SAFETY EVALUATION:
ALPHA RIDGE LANDFILL EMISSIONS
FROM FLARE AND PROPOSED ENGINE

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I have been asked, as a toxicologist, to evaluate whether the proposal to burn gas from the Alpha Ridge Landfill in an internal combustion engine would be safe.

In order to answer this, my colleague Steve Zemba, Ph.D., P.E., and I have examined the amounts and types of chemicals that could be emitted from the proposed landfill gas-powered engine, as well as from the existing landfill gas flare.

And we have estimated the largest impacts of each emitted chemical that could be present in air at the closest house (and/or at the closest possible house in future development).

We then compared each of these predicted impacts to concentrations that are known and/or expected to be harmless.

In each case, as shown in the following table, the predicted impacts were found to be harmless, by ample margins of safety.

We also evaluated impacts from potential emissions of polychlorinated dibenzo-*p*-dioxins and polychlorinated dibenzo-furans ("dioxins"), and found them to be well within safe limits.[1]

Accordingly, combustion of gas from the Alpha Ridge Landfill in the proposed engine would not be expected to harm people's health.

[1] For details, please see our handout, "Information on Polychlorinated Dibenzo-*p*-Dioxins and Polychlorinated Dibenzo-Furans — Also Known As 'Dioxins'."

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Potential emissions	Impacts at the nearest house (micrograms *per* cubic meter of ambient air: µg/m^3)	Harmless concentrations * (µg/m^3)	Is potential impact harmless?
Benzene	0.0003	≤ 3	Yes
Chlorobenzene	0.0003	≤ 50	Yes
Chloromethane	0.0002	≤ 13	Yes
Cyclohexane	0.0004	≤ 6,000	Yes
Cumene	0.0009	≤ 400	Yes
Decane	0.007	≤ 3,500	Yes
1,4-Dichlorobenzene	0.0003	≤ 2	Yes
cis-1,2-Dichloroethylene	0.0001	≤ 7	Yes
Ethylbenzene	0.003	≤ 9	Yes
Ethyl Chloride	0.0003	≤ 10,000	Yes
n-Hexane	0.001	≤ 700	Yes
Hydrogen Sulfide	0.005	≤ 2	Yes
Isopropanol	0.0002	≤ 7,000	Yes
Methylcyclohexane	0.0009	≤ 3,000	Yes
Methylcyclopentane	0.0004	≤ 1,400	Yes
n-Nonane	0.006	≤ 200	Yes
n-Pentane	0.0002	≤ 1,000	Yes
n-Propylbenzene	0.0006	≤ 1,000	Yes
Styrene	0.0008	≤ 1,000	Yes
Toluene	0.001	≤ 5,000	Yes
1,2,4-Trimethylbenzene	0.002	≤ 7	Yes
1,3,5-Trimethylbenzene	0.001	≤ 6	Yes
Vinyl Chloride	0.0006	≤ 5	Yes
Xylenes	0.007	≤ 100	Yes

* Harmless concentrations are derived, by health scientists at U.S. EPA and elsewhere, from dose-response data from epidemiologic studies and/or studies in laboratory animals, and incorporate ample margins of safety, such that they pose no significant risk to health.

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