Q & A on USEPA's Proposal to Ban Asbestos Diaphragm Use Under TSCA

Background: One of the most abundant naturally occurring elements, chlorine is a building block chemical in the manufacture of hundreds of life-enhancing products, including pharmaceuticals, smartphones and other electronics, cosmetics, fertilizers and detergents. Chlorine and its derivatives are also essential in maintaining a safe drinking water supply in the United States and around the world. In fact, the U.S. Environmental Protection Agency (USEPA) requires a chlorine residual of 0.5 ppm to ensure drinking water is safe.

Chlorine and sodium hydroxide are produced through a chemical reaction using salt, water, and electricity. One of the processes to separate the chlorine molecules from sodium hydroxide and hydrogen involves flowing the molecules through a membrane or diaphragm. Today, nearly one-third of the chlorine manufactured in the U.S. is produced using diaphragms containing chrysotile asbestos. This form of asbestos has been safely and narrowly used for this purpose for decades. Throughout the process, engineering technologies, management practices and personal protective equipment (PPE) are utilized in compliance with federal and state regulations to ensure personnel and the environment are well protected.

As part of its review under the Toxic Substances Control Act (TSCA), USEPA determined the use of asbestos diaphragms in the chlor-alkali industry presents an unreasonable risk, but only when assuming worst-case (so called "high-end") exposures to workers that do not reflect actual conditions in these facilities. Still, the Agency has proposed to prohibit the use of chrysotile asbestos in the production of chlorine and sodium hydroxide within two years of the effective date of the final rule. The elimination of one-third of the production capacity of these two critical building block materials over such a short period of time would result in significant disruption of the supply of these materials.

Is asbestos use widespread? Wasn't it banned many years ago?
Although USEPA has prohibited the use of asbestos in many applications, it is still used in a limited number of applications where its unique properties provide significant benefits. Among these uses is the use of chrysotile asbestos in diaphragms for the production of chlorine and sodium hydroxide where the potential for exposure is carefully controlled.

Would the phase-out of chrysotile asbestos use in diaphragms for the production of chlorine and sodium hydroxide result in a significant public health benefit?
No. USEPA estimated very little public health benefit of the elimination of chrysotile asbestos use in chlor-alkali manufacturing. This is based on the fact that only a small number of workers may be exposed to asbestos fibers and that the potential exposures are minimized through the use of engineering controls, work practices, and the use of PPE. The proposal to ban the use of chrysotile asbestos in diaphragm cell technology is aimed at reducing the risk of exposure to asbestos for an estimated 100-200 workers nationally in the chlor-alkali industry. The health and safety of these workers is vitally important and they are protected by strict regulations enforced by the Occupational Safety and Health Administration (OSHA), which includes the use of PPE, medical monitoring, highly controlled work areas and other engineering controls. This group of trained workers has safely handled asbestos in chlorine plants for decades.

What about the public health benefits for communities located near manufacturing plants? Would elimination of chrysotile asbestos benefit those communities?
No. Although USEPA's TSCA risk evaluation did not look at the potential for exposure in surrounding communities, releases of asbestos to the ambient air and water are strictly controlled under the federal Clean Air Act and Clean Water Act. These federal programs have not identified risks from asbestos exposure in fence line communities.

USEPA has proposed a phaseout of chrysotile asbestos within two years, can the manufacturers switch to a different technology like membrane cells that don't use asbestos in such a short period of time?
No. There is no excess supply of chlorine in the United States. To replace one-third of the chlorine production in the United Stands, conversion to non-asbestos technology would require extensive modification of complex manufacturing facilities. Each plant is configured differently and presents unique engineering challenges, and, in fact, significant portions of the facility must be rebuilt or replaced to accommodate the new technology. The timeline required to plan, engineer, procure materials, obtain permits, construct, and safely commission a membrane plant is 4-5 years. For example, the average time it takes to prepare and obtain an air permit to commence construction is about 18 months.

Does USEPA expect banning the operation of one-third of the nation's chlorine capacity within a two-year period will cause price increases and supply chain shortages and disruptions?
Yes. USEPA acknowledges inflationary cost increases on chlorine-related products and its co-product sodium hydroxide are likely as a result of its proposed rule, but it vastly underestimates the negative impact of its proposal. USEPA's current proposal to ban asbestos diaphragm cell production within two years of the rule's effective date would critically disrupt the supply of chlorine for water treatment, and other important applications, causing serious supply chain impacts, including increased costs and shortages in other sectors like agriculture, automotive, building and construction, climate solutions and a wide range of other consumer products

Why would a shortage of chlorine cause such widespread impacts?
In addition to supplying 98% of public drinking water facilities, chlorine chemistry is essential to the manufacture of 88% of the top-selling pharmaceuticals (both over-the-counter medicine and prescription medicine) and 89% of the top-selling crop protection products that are used by U.S. farmers to make food more available and affordable. There is currently no surplus of chlorine on the market. Removing one-third of the chlorine produced in the U.S. will have an immediate domino effect on domestic markets.

Other critical chlorine-dependent industries and products include:

- **Healthcare:** blood bags and tubing, oxygen masks, surgical sutures, artificial joints, eyeglasses, disinfectants
- **Building & Construction:** municipal water system infrastructure, vinyl siding, electrical insulation, pipes, windows, decks, paints
- **Transportation:** shatter-resistant windows, jet engine shafts, air bags, brake fluid, deicing fluid for aircraft
- **Climate and Sustainability:** solar panels, hybrid and electric car batteries, insulation, wind turbine blades, climate-friendly refrigerants
- **Technology:** computer chips, smartphones, fiber optic cables, satellites
- **Defense & Law Enforcement:** bullet-resistant gear, riot shields, parachutes, night-vision goggles

Sodium hydroxide is a co-product of the chlorine manufacturing process, and USEPA's proposed rule would similarly negatively impact the supply of this important chemical. It is used in the manufacture of hundreds of consumer products, including aluminum, paper products, adhesives, detergents, pharmaceuticals, food additives, soaps, shampoos, auto parts, phones, fuel cells and disinfectants.

How do we know that there would be supply chain shortages and disruption?
In 2021, the U.S. chlor-alkali industry lost about 15% of its capacity (half of what would be impacted by USEPA's proposal) due to the impacts of Winter Storm Uri, Hurricane Ida, and other unplanned events. This resulted in severe supply shortages, leading several drinking water systems to seek the USEPA's assistance to source the chlorine necessary for water treatment.

In a June 30, 2021, letter[1] to chemical manufacturers and suppliers, USEPA Administrator Michael Regan highlighted the importance of reliable and sustainable sources of chlorine and the public health dangers a shortage would bring, writing:

> "If drinking water systems cannot obtain a sufficient and reliable supply of gaseous chlorine, sodium hypochlorite and calcium hypochlorite [derived from chlorine], they will be unable continue to provide safe drinking water to their communities;" and
>
> "Similarly, if wastewater systems lack adequate chlorine supplies, they will be unable to disinfect treated wastewater prior to discharge to surface waters, potentially leading to an increase in the concentration of pathogens in the surface water. A loss of drinking water or wastewater services, even for short durations, would have cascading impacts on hospitals, manufacturing, government facilities, private offices and restaurants - essentially all of the critical services necessary to sustain a community."

If a 15% temporary shortage of chlorine supply can trigger such a negative impact for critical water treatment and other products, USEPA's proposal, which would result in an abrupt elimination of one-third of the country's chlorine manufacturing capacity without a plan to replace this capacity, would certainly adversely affect public health. It would also cause significant inflationary impacts on chlorine-dependent products, severe supply chain disruptions and shortages of many life-saving and life-enhancing products.

Is there a solution?
Yes. USEPA can allow continued use of asbestos diaphragm cells at chlorine manufacturing facilities, where regulations protect the people who work in these facilities and the residents of the surrounding communities. The manufacturers are committed to the safety of their workers and to an orderly transition to non-asbestos technology that avoids shortages, cost increases and supply chain disruptions of the many critical products dependent on chlorine and sodium hydroxide. But USEPA's proposed timetables are just not reasonable. In Canada and the European Union (EU), the governments worked with producers to establish timetables that allow for the continued safe production of chlorine and its co-products during this transition. Canada's ongoing phase-out period is 11 years for a single plant and the EU has provided its industry 25 years.

[1] Letter from EPA Administrator Michael S. Regan to Chemical Industry Partners, June 30, 2021.