Key scientific issues CASAC should weigh in on:

- Primary standard
 - Is the current primary standard adequate to protect public health, with an adequate margin of safety, against adverse effects from ozone pollution?
 - Is EPA staff's consideration of the ATS statement regarding what constitutes an adverse respiratory effect consistent with the statement?¹
 - \circ Whether EPA staff's near sole reliance on controlled human exposure studies is scientifically justified, given that those studies do not look at children or children with asthma.²
 - What is the lowest level of ozone exposure, over 6-8 hours, that causes an adverse effect in healthy young adults?³ This question is distinct from what the level of the standard should be.
 - Whether lower levels of ozone exposure, over 6-8 hours, is likely to cause adverse effects in other people, not studied in the relevant controlled human exposure studies. This question is distinct from what the level of the standard should be.
 - What is the lowest level of ozone exposure over 6-8 hours that is likely to cause adverse effects in people not studied in the relevant

¹ See Draft PA 3-31:14 to -32:13, 3-94:4-:33, 3-100:17-:21.

² See Draft PA 1-14:21-:22 (noting "the primary role of controlled human exposure studies in the most recent decisions on the primary standard"), 3-2:12-:17 (similar); 3-40:1-:2 (similar), 3-47:26-:29 (noting how controlled human exposure studies don't cover children or people with asthma well), 3-48:5-:25 (similar), 3-59:13-:21 & n.81 (detailing how Exposure Assessment has been adjusted to correspond in key ways closer to controlled human exposure study conditions), 3-61:8-:11, :27-:30 (explaining how Risk Assessment is based on controlled human exposure studies), 3-72:23-:25 (noting how controlled human exposure studies at 60-80 ppb don't cover children or people with asthma), 3-84:33-:34 (controlled human exposure circumstances associated with O₃ health effects"), 3-93:17-:20. But see, e.g., id. 3-44:15 to -45:11 (discussing limited purposes for which EPA staff considered epidemiological studies).

³ See Draft PA 3-95:26-:30, 3-100:12-:17.

controlled human exposure studies? This question is distinct from what the level of the standard should be.

- \circ Is there a particular FEV₁ decrement that itself is an adverse effect or is a good proxy for an individual's experiencing an adverse effect?⁴
- Does EPA staff's use of the exposure assessment allow for rational consideration of the harms to vulnerable populations—like outdoor workers or children at summer camps—from ozone pollution?⁵
- Does EPA staff's APEX modeling accurately estimate exposures of concern for groups other than outdoor workers and children at summer camps?
- Does the current standard protect against adverse effects from longterm ozone exposure?
- What are the synergistic effects of ozone on populations exposed to other harmful air pollutants, and how should EPA consider those cumulative effects in reviewing the primary ozone standard?
- Is EPA's truncation convention for data handling and design value calculations scientifically justified?⁶
- Secondary
 - Is the current secondary standard adequate to protect vegetation, ecosystems, and climate against known or anticipated adverse effects of ozone pollution?
 - What scientific evidence exists to help EPA determine what form and level of secondary ozone standard is requisite to protect the climate against known or anticipated adverse effects from ozone?
 - Is the W126 form a more scientifically justified form for analyzing ozone's impact on vegetation than the primary standard's form?⁷
 - EPA staff examines overall trends in the primary standard design values and W126 index to suggest that the current standard generally

⁴ See Draft PA 3-96 n.104.

⁵ See Draft PA 3-54 to -55 n.69.

⁶ Draft PA 2-14:14-:17, 2-15:1-:4 (reporting from monitors), 2:15 n.19 (calculations).

⁷ See Draft PA 4-10:6-:12.

controls W126 values.⁸ Is this scientifically justified? Is EPA staff failing to consider specific areas where the relationship it relies on may not hold?

- EPA staff also suggests that the W126 index is not effective at limiting peak concentrations of ozone, particularly measured as N100 or D100.⁹ Bearing in mind that the W126 index more heavily weights high ozone levels and has never had any regulatory force at all, is EPA staff's suggestion rational? Further, because the current primary standard will continue to operate to control such short-term peaks and, in any event, nothing legally prevents EPA from adopting two secondary standards of different forms, similar to what it has done with the primary PM standards, is EPA staff's suggestion rational?
- CASAC has long urged a single-year averaging period to protect against one-year ozone peaks. The Draft PA, drawing on the 2020 decision, now focuses on N100 (or, at times, D100) as the metric for examining single-year peaks.¹⁰ Is that scientifically justified or is W126 the proper scientific measure for identifying single-year peaks?¹¹ If W126, what's the threshold for what constitutes a peak that must be prevented?
- EPA staff suggests 3-year average RBL and RYL and similarly 3-year average W126 is somehow more reliable than single-year.¹² Is this suggestion scientifically justified?

⁹ See Draft PA 4-67 to -71, 4-89:9-:11, 4-116:23-28.

¹⁰ See Draft PA 4-7:21 to -8:5 & n.8, 4-9:16 to -10:3 & n.12, 4-43:7-:22 (addressing leaf damage), 4-58:13-:17, 4-49:3-:15, 4-66:1-:4, 4-84:18 to -85:16, 4-88:11 to -89:22, 4-93:24 to -94:2, 4-98:31 to -99:7 (addressing leaf damage), 4-116:1-:20 (considering peak hourly concentrations in addition to W126 even though evidence does not indicate any "reference point for elevated concentrations"), 4-118:7-:11. *But see id.* 4-44 n.57 (high peaks not so relevant for growth).

¹¹ See Draft PA 4-8 n.9.

⁸ See Draft PA 4-62:14-:29, 4-63 fig.4-9, 4-64:1-:31, 4-65 fig.4-10, 4-116:16-:23.

¹² See Draft PA 4-8:6 to -9:12 & n.10, 4-90:1 to -93:24, 4:117:3 to -118:11.

- Does it accord with your advice for EPA to write off elevated singleyear levels of W126?¹³
- What averaging period (single year, 3 year, or something else) is requisite to protect against adverse effects that vegetation, crops, and ecosystems are subject to from 24-hour, year-round exposure to ozone?
- If any period could suffice, what specific changes, if any, to the level must EPA make to justify a 3-year period?
- Is EPA staff's apparent decision not to consider at all the eastern cottonwood data scientifically justified?¹⁴
- Is EPA staff's selected magnitude of RBL in tree seedlings (median of 6%) protective against adverse ozone damage to trees and ecosystems?
- What level is requisite to protect against known or anticipated adverse effects of continuous ozone exposure on vegetation growth, based on the scientific evidence available? Over what period?
- What level is requisite to protect against known or anticipated adverse visible leaf damage from continuous ozone exposure, based on the scientific evidence available? Over what period?¹⁵
- Is EPA staff overstating uncertainties and imprecisions?

¹³ See Draft PA 4-118:31 to -119:2

¹⁴ See Draft PA 4-37 n.43.

¹⁵ See Draft PA 4-12:7-:11, 4-112:16-:35.