Draft Revision to Toxic Substances Control Act (TSCA) Risk Determination for n-Methylpyrrolidone (NMP) (Docket ID EPA-HQ-OPPT-2016-0743)

Comment of the American Fuels & Petrochemical Manufacturers and the American Petroleum Institute

August 1, 2022

The American Fuel & Petrochemical Manufacturers (AFPM) and the American Petroleum Institute (API) respectfully submit these comments on the Environmental Protection Agency's (EPA or the Agency) draft revision to the Toxic Substances Control Act (TSCA) risk determination for n-methylpyrrolidone (NMP).[1] AFPM and API represent the whole range of the petroleum supply chain from upstream exploration and production to midstream processing and distribution to downstream refining. AFPM and API member facilities are among the most regulated in the U.S., by authorities such as EPA, the Occupational Safety and Health Administration (OSHA), the Department of Homeland Security (DHS), the United States Coast Guard (USCG), and state agencies.

In summary:

- Policy changes underlying the draft revision of the risk determination for NMP are contrary to science and the statute.

- EPA's NMP risk evaluation does not properly characterize NMP use and potential exposure in lubricant extraction. It does not accurately reflect the risk to workers in the petroleum and petrochemical industry. When units are opened, such as for maintenance and turnarounds, which is infrequent, specialized precautions and procedures are in place to prevent or control releases and exposures.

- Additional requirements for NMP use in lubricant extraction would be unwarranted.

1. Policy changes are contrary to science and the statute

Like other draft risk determination revisions EPA recently has released, the draft revision of the NMP risk evaluation reflects policy changes including (1) making a "whole chemical" determination that the substance presents an unreasonable risk,[2] and (2) assuming workers do not wear personal protective equipment (PPE) or take other appropriate worker protection measures. As explained in our concurrent comments on the draft revision to the TSCA unreasonable risk determination for perchloroethylene (PCE or PERC),[3] these approaches are contrary to

[1] 87 Fed. Reg. 39511 (July 1, 2022).

[2] Historically, EPA made separate unreasonable risk determinations for every condition of use of a chemical. EPA recently decided to modify this approach when conducting risk assessments under TCSA. Per the EPA "[f]or the first 10 chemicals under TSCA and for any similar chemical that presents significant risks across many uses, EPA will continue to assess and analyze each condition of use, but then the agency plans to make the determination of unreasonable risk just once for the whole chemical when it is clear the majority of the conditions of use warrant one determination." EPA is referring to this as the "whole chemical approach." *See* also, https://www.epa.gov/newsreleases/epa-announces-path-forward-tsca-chemical-risk-evaluations.

[3] Comments of AFPM an API on "Perchloroethylene (PCE); Draft Revision to Toxic Substances Control Act (TSCA) Risk Determination; Notice of Availability and Request for Comment" - 87 *Federal Register* 39085 - 39091, June 30, 2022. Docket# EPA-HQ-OPPT-2016-0732.

established risk assessment science and to the statute. We incorporate by reference our concurrent comments on the PCE risk evaluation revision.

EPA's revised risk determination would be "explicit that it does not rely on assumptions regarding the use of personal protective equipment (PPE) in making the unreasonable risk determination under TSCA section 6."[4] NMP use in lubricant extraction is an example of a specific condition of use for which the assumption that no worker protection measures are in place is patently false, as discussed below. We urge EPA not to do its risk evaluations in this manner, which is highly misleading and contrary to established science, the statute, and EPA's codified risk evaluation procedures—all of which contemplate a valid exposure assessment rather than an incorrect blanket assumption.

These comments focus on the use of NMP in lubricant extraction in the petroleum industry, which is covered in the risk evaluation condition of use as a processing aid in petroleum production and petrochemical manufacturing.[5] EPA's risk evaluation concludes that this condition of use presents an unreasonable risk to workers based on developmental and reproductive effects from inhalation and dermal exposures. This conclusion is based on flawed analysis that overestimates worker exposure. Below we provide further information to explain that the risk evaluation does not properly characterize NMP use and potential exposure (and thus risk) in lubricant extraction and why additional requirements for NMP use in lubricant extraction would be unwarranted.

2. The risk evaluation does not properly characterize NMP use and potential exposure in lubricant extraction

EPA must refine its information and correct deficiencies in its risk evaluation before moving into the risk management phase for NMP. EPA needs to accurately characterize the exposure to workers in the petroleum and petrochemical industry, which it has not done yet in the risk evaluation.

Lubricant extraction is a refining step that uses a solvent to physically separate undesirable aromatic and polar components from the lubricant base stocks. Lubricant extraction occurs in a treater tower by the preferential solubility of the aromatic and polar molecules in a heavy, solvent-rich phase (extraction solution) which goes to the bottom of the tower. The lighter, oil-rich phase (raffinate solution) containing the remaining paraffinic and naphthenic molecules with some dissolved solvent, goes to the top of the tower. These streams are further processed to clean and purify the raffinate, remove solvent from the extract, and reclaim and recirculate the solvent back into the process.[6]

[4] 87 FR 39513.

[5] Condition of use 5.2.1.20 Industrial and Commercial Use – Processing aids, specific to petroleum production – Petrochemical Manufacturing; – Other uses – Other uses in Oil and Gas Drilling, Extraction and Support Activities; Functional fluids (closed systems) (petrochemical manufacturing and other uses in oil and gas drilling and as functional fluids (closed systems)).

[6] There also may be a deasphalting step to process vacuum residue.

Following solvent extraction, hydrofining is typically necessary to remove sulfur compounds and other impurities from the raffinate. If wax is present, then a dewaxing process is necessary, which is commonly the final processing step in producing the lube base stocks and the byproduct waxes. Lube base stocks are usually transported to blending plants where they are blended with additives as well as with each other to make finished lubricants that have well-defined performance characteristics and end uses (i.e., engine oils, compressor oils, gear oils, etc.).

Lubricant extraction removes the polycyclic aromatic hydrocarbons, most of which have carcinogenic ratings, and it improves the finished lube base stocks oxidative and thermal stability, which results in less oil breakdown and deposit formation during end-use conditions. The oil Viscosity Index is also increased, which reduces changes in viscosity between hot and cold environments.

2.1. EPA's NMP risk evaluation does not accurately reflect risk to workers in the petroleum and petrochemical industry

EPA's December 2020 risk evaluation for NMP determined that there is unreasonable risk to workers even before EPA eliminated the assumption of any PPE use. However, the assumptions EPA used did not accurately reflect worker protection measures in place. For instance, under the scenarios that led to the unreasonable risk determination, EPA did not assume chemically resistant gloves or respirators are used and assumed that there is no training in place for tasks where dermal exposure can be expected to occur. EPA's approach to assessing occupational exposure was based on a generalized scenario, not the real condition of use of NMP in lubricant extraction.

Lubricant extraction units using NMP are closed processes under normal operating conditions. When units are opened, such as for maintenance and turnarounds, specialized precautions and procedures are in place to prevent or control releases and exposures. Activities outside the closed processes, such as offloading NMP from tank trucks to a holding tank, occur infrequently and are completed quickly.

Lubricant producers have long-standing worker and environmental safety programs in place to eliminate or minimize exposures to hazards, including chemicals. Industrial hygiene programs and regular occupational exposure evaluations are key elements of worker health and safety protection. Industrial hygiene groups carry out periodic qualitative and quantitative assessments of operations, (i.e., manufacturing processes, maintenance, and laboratory activities) and evaluate results against established occupational exposure limits.

Safety programs include qualitative assessments of worker groups and activities to help identify jobs and tasks that warrant quantitative assessments of exposures. Safety and health programs in compliance with the OSHA Respiratory Protection Standard (CFR 1910.134) may be implemented based on airborne monitoring results of work assignments and tasks. Tasks that undergo assessments include draining equipment for opening, maintenance on opened equipment, unloading bulk chemical shipments, collecting chemical samples, and laboratory work.

Dermal exposures are negligible when NMP is contained in closed process equipment and workers are required to wear gloves to handle any piece of equipment. Chemical impervious gloves and other PPE are selected and worn for tasks where skin contact may occur, such as sample collection, opening equipment, and laboratory work. Safety programs focused on minimizing exposure risks to workplace hazards (which includes training, safe operating procedures, proper selection and use of PPE, and spill response plans) are proven to be effective in maintaining low exposures and protecting worker health over years of operation.

EPA's NMP risk evaluation does not accurately reflect risk to workers in the petroleum and petrochemical industry because it does not take proper account of the safety protocols in place at refineries. These extensive protocols address not only NMP but many other chemicals, some of which have a higher hazard profile than NMP. The safety practices in place for any activity are based on the highest potential hazard chemical involved and thus are very conservative in terms of protection for the other chemicals used in the activity. If there are other processing uses that occur outside of refineries and are subject to different conditions, EPA should consider them separately and not apply generalized least-common-denominator assumptions.

3. Additional requirements for NMP use in lubricant extraction would be unwarranted

EPA states that it will initiate risk management for NMP by applying one or more of the requirements under TSCA section 6(a) to the extent necessary so that NMP no longer presents an unreasonable risk.[7] There is no need for additional requirements that would apply to NMP used in lubricant extraction. The industry has developed safe operating protocols for lubricant extraction operations, including the use of NMP. These specific operating protocols exist within the broader framework of the robust hazard communication and safety programs at refineries. EPA needs to reflect all aspects of these real-world conditions of use in any further evaluation of risk or consideration of the need for risk management requirements.

At the risk management phase, EPA is also required under TSCA section 6(c) to consider factors including, but not limited to, the benefits of the chemical substance or mixture for various uses and whether technically and economically feasible alternatives that benefit health or the environment will be reasonably available as a substitute in the case of a proposed prohibition or other restriction. NMP was introduced in the mid-1970s as an extraction solvent that was proven to have high selectivity (capacity to extract aromatics), low flammability, low volatility, thermal stability, and other physio-chemical attributes that make it highly suitable and safe for use. In many cases, NMP replaced the more toxic phenols in older extraction units throughout the industry. Solvents previously commercialized for lube extraction include sulfur dioxide, a combination of propane with a phenol/cresol mixture (known as Duo-sol), phenol, and furfural.

EPA should consult closely with industry and other qualified experts to understand the controls that have been developed and are in place for this condition of use. AFPM, API, and our members are available to answer questions and provide additional information.

[7] EPA, N-Methylpyrrolidone (NMP) DRAFT FOR PUBLIC COMMENT, EPA-HQ-OPPT-2016-0743-0118.

AFPM and API appreciate the opportunity to submit these comments and are committed to working constructively with EPA throughout TSCA implementation. For questions or clarifications, please contact James Cooper at jcooper@afpm.org or Michael Kennedy at kennedym@api.org.

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