or equal to 2 ppm (2,000 ppb) (10 times interim ECEL): Any National Institute for Occupational Safety and Health (NIOSH) Approved air-purifying half mask respirator equipped with organic vapor cartridges or canisters; or any NIOSH Approved Supplied-Air Respirator (SAR) or

Airline Respirator operated in demand mode equipped with a half mask; or any NIOSH Approved Self-Contained Breathing Apparatus (SCBA) in a demand mode equipped with a half mask [APF 10].

(C) If the measured exposure concentration is above 2 ppm and less than or equal to 5 ppm (25 times interim ECEL): Any NIOSH Approved Powered Air-Purifying Respirator (PAPR) equipped with a loose-fitting facepiece or hood/helmet equipped with organic vapor cartridges or canisters; or any NIOSH Approved SAR or Airline Respirator in a continuous-flow mode equipped with a loose-fitting facepiece or helmet/hood [APF 25].

(D) If the measured exposure concentration is above 5 ppm and less than or equal to 10 ppm (50 times interim ECEL): Any NIOSH Approved air-purifying full facepiece respirator equipped with organic vapor cartridges or canisters; any NIOSH Approved PAPR with a half mask equipped with organic vapor cartridges or canisters; any NIOSH Approved SAR or Airline Respirator in a continuous flow mode equipped with a half mask; any NIOSH Approved SAR or Airline Respirator operated in a pressure-demand or other positive-pressure mode with a half mask; or any NIOSH Approved SCBA in demand-mode equipped with a full facepiece or helmet/hood [APF 50].

(E) If the measured exposure concentration is above 10 ppm and less than or equal to 200 ppm (1,000 times interim ECEL): Any NIOSH Approved PAPR equipped with a full facepiece equipped with organic vapor cartridges or canisters; any NIOSH Approved SAR or Airline Respirator in a continuous-flow mode equipped with full facepiece; any NIOSH Approved SAR or Airline Respirator in pressure-demand or other positive-pressure mode equipped with a full facepiece and an auxiliary self-contained air supply; or any NIOSH Approved SAR or Airline Respirator in a continuous-flow mode equipped with a helmet or hood and that has been tested to demonstrated performance at a level of a protection of APF 1,000 or greater [APF 1000].

(F) If the measured exposure concentration is greater than 200 ppm (1,000+ times interim ECEL): Any NIOSH Approved SCBA equipped with a full facepiece or hood/helmet and operated in a pressure demand or other positive pressure mode; air supply [APF 10,000+].

(G) If the exposure concentration is unknown: Any NIOSH Approved combination SAR equipped with a full facepiece and operated in pressure demand or other positive pressure mode with an auxiliary self-contained air supply; or any NIOSH Approved SCBA operated in pressure demand or other positive pressure mode and equipped with a full facepiece or hood/helmet [APF 1000+].

(x) Owners and operators must select and provide respirators consistent with the requirements of 29 CFR 1910.134(d)(1)(iv), and with consideration of workplace and user factors that affect respirator performance and reliability.

(xi) Owners and operators who select air-purifying respirators must either:

(A) Select NIOSH Approved respirators that have an end-of-service-life indicator (ESLI) appropriate for TCE; or

(B) Implement a change schedule for canisters and cartridges based on objective information or data that ensures that canisters and cartridges are changed before the end of their service life. The written respiratory protection program required by paragraph (e)(1)(iii) of this section must include a description of the information and data relied upon, the basis for reliance on the information and data, and the basis for the canister and cartridge change schedule.

(xii) Owners and operators must, consistent with 29 CFR 1910.134(j), ensure that all respirator filters, cartridges, and canisters used in the workplace are labeled and color coded per NIOSH requirements and that the label is not removed and remains legible.

(xiii) Owners and operators must ensure that respirators are used in compliance with the terms of the respirator's NIOSH approval.

(xiv) Owners and operators must conduct regular evaluations of the workplace, including consultations with potentially exposed persons using respiratory protection, consistent with the requirements of 29 CFR 1910.134(l), to ensure that the provisions of the written respiratory protection program required under paragraph (e)(1)(iii) of this section are being effectively implemented.

(xv) The respiratory protection requirements in this paragraph represent the minimum respiratory protection requirements, such that any respirator affording a higher degree of protection than the required respirator may be used.

(2) *Dermal protection.* (i) By September 20, 2027 for Federal agencies and Federal contractors acting for or on behalf of the Federal government, or by September 15, 2025 for non-Federal owners and operators, owners and operators must supply and require the donning of gloves by potentially exposed persons that are chemically resistant to TCE where dermal exposure to TCE can be expected to occur, after application of the requirements in paragraph (c) of this section, in accordance with the hierarchy of controls.

(ii) Owners and operators must provide gloves that are of safe design and construction for the work to be performed and that properly fit each person who is required to use gloves.

(iii) Owners and operators must communicate glove selections to each affected person and ensure that each person who is required to wear gloves uses and maintains them in a sanitary, reliable, and undamaged condition.

(iv) Owners and operators must provide activity-specific dermal PPE training in accordance with 29 CFR 1910.132(f) to all persons required to use gloves prior to or at the time of initial assignment to a job involving potential dermal exposure to TCE. For the purposes of this paragraph (e)(4)(iv), provisions in 29 CFR 1910.132(f) applying to an "employee" also apply equally to potentially exposed persons, and provisions applying to an "employer" also apply equally to owners or operators.

(v) Owners and operators must retrain each person required to use gloves annually or whenever the owner or operator has reason to believe that a previously trained person does not have the required understanding and skill to properly use the gloves, or when changes in the workplace or in PPE to be used render the previous training obsolete.

§ 751.317 Workplace requirements for energized electrical cleaner.

(a) *Applicability.* The provisions of this section apply to the industrial and commercial use of TCE in energized electrical cleaner.

(b) *Energized electrical cleaner requirements—(1) Personal Protective Equipment (PPE).* (i) The provisions of this paragraph (b) apply after September 15, 2025.

(ii) Owners or operators must ensure that all potentially exposed persons using TCE, including any TCE-containing products, are provided with dermal PPE and training on proper use of PPE as outlined in § 751.315(e)(2).

(iii) Owners or operators must ensure that all persons using TCE, including any TCE containing products, are provided with respiratory PPE and training on proper use of PPE in accordance with § 751.315(e)(1), except that instead of selecting appropriate respirators based on monitoring results

pursuant to paragraph (e)(1)(ix), owners or operators must select from and provide the following types of respirators: any NIOSH Approved air-purifying full facepiece respirator equipped with organic vapor cartridges or canisters; any NIOSH Approved Powered Air-Purifying Respirator (PAPR) with a half mask equipped with organic vapor cartridges or canisters; any NIOSH Approved Supplied-Air Respirator (SAR) or Airline Respirator in a continuous flow mode equipped with a half mask; any NIOSH Approved Supplied-Air Respirator (SAR) or Airline Respirator operated in a pressure-demand or other positive-pressure mode with a half mask; any NIOSH Approved SCBA in demand-mode equipped with a full facepiece or helmet/hood [APF 50]; or any respirator affording a higher degree of protection.

(2) *Alternative to PPE Requirements.* (i) As an alternative to the requirements in paragraph (b)(1) of this section, the owner or operator may choose to follow the Workplace Chemical Protection Program (WCPP) provisions in § 751.315.

(ii) Owners or operators who choose to follow the WCPP as an alternative to the requirements in paragraph (b)(1) of this section must:

(A) Document and maintain a statement that they are electing to comply with the WCPP.

(B) Comply with the WCPP provisions in § 751.315 and document compliance in accordance with § 751.323(b).

§ 751.319 Workplace requirements for wastewater.

(a) Applicability. The provisions of this section apply to the following disposal sub-conditions of use for their respective phaseouts, in accordance with § 751.305 (b) (14), (23), (24), and (26):

(1) Cleanup of sites with TCE water contamination; and,

(2) Publicly owned treatment works.

(b) Cleanup sites. Beginning September 15, 2025 the owner or operator of the location where potentially exposed persons are involved in the disposal of TCE to industrial pre-treatment, industrial treatment, or publicly owned treatment works for the purposes of facilitating cleanup projects of TCE-contaminated water and groundwater must ensure that potentially exposed persons involved with the activity of removing the TCE-contaminated water and groundwater from the location where it was located and treating the removed TCE-contaminated water and groundwater on site are protected to the interim ECEL level of 0.2 ppm and protected from dermal contact with TCE-containing wastewater in accordance with the following requirements. For the purposes of this paragraph (b) of this section, cross-referenced provisions in 29 CFR 1910.120 applying to an "employee" apply equally to potentially exposed persons and cross-referenced provisions applying to an "employer" also apply equally to owners or operators.

(1) *Written site-specific safety and health plan.* Owners and operators must have a site-specific safety and health plan that addresses the health hazards presented by TCE to potentially exposed persons involved in the disposal of TCE-containing wastewater and that contains elements consistent with 29 CFR 1910.120(b)(4)(ii)(A), (B), (C), (E) and (F).

(2) *Training.* Owners and operators must provide training consistent with § 751.315(d) to potentially exposed persons prior to or at the time of initial assignment to a cleanup site job that involves the disposal of TCE-containing wastewater.

(3) *Engineering controls, work practices and PPE.* Engineering controls, work practices, and, if necessary, PPE must be implemented and provided in compliance with 40 CFR 751.315(c)(1) and (e).

(4) *Exposure monitoring.* (i) By September 15, 2025 or upon initial entry to a cleanup site, whichever is later, owners and operators must perform representative air monitoring consistent with 29 CFR 1910.120(h)(2) to identify any exposures to airborne TCE above the interim ECEL.

(ii) Owners and operators must perform periodic air monitoring consistent with 29 CFR 1910.120(h)(3) when there is any indication that exposures may have exceeded the interim ECEL since prior monitoring.

(iii) Owners and operators must monitor the exposures of those persons likely to have the highest exposures to airborne TCE above the interim ECEL by using personal air sampling frequently enough to characterize their exposures consistent with 29 CFR 1910.120(h)(4).

(iv) Owners and operators must perform exposure monitoring at least once every five years.

(c) Publicly owned treatment works. By September 15, 2025 owners or operators of publicly owned treatment works, where there is a reasonable possibility of the presence of TCE, must comply with one of the following:

(1) *Water screening level.* (i) Screen industrial wastewater discharge received at publicly owned treatment works by sampling and analyzing for a water concentration of TCE.

(ii) If the TCE concentration in wastewater exceeds 0.00284 mg/L of TCE, owners or operators must comply with the Workplace Chemical Protection Program provisions in § 751.315, except for the initial monitoring requirements in paragraph § 751.315(b)(3)(ii).

(2) *Alternative to water screening level.* (i) As an alternative to the requirements in paragraph (1) of this section, the owner or operator may choose to follow the Workplace Chemical Protection Program (WCPP) provisions in § 751.315.

(ii) Owners or operators who choose to follow the WCPP as an alternative to the requirements in paragraph (1) of this section must comply with the WCPP provisions in § 751.315 and document compliance in accordance with § 751.323(b).

§ 751.321 Downstream notification.

(a) Beginning on February 18, 2025, each person who manufactures (including imports) TCE for any use must, prior to or concurrent with the shipment, notify companies to whom TCE is shipped, in writing, of the restrictions described in this subpart in accordance with paragraph (c) of this section.

(b) Beginning on June 16, 2025, each person who processes or distributes in commerce TCE or any TCE-containing products for any use must, prior to or concurrent with the shipment, notify companies to whom TCE is shipped, in writing, of the restrictions described in this subpart in accordance with paragraph (c) of this section.

(c) The notification required under paragraphs (a) and (b) of this section must occur by inserting the following text in section 1(c) and 15 of the Safety Data Sheet (SDS) provided with the TCE or with any TCE-containing product:

After June 16, 2025, this chemical/product is and can only be domestically manufactured, imported, processed, or distributed in commerce for the following purposes until the following prohibitions take effect: (1) Processing as an intermediate a) for the manufacture of HFC–134a until June 18, 2033, and b) for all other processing as a reactant/intermediate until December 18, 2026; (2) Industrial and commercial use as a solvent for open-top batch vapor degreasing until December 18, 2025; (3) Industrial and commercial use as a solvent for closed-loop batch vapor degreasing until December 18, 2025, except for industrial and commercial use in batch vapor degreasing for land-based DoD defense systems by Federal agencies and their contractors until December 18, 2029, and except for industrial and commercial use as a solvent for closed-loop batch vapor degreasing necessary for rocket engine cleaning by Federal agencies and their contractors until December 18, 2031, and except for industrial and commercial use of

TCE in closed-loop and open-top batch vapor degreasing for essential aerospace parts and components and narrow tubing used in medical devices until December 18, 2031, and except for industrial and commercial use as a solvent for closed-loop batch vapor degreasing for rayon fabric scouring for end use in rocket booster nozzle production by Federal agencies and their contractors until December 18, 2034; (4) Industrial and commercial use in processing aid (a) for lithium battery separator manufacturing until December 18, 2029, and (b) for lead-acid battery separator manufacturing until December 18, 2044, and (c) for specialty polymeric microporous sheet material manufacturing until December 18, 2039, and (d) in process solvent used in battery manufacture; in process solvent used in polymer fiber spinning, fluoroelastomer manufacture and Alcantara manufacture; in extraction solvent used in caprolactam manufacture; and in precipitant used in beta-cyclodextrin manufacture until December 18, 2026; (5) Industrial and commercial uses for vessels of the Armed Forces and their systems, and in the maintenance, fabrication, and sustainment for and of such vessels and systems until December 18, 2034; and (6) Industrial and commercial use for laboratory use (a) for essential laboratory activities until December 18, 2074 and (b) for asphalt testing and recovery using manual centrifuge processes until December 18, 2029 and for asphalt testing and recovery until December 18, 2034.

§ 751.323 Recordkeeping requirements.

(a) General records. After February 18, 2025, all persons who manufacture, process, distribute in commerce, or engage in industrial or commercial use of TCE or TCE-containing products must maintain ordinary business records, such as invoices and bills-of-lading related to compliance with the prohibitions, restrictions, and other provisions of this subpart.

(b) Workplace chemical protection program compliance. (1) Interim ECEL exposure monitoring. For each monitoring event, owners or operators subject to the interim ECEL described in § 751.315(b) must document the following:

(i) Dates, duration, and results of each sample taken;

(ii) The quantity, location(s), and manner of TCE in use at the time of each monitoring event;

(iii) All measurements that may be necessary to determine the conditions that may affect the monitoring results;

(iv) Name, workplace address, work shift, job classification, work area, and type of respiratory protection (if any) by each monitored person;

(v) Identification of all potentially exposed persons that a monitored person is intended to represent if using a representative sample, consistent with § 751.315(b)(3)(i)(A) and (B);

(vi) Sampling and analytical methods used as described in § 751.315(b)(3)(i)(D);

(vii) Compliance with the Good Laboratory Practice Standards in accordance with 40 CFR part 792, or use of a laboratory accredited by the AIHA or another industry-recognized program as required by § 751.315(b)(3)(i)(C);

(viii) Information regarding air monitoring equipment, including: type, maintenance, calibrations, performance tests, limits of detection, and any malfunctions;

(ix) Re-monitoring determinations conducted by an Environmental Professional as defined at 40 CFR 312.10 or a Certified Industrial Hygienist, if results indicated non-detect; and

(x) Notification of exposure monitoring results in accordance with § 751.315(b)(3)(vi).

(2) *Interim ECEL compliance.* Owners or operators subject to the interim ECEL described in § 751.315(b) must retain records of:

(i) Exposure control plan as described in § 751.315(c)(2).

(ii) Implementation of the exposure control plan described in § 751.315(c)(2), including:

(A) Any regular inspections, evaluations, and updating of the exposure controls to maintain effectiveness;

(B) Confirmation that all persons are implementing the exposure controls; and

(C) Each occurrence and duration of any start-up, shutdown, or malfunction of the facility that causes an exceedance of the interim ECEL and any subsequent corrective actions taken by the owner or operator during the start-up, shutdown, or malfunctions to mitigate exposures to TCE.

(iii) Respiratory protection used by each potentially exposed person and PPE program implementation as described in § 751.315(e), including:

(A) The name, workplace address, work shift, job classification, and work area of each potentially exposed person, and the type of respiratory protection provided to each potentially exposed person;

(B) The basis for the specific PPE selection in accordance with § 751.315(c); and

(C) Fit testing and training in accordance with § 751.315(e).

(iv) Information and training provided as required in § 751.315(d).

(3) *Workplace participation.* Owners or operators must document the notice to and ability of any potentially exposed person who may reasonably be affected by TCE inhalation exposure and their designated representative to readily access the exposure control plans, facility exposure monitoring records, PPE program implementation records, or any other information relevant to TCE exposure in the workplace.

(c) *Records related to exemptions.* To maintain eligibility for an exemption described in § 751.325, owners or operators must maintain records related to, and demonstrating compliance with, the specific conditions of the exemption.

(d) *Records related to phase-outs.* (1) Beginning February 18, 2025, each manufacturer of HFC–134a who uses TCE as an intermediate under § 751.307 must maintain records of the annual quantity of TCE purchased and processed until the termination of all processing of TCE as an intermediate and, beginning June 16, 2025, must maintain records that demonstrate how the baseline annual volume was calculated, in accordance with § 751.307(a)(1).

(2) Beginning September 15, 2025, each person using TCE under § 751.309 for industrial and commercial use as a solvent for closed-loop batch vapor degreasing for rayon fabric scouring for end use in rocket booster nozzle production by Federal agencies and their contractors must maintain records demonstrating that the end use is in rocket booster nozzle production for Federal agencies and their contractors.

(3) Beginning September 15, 2025, each person using TCE under § 751.311 for industrial and commercial use in laboratory use for asphalt testing and recovery must maintain records demonstrating compliance with the use of TCE as specified in § 751.311.

(4) After December 18, 2029, each person using TCE under § 751.311 for industrial and commercial use in laboratory use for asphalt testing and recovery must maintain records demonstrating compliance with the provision in § 751.311 that the use of TCE in laboratory use for asphalt testing and recovery be in methods that do not include manual centrifuge processes.

(5) After December 18, 2029, each person using TCE under § 751.309 for industrial and commercial use as a solvent for closed-loop batch vapor degreasing, specifically for rayon fabric scouring, must maintain records that demonstrate that a final pre-launch test of rocket booster nozzles without using TCE was completed.

(e) *Records related to workplace requirements for energized electrical cleaner.* (1) Owners and operators subject to the energized electrical cleaner requirements described in § 751.317 must retain records of:

(i) Statement regarding whether the owner or operator is complying with the prescriptive PPE requirements described in § 751.317(b)(1) or with the WCPP described in § 751.317(b)(2).

(ii) Dermal and respiratory protection used by each potentially exposed person and program implementation as described in § 751.317(b)(1) or WCPP records described in § 751.323(b).

(2) Distributors of TCE, including TCE containing products, for use in energized electrical cleaning must retain sale records, including:

(i) Name of purchaser;

(ii) Date of sale; and

(iii) Quantity of TCE or TCE containing products sold.

(f) *Records related to wastewater workplace protection requirements.* (1) Owners and operators subject to the wastewater workplace protection requirements for cleanup sites described in § 751.319 must retain records related to and demonstrating compliance with the provisions of § 751.319 and 29 CFR 1910.120 that are applicable to the particular site and records related to and demonstrating compliance with the interim ECEL.

(2) Publicly owned treatment works must retain records related to and demonstrating compliance with the wastewater screening and other requirements described in § 751.319, and if applicable must retain records for the WCPP as described in § 751.323(b).

(g) Minimum record retention periods. The records required under this section must be retained for at least 5 years from the date that such records were generated, except for the records required under paragraph (d)(1), which must be retained for at least 5 years after the use of TCE covered by the records has ceased.

§ 751.325 Exemptions.

(a) *In general.* (1) The time-limited exemptions described in this section are established in accordance with 15 U.S.C. 2605(g).

(2) In order to be eligible for the exemptions described in this section, regulated parties must comply with all conditions established for such exemptions in this section.

(b) *Exemptions—(1) Closed-loop batch vapor degreasing necessary for rocket engine cleaning by Federal agencies and their contractors until December 18, 2031.* The following are specific conditions of the exemption for industrial and commercial use of TCE as a solvent for closed-loop vapor degreasing necessary for rocket engine cleaning by Federal agencies and their contractors described in § 751.305(b)(15):

(i) The use of TCE in industrial and commercial as a solvent for closed-loop vapor degreasing is limited to the closed-loop batch vapor degreasing necessary for rocket engine cleaning by Federal agencies and their contractors.

(ii) The owner or operator of the location where such use occurs, and manufacturers (including importers) and processors of TCE for such use, must comply with the Workplace Chemical Protection Program provisions in § 751.315.

(iii) The owner or operator of the location where such use of TCE occurs, and manufacturers (including importers) and processors of TCE for such use, must comply with the recordkeeping requirements in § 751.323.

(2) *Closed-loop and Open-top batch vapor degreasing for essential aerospace parts and components and narrow tubing for medical devices until December 18, 2031.* The following are specific conditions of the exemption for vapor degreasing described in § 751.305(b)(16):

(i) The use of TCE for closed-loop and open-top batch vapor degreasing is limited to the cleaning of:

(A) Essential aerospace parts and components where cleaning alternatives present technical feasibility or performance challenges to meet specifications from Federal agencies or other long-standing design specifications included in existing contracts; and

(B) Narrow tubing for medical devices.

(ii) The owner or operator of the location where such use of TCE occurs, and manufacturers (including importers) and processors of TCE for such use, must comply with the Workplace Chemical Protection Program provisions in § 751.315.

(iii) The owner or operator of the location where such use of TCE occurs must comply with the recordkeeping requirements in § 751.323.

(3) *Certain industrial and commercial uses of TCE for vessels of the Armed Forces and their systems, and in the maintenance, fabrication, and sustainment for and of such vessels and systems until December 18, 2034.* The following are specific conditions of the exemption for industrial and commercial uses of TCE for vessels of the Armed Forces and their systems, and in the maintenance, fabrication, and sustainment for and of such vessels and systems described in § 751.305(b)(20):

(i) The industrial and commercial use of TCE must be limited for vessels of the Armed Forces and their systems, and in the maintenance, fabrication, and sustainment for and of such vessels and systems: as potting compounds for naval electronic systems and equipment; sealing compounds for high and ultra-high vacuum systems; bonding compounds for materials testing and maintenance of underwater systems and bonding of nonmetallic materials; and cleaning agents to satisfy cleaning requirements (which includes degreasing using wipes, sprays, solvents and vapor degreasing) for: materials and components required for military ordnance testing; temporary resin repairs in vessel spaces where welding is not authorized; ensuring polyurethane adhesion for electronic systems and equipment repair and installation of elastomeric materials; various naval combat systems, radars, sensors, equipment; fabrication and prototyping processes to remove coolant and other residue from machine parts; machined part fabrications for naval systems; installation of topside rubber tile material aboard vessels; and vapor degreasing required for substrate surface preparation prior to electroplating processes.

(ii) The owner or operator of the location where such use occurs, and manufacturers (including importers) and processors of TCE for such use, must comply with the Workplace Chemical Protection Program provisions in § 751.315.

(iii) The owner or operator of the location where such use of TCE occurs must comply with the recordkeeping requirements in § 751.323.

(4) *Use of TCE or TCE-containing products in an emergency by the National Aeronautics and Space Administration and its contractors operating within the scope of their contracted work until December 18, 2034*—(i) *Applicability.* This exemption shall apply to the following specific conditions of use:

(A) Industrial and commercial use as solvent for open-top or closed-loop batch vapor degreasing.

(B) Industrial and commercial use as solvent for cold cleaning.

(C) Industrial and commercial use as a solvent for aerosol spray degreaser/cleaner and mold release.

(D) Industrial and commercial use as a lubricant and grease in tap and die fluid.

(E) Industrial and commercial use as a lubricant and grease in penetrating lubricant.

(F) Industrial and commercial use as an adhesive and sealant in solvent-based adhesives. and sealants.

(G) Industrial and commercial as a functional fluid in heat exchange fluid.

(H) Industrial and commercial use in corrosion inhibitors and anti-scaling agents.

(I) Industrial and commercial use of TCE as a processing aid.

(J) Manufacturing (including importing) and processing of TCE for the industrial and commercial uses listed in paragraphs (b)(4)(i)(A) through (I) of this section.

(ii) *Emergency use.* (A) *In general.* An emergency is a serious and sudden situation requiring immediate action, within 15 days or less, necessary to protect:

(*1*) Safety of NASA's or their contractors' personnel;

(*2*) NASA's missions;

(*3*) Human health, safety, or property, including that of adjacent communities; or

(*4*) The environment.

(B) *Duration.* Each emergency is a separate situation; if use of TCE exceeds 15 days, then justification must be documented.

(iii) *Eligibility.* To be eligible for the exemption, the NASA and its contractors must:

(A) Select TCE because there are no technically and economically feasible safer alternatives available during the emergency.

(B) Perform the emergency use of TCE at locations controlled by NASA or its contractors.

(C) Comply with the following conditions:

(1) Notification. Within 15 working days of the emergency use by NASA and its contractors, NASA must provide notice to the EPA Assistant Administrators of both the Office of Enforcement and Compliance Assurance and the Office of Chemical Safety and Pollution Prevention that includes the following:

(*i*) Identification of the conditions of use detailed in paragraph (b)(4)(i) of this section that the emergency use fell under;

(*ii*) An explanation for why the emergency use met the definition of emergency in paragraph (b)(4)(i)(B) of this section; and

(*iii*) An explanation of why TCE was selected, including why there were no technically and economically feasible safer alternatives available in the particular emergency.

(2) Exposure control. The owner or operator must comply with the Workplace Chemical Protection Program provisions in § 751.315, to the extent technically feasible in light of the particular emergency.

(3) Recordkeeping. The owner or operator of the location where the use takes place must comply with the recordkeeping requirements in § 751.323.

(5) *Lead-acid battery separator manufacturing until* December 18, 2044. The following are specific conditions of the exemption for use as a processing aid in the manufacturing of lead-acid battery separators described in § 751.305(b)(22):

(i) The use of TCE as a processing aid for battery separator manufacturing must be limited to lead acid battery separator manufacturing.

(ii) This specific industrial and commercial use of TCE as a processing aid can only be used at industrial facilities in which TCE is in use for the manufacture of lead acid battery separators prior to February 18, 2025.

(iii) The owner or operator of the location where such use occurs, and manufacturers (including importers) and processors of TCE for such use, must comply with the Workplace Chemical Protection Program provisions in § 751.315.

(iv) The owner or operator of the location where such use of TCE occurs must comply with the recordkeeping requirements in § 751.323.

(6) *Industrial and commercial use of TCE as a processing aid for specialty polymeric microporous sheet materials manufacturing until* December 18, 2039. The following are specific conditions of the exemption for industrial and commercial use as a processing aid at § 751.305(b)(23):

(i) The use of TCE as a processing aid must be limited to specialty polymeric microporous sheet materials manufacturing.

(ii) This specific industrial and commercial use of TCE as a processing aid can only be used at industrial facilities in which TCE is in use for the manufacture of specialty polymeric microporous sheet materials prior to February 18, 2025.

(iii) The owner or operator of the location where such use occurs, and manufacturers (including importers) and processors of TCE for such use, must comply with the Workplace Chemical Protection Program provisions in § 751.315.

(iv) The owner or operator of the location where such use of TCE occurs must comply with the recordkeeping requirements in § 751.323.

(7) *Laboratory use for essential laboratory activities until December 18, 2074.* The following are specific conditions of the exemption for laboratory use at § 751.305(b)(24):

(i) The industrial and commercial use of TCE as a laboratory chemical must only be for essential laboratory activities. Essential laboratory activities are:

(A) Laboratory activities associated with cleanup and exposure monitoring activities, including chemical analysis, chemical synthesis, extracting or purifying other chemicals, dissolving other substances, research and development for the advancement of cleanup activities, and as an analytical standard for monitoring related to TCE contamination or exposure monitoring.

(B) Laboratory activities conducted by Federal agencies and their contractors, other than those described in paragraph (b)(7)(i)(A) of this section, and similar laboratory activities, provided the use is essential to the agency's mission.

(ii) The use of TCE as a laboratory chemical for testing asphalt is regulated under § 751.311, and is not considered an essential laboratory activity.

(iii) The use of TCE as a laboratory chemical must be performed on the premises of a laboratory.

(iv) The owner or operator of the location where such use of TCE occurs, and manufacturers (including importers) and processors of TCE for such use, must comply with the Workplace Chemical Protection Program provisions in § 751.315.

(v) The owner or operator of the location where such use of TCE occurs must comply with the recordkeeping requirements in § 751.323.

(8) *Disposal of TCE to industrial pre-treatment, industrial treatment, or publicly owned treatment works for the purposes of cleanup projects of TCE-contaminated water and groundwater until December 18, 2074.* The following are specific conditions of the exemption for disposal at § 751.305(b)(25):

(i) The disposal of TCE to industrial pre-treatment, industrial treatment, or publicly owned treatment works must only be for the purposes of cleanup projects of TCE-contaminated water and groundwater, and is limited to sites undergoing cleanup under CERCLA, RCRA, or other Federal, state, and local government laws, regulations, or requirements.

(ii) The owner or operator of the cleanup site location where TCE industrial treatment or pretreatment occurs must comply with the wastewater worker protection requirements in § 751.319.

(iii) The owner or operator of publicly owned treatment works that receive TCE wastewater must comply with the worker protection requirements in § 751.319.

(iv) The owner or operator of the location where such disposal of TCE occurs must comply with the recordkeeping requirements in § 751.323.

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