North Omaha Station Human Health and Environmental Risk Assessment Summary

EPRI conducted a comprehensive risk assessment of emissions from coal-fired Units 4 and 5 at Omaha Public Power District's North Omaha Station (NOS) should OPPD delay the currently planned fuel switch of these two units from coal to natural gas. Evaluating potential impacts to human health and the environment using models and methodologies developed by the U.S. Environmental Protection Agency (EPA), the results demonstrate that the human health and environmental risks from the continued operations of NOS Units 4 and 5 are all below EPA thresholds for adverse effects and that the facility does not pose a significant risk to the public or environment.

AIR QUALITY

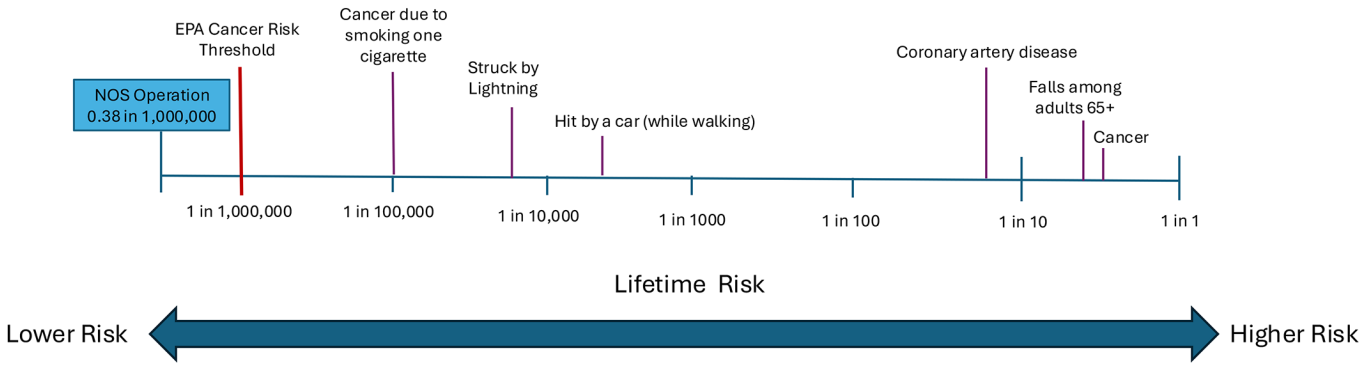
The EPA sets National Ambient Air Quality Standards (NAAQS) for protection of public health and the environment, including protecting the health of sensitive populations such as asthmatics, children, and the elderly. These NAAQS are area-based and NOS in its current configuration operates in an area in compliance with these standards, including recent revisions to the standards for additional health protection. According to the Nebraska Department of Water, Energy, and Environment, and EPA, the entire state is in attainment for all criteria air pollutants (particulate matter [PM], ozone, nitrogen dioxide [NO_2], sulfur dioxide [SO_2], carbon monoxide [CO], and lead). This means that the air quality in this area meets or is cleaner than these standards.

For "hazardous air pollutants" (HAPs), more commonly referred to as air toxics, the EPA has developed risk thresholds to protect public health with an ample margin of safety and protect against adverse environmental effects. The results of this study show that air toxic risks from the NOS facility in its current configuration are below these thresholds.

RISK ASSESSMENT

For inhalation cancer risk, the EPA typically uses a benchmark of ***1 in 1 million*** as a threshold. This means that if a person were exposed to a pollutant continuously over a 70-year lifetime, the risk of developing cancer due to that exposure should not exceed one additional case of cancer per million people (note that the risk of developing cancer from all causes is about 1 in 3 people). The maximum modeled cancer risk for the continued operation of Units 4 and 5 at North Omaha Station was found to be 0.38 in a million or 1 in 2,600,000 – less than half of the 1 in a million threshold.

For non-cancer inhalation risks, the EPA uses ***hazard quotients*** (HQ) and ***hazard indices*** (HI). These values assess risks from short-term (acute) and long-term (chronic) exposures to substances. They are calculated separately for each organ system. by comparing estimated exposure levels to reference doses or concentrations that are considered safe. If the maximum HQ or HI is *below 1.0*, that indicates that exposure is unlikely to cause adverse health effects. For the continued operation of Units 4 and 5 at North Omaha Station, the HQ was 0.002 and the HI was 0.07 – both below 1.0, the EPA risk threshold.



EPA also establishes "multi-pathway" risk screening cancer and non-cancer thresholds for chemicals that tend to bioaccumulate in the environment. These risks are evaluated for direct exposure from inhalation and indirect exposure through ingestion. These non-inhalation pathways include incidental ingestion of soil, and ingestion of locally grown fruits and vegetables; beef, dairy, poultry, eggs, and pork from locally raised livestock; and fish caught in local waterbodies. These are evaluated against "screening values" and the detailed risk assessment shows calculated risks from NOS emissions to be below these thresholds.

Lastly, the facility's emissions were evaluated against thresholds that protect the local environment against adverse risks to plant species, aquatic life, and wildfire. The risk assessment shows that these risks were also below the EPA-defined risk thresholds.

Overall, EPA's air pollutant thresholds are conservative, designed to ensure a high margin of safety. To put these thresholds in context, consider other common risks. For cancer, smoking one cigarette is estimated to increase cancer risk by 1 in 100,000 — 10 times higher than EPA's threshold. For non-cancer health impacts, eating fish with mercury once a week, a person's HQ might be 0.2-0.5 — below 1.0 and so generally considered safe. Accordingly, the modeled risks of continued operations of Units 4 and 5 are smaller than these common risks and below the thresholds set by EPA.

KEY FINDINGS

- **NOS Units 4 and 5 do not pose a significant risk to the public or environment** as defined by the U.S. Environmental Protection Agency (EPA).
- **Human health risks are below standard thresholds.** The human health risks from the continued operations of NOS Units 4 and 5 are all below EPA thresholds.
- **Regional air quality meets applicable standards.** The Omaha metropolitan area remains in attainment for all EPA criteria pollutants, including the newly revised $PM_{2.5}$ standard.

CONCLUSION

The assessment indicates that continued coal combustion at NOS Units 4 and 5 does not cause EPA-defined significant risks to human health or the environment. These findings can support informed decision-making by OPPD, its regulators, and the public.

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