SLO COUNTY apcd | Air Pollution Control District
San Luis Obispo County

September 5, 2025

Sarah Miggins
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SUBJECT: Comments on the California Department of Parks and Recreation's August 15, 2025, Oceano Dunes SVRA Draft 2025 Annual Report and Work Plan in Response to Stipulated Order of Abatement Number 17-01

Dear Ms. Miggins:

We are in receipt of your Draft 2025 Annual Report and Work Plan (ARWP) for the Oceano Dunes State Vehicular Recreation Area (ODSVRA), dated August 15, 2025. At your request, we extended the due date from August 1, as specified in the Stipulated Order of Abatement (SOA), to August 15, 2025; thank you for submitting the Draft ARWP by the modified deadline. On August 29, 2025, we received a memo from the Scientific Advisory Group (SAG) with comments on the 2025 ARWP.

The Draft ARWP documents the substantial ongoing effort by State Parks to control windblown dust emissions from the ODSVRA over the last several years, and it reports on the ambitious research and monitoring activities proposed in the last ARWP.

For the 2025-2026 cycle, there are no remaining temporary dust control projects to convert to permanent vegetation, but 37.1 acres of supplemental plantings are proposed in previously restored areas. The Draft ARWP does not propose any new dust controls; instead, it proposes reopening approximately 100 acres of the Plover Exclosure to seasonal vehicular access and camping. Additional PI-SWERL emissivity measurements and other monitoring activities are planned, as well as updates to the emissivity profiles to be used in future modeling.

As documented in the Draft ARWP (and also the air quality metrics recently presented to the Hearing Board) both modeling and measurements demonstrate significant, real improvements in emissions from the ODSVRA and in PM_{10} levels downwind. The Draft ARWP reports that current emissions from the park are estimated to be lower than emissions in the pre-disturbance scenario, and concludes that, "In this respect, there is compliance with the SOA." As discussed in depth in our attached comments, the District continues to have reservations about some of the assumptions that underlie this conclusion, so we cannot, at this time, find that Parks has achieved compliance with the SOA.

Furthermore, while we commend the thoughtful design of the proposed 100-acre reopening of the Plover Exclosure, we urge State Parks to reconsider this plan. There has been substantial progress toward achieving compliance with the goal of the ARWP—so much so, that current emissions are estimated to be very close to pre-disturbance emissions. Depending on the assumptions employed, emissions are now likely somewhere between about 13 tons/day less than pre-disturbance emissions, or perhaps a few tons/day over pre-disturbance emissions, as discussed below. The proposed seasonal reopening will increase emissions, threatening to undo progress made to date. As detailed in our comments, the District is not convinced that the ODSVRA will be in compliance with the SOA with the proposed reopening.

The SAG memo contains insightful comments and requests for revisions. The next draft of the ARWP should also address their comments.

According to the timelines required by the SOA, State Parks has 21 days or until September 26, 2025, to submit a revised ARWP for SAG and District review. After receipt of a provisionallyapprovable ARWP as required by the SOA, the APCD will schedule a public workshop. As we did last fall, the District plans to schedule the public workshop concurrently with a planned October 15, 2025, Hearing Board public meeting. This meeting will be held in-person at 9:00 a.m. in the San Luis Obispo County Board of Supervisors Chambers located at 1055 Monterey Street, San Luis Obispo, CA 93401. Thank you and feel free to contact me with any questions.

Respectfully,

KARL A. TUPPER
Air Pollution Control Officer

Enclosures

cc: Liz McGuirk & Jon O'Brien, CA DPR, APCD Hearing Board, APCD District Board, APCD District Counsel, Coastal Commission Staff & SAG

General Comments

As with the previous Annual Reports and Work Plans,[1] the DRAFT 2025 ARWP[2] documents a substantial effort by State Parks to understand and control windblown dust emissions from the ODSVRA over the past year. Between August 1, 2024, and August 15, 2025, State Parks completed the work proposed in the previous year's ARWP.

While no additional portions of the open-riding and camping area were converted to dust mitigations, State Parks managed 740.1 acres of the park for dust control. The final 12.3 acres of temporary controls were converted to permanent dune vegetation and another 28.9 acres of supplemental planting were completed in existing restoration areas.

The ARWP reports on the ambitious research and monitoring activities at the ODSVRA, including model refinements and other work intended to implement last year's ARWP and comply with the SOA. Much of this work was performed by or in close consultation with the SAG, and the District appreciates the tremendous effort expended by State Parks and the SAG on these activities. For the next year, the ARWP proposes continuing these activities, with some narrowed in scope. The District supports the continued data collection, as well as efforts to streamline.

For the 2025-2026 cycle, there are no remaining temporary dust control projects to convert to permanent vegetation, but 37.1 acres of supplemental plantings are proposed in previously restored areas. The ARWP does not propose converting any additional acreage of the open-riding and camping area to dust controls; instead, it proposes reopening approximately 100 acres of the Plover Exclosure to seasonal vehicular access and camping.

The 100 acres proposed for seasonal management are carefully configured to maximize coastal access while preserving landward nebkha and incipient dunes that have developed since the year-round closure began in 2021. Furthermore, the 3 lateral access corridors are positioned upwind of vegetation islands, rather than upwind of open sand fetches. These design features are expected to lessen wind shear downwind and thus lessen the air quality impact of the proposed reopening. The District appreciates this thoughtful approach. Nonetheless, for the reasons described below, the proposal to allow seasonal

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[1] Previous and current Annual Reports and Work Plans as well as comment letters, approval letters, and related documents can be found on the District's website at https://www.slocleanair.org/air-quality/oceano-dunesefforts.php.

[2] California Department of Parks and Recreation, Off-Highway Motor Vehicle Recreation Division, "Oceano Dunes State Vehicular Recreation Area Dust Control Program: Draft 2025 Annual Report and Work Plan," August 15, 2025. Available online at https://storage.googleapis.com/slocleanair-org/images/cms/upload/files/2025ARWP_APCD_Draft_20250815.pdf (main document) and https://storage.googleapis.com/slocleanair-org/images/cms/upload/files/2025_ARWP_Draft_Attachments_reduced.pdf (attachments).

access to part of this area is premature, and we strongly suggest that State Parks reconsider it.

Based on refined modeling, the 2025 ARWP reports that current emissions from the ODSVRA are lower today than in the pre-disturbance scenario, and it therefore concludes that State Parks has achieved the goal of the Stipulated Order of Abatement (SOA)—namely "to eliminate emissions in excess of naturally occurring emissions from the ODSVRA that contribute to downwind violations of the state and federal PM_{10} air quality standards."[3] Furthermore, it reports that the margin between current and pre-disturbance emissions is 12.7 tons/day—sufficiently large enough that the SOA goal will continue to be met, even with the increased emissions from the proposed seasonal reopening of a portion of the Plover Exclosure.

These conclusions rely on optimistic emissions calculations based on aggressive assumptions about emissions reductions, particularly for the Plover Exclosure area. A year ago, in our comment letter on the 2024 ARWP, we stated that "we continue to have reservations about the modeling of the Plover Exclosure area. Specifically, the modeling assumes this area to be less emissive today than it was prior to vehicular disturbance and less emissive than other non-riding areas within the contemporary ODSVRA."[4] These reservations remain, and, as discussed in more detail later, the results of the most recent PI-SWERL emissivity studies only add to them. We, therefore, do not concur with the ARWP's statement that "there is compliance with the SOA," and we cannot approve the 2025 ARWP in its current form.

Furthermore, with regard to the Plover Exclosure, last year's approved ARWP stated that "If State Parks elects to reopen this area in the future, State Parks would, in coordination with the SAG and the SLOAPCD, simultaneously identify and implement dust control projects in other areas that equal the credited mass emission reductions from the nesting exclosure."[5] The District's final approval letter of the ARWP incorporated this commitment as an enforceable condition: "If the Plover Exclosure area, in whole or in part, is reopened to public vehicular access, State Parks shall simultaneously implement District-approved dust

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[3] Hearing Board of the San Luis Obispo County Air Pollution Control District, "Order To Modify Existing Stipulated Order Of Abatement," Case 17-01, filed October 21, 2024. Available online at https://storage.googleapis.com/slocleanair-org/images/cms/upload/files/Modified%20Stipulated%20Order%20of%20Abatement%2017-01_FILED%2010-21-2024.pdf.

[4] Gary E. Willey to Sarah Miggins, "Comments on the California Department of Parks and Recreation's August 1, 2024, Oceano Dunes SVRA Draft 2024 Annual Report and Work Plan in Response to Stipulated Order of Abatement Number 17-01," dated August 21, 2024. Available on at https://storage.googleapis.com/slocleanair-org/images/cms/upload/files/2024-08-21%20APCD%20Comments%20on%20Draft%202024%20ARWP.pdf.

[5] California Department of Parks and Recreation, Off-Highway Motor Vehicle Recreation Division, "Oceano Dunes State Vehicular Recreation Area Dust Control Program: Provisional Final 2024 Annual Report and Work Plan," September 11, 2024. Available online at https://storage.googleapis.com/slocleanair-org/images/cms/upload/files/2024ARWP_ProvFinal_20240911_reduced.pdf.

controls sufficient to offset the resulting increase in emissions."[6] This condition remains in effect.

The reopening is proposed for October 1, 2025, and the ARWP estimates that this change will result in a net increase in emissions of 4.8 tons/day. The ARWP does not, however, propose any new dust controls to offset these emissions.[7] Moreover, it is unlikely that controls could be approved and installed by the planned October 1st reopening, as the SOA requires a public hearing prior to final approval of the ARWP, and that hearing is scheduled for October 15, 2025. Until the 2025 AWRP is approved, the conditions of the 2024 ARWP approval remain operative, and State Parks would be in violation of the SOA if it were to reopen any portion of the Plover Exclosure without APCO-approved dust mitigations in place to offset the increase in emissions.

These and other issues are discussed in greater detail below.

Supplemental Plantings and Observed Air Quality in 2024

The District strongly supports supplemental plantings within the footprint of previous vegetation projects. This activity has been a part of State Parks' work plans since at least 2021, and the 2025 ARWP plans for 37.1 acres of such planting, as shown in ARWP Figure 3-3. Supplemental planting is critical for ensuring that emission reductions from previous years are sustained and for ensuring that the emissions model reflects the on-the-ground reality.

The ARWP demonstrates that overall, the dust control projects are working as intended to reduce dust, but there is some indication of degraded effectiveness in the southern portion of the ODSVRA. Specifically, Section 2.3.1, "Increments Of Progress Toward Air Quality Objectives," demonstrates that the TPM10:TWPD ratio increased at Mesa2 for 2024. As shown in ARWP Figure 2-30, its value for 2024 is higher than for 2021, 2022, and 2023, and on the same order as its pre-SOA value.

Some of the increase in the TPM10:TWPD ratio at Mesa2 may be natural variation—the ratio for CDF also increased in 2024, but only to about the same level as it was in 2022; it remained lower than all earlier years. However, additional evidence also suggests decreased effectiveness upwind of Mesa2. As reported to the Hearing Board on June 25,

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[6] Gary E. Willey to Sarah Miggins, "Conditional Approval of California Department of Parks and Recreation's 2024 Annual Report and Work Plan in Response to Stipulated Order of Abatement Number 17-01," dated October 31, 2024. Available on at https://storage.googleapis.com/slocleanair-org/images/cms/upload/files/2024-10-31%20APCD%20Final%20Provisional%20Approval%20of%202024%20ARWP.pdf.

[7] The ARWP seems to assume that this 4.8 ton/day emissions increase does not need to be offset by new dust controls since parkwide emissions under this scenario are still calculated to be less than emissions in the pre-disturbance scenario. Assuming, for the sake of argument, that these emissions calculations are correct, the plain language of State Parks' prior commitment and the District conditions of approval, both quoted above, still require the implementation of offsetting-emission reduction projects prior to reopening.

2025,[8] the District's "Difference-in-Differences" analysis estimated that wind event day PM_{10} at Mesa2 improved by 10.4% in 2024 compared to 2017, but this is less improvement than estimated for 2023 and 2022 (22.2% and 13.8% improvement, respectively). In contrast, this analysis showed continued incremental improvement at CDF over the same period, with estimated reductions in PM_{10} (versus 2017) of 39.0% for 2024, 38.1% in 2023, and 31.6% in 2022.[9] Finally, the so-called "SAG metric", also discussed at the June 25th Hearing Board meeting, corroborates this trend. Applied to CDF, it shows continued improvement in 2024 compared to previous years (i.e., a trend toward lower values), while for Mesa2 the SAG metric increased slightly in 2024.[10]

For this reason, the District encourages State Parks to reconsider its plan for supplemental planting and focus as much as possible on the area upwind of Mesa2. Of the areas slated for planting in the current plan (ARWP Figure 3-3), 2022-VG-03, 2022-VG-07, and 2024-VG-01 appear to be in the zone of influence for Mesa2. The more northerly projects, especially 2019-VG-01, do not appear to be upwind of Mesa2, and should be swapped for restoration projects further south that are likely to improve conditions at Mesa2.

Expanding the total acreage of supplemental planting should also be considered. In 2024, State Parks completed a total of 41.2 acres of planting (both supplemental and conversion of temporary dust controls), so it appears to be within State Parks' capacity to complete more than the planned 37.1 acres in 2025.

Emissivity of the Plover Exclosure

In the refined modeling discussed in the Draft 2025 ARWP, the emissivity of the Plover Exclosure is assumed to be lower today than under pre-disturbance conditions and lower than other non-riding areas within the contemporary ODSVRA. This is apparent in ARWP Figure 2-33, which shows this area in dark blue in the current landscape but lighter blue in the 1939 pre-disturbance scenario. As already noted, the District is skeptical of this assumption.

This skepticism is not new. For as long as State Parks has sought credit for emission reductions resulting from the continuous closure of the area, the District has expressed

[8] Materials related specifically to Hearing Board meetings can be found on the District's website at https://www.slocleanair.org/who/board/hearing-board.php.

[9] San Luis Obispo County Air Pollution Control District, "2024 Annual Air Quality Report," June 2025. Available online at https://storage.googleapis.com/slocleanair-org/images/cms/upload/files/2024%20Annual%20Air%20Quality%20Report.pdf.

[10] San Luis Obispo County Air Pollution Control District, "Report on Possible Compliance Metric for the Stipulated Order of Abatement in Case 17-01," June 25, 2025. Available online at https://storage.googleapis.com/slocleanair-org/images/cms/upload/files/HB%20Staff%20Report2.pdf.

reservations about the assumptions used to estimate these reductions. See our comments on the draft 2022 ARWP,[11] our 2022 Hearing Board application,[12] our 2023 comments on the SAG's "Recommendations for Establishing Emissivity Grids,"[13] our comments on the first draft 2023 ARWP,[14] our 2024 approval of the modeling assumptions for the 2024 ARWP,[15] and our comments on the draft 2024 ARWP.[4]

Fundamentally, the District objects to the notion that the emissivity of the Plover Exclosure is lower today—after being closed to vehicular activity for approximately 5 years—than it was prior to vehicular activity, as assumed in the pre-disturbance scenario. Other than the Foredune Restoration Area (FRA), all other areas of the park which are closed riding today are modeled assuming the same non-riding area emissivity profile in both the contemporary and pre-disturbance scenarios; there is no a priori reason to treat the Plover Exclosure differently. It also seems counterintuitive to assume that its emissivity is lower today, after being closed to vehicular activity for only 5 years, than other non-riding areas of the park that have been closed for decades.

The emissivity profiles in the 2025 ARWP modeling are derived from and informed by PI-SWERL emissivity measurements taken in the area since 2013, and in this sense, they are data-based. However, as noted repeatedly in the District correspondence cited above, there is substantial variability in PI-SWERL measurements across space and time. To quote from our 2023 comments:[13]

> *[T]he location and timing of PI-SWERL measurements were neither random nor consistent from one campaign to the next, and this greatly complicates comparisons between areas and across time. While there is not a statistically significant linear trend across time, there appears to be statistically significant differences between campaigns and between areas … For example … for both riding and non-riding areas, the*

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[11] San Luis Obispo County Air Pollution Control District, "Comments on the DRAFT 2022 Annual Report and Work Plan dated August 1, 2022," Augst 23, 2022. Available online at https://storage.googleapis.com/slocleanair-org/images/cms/upload/files/APCD%20Comments%20on%20SP%20Draft%202022%20ARWP_pdf.pdf.

[12] San Luis Obispo County Air Pollution Control District, "Air Pollution Control Officer's Application To Modify The Terms And Conditions Of Stipulated Order Of Abatement In Case 17-01," October 5, 2022. Available online at https://storage.googleapis.com/slocleanair-org/images/cms/upload/files/Application%20to%20modify.pdf.

[13] San Luis Obispo County Air Pollution Control District, "APCD Comments on SAG Proposal Re: Emissivity Grids," August 1, 2023. https://storage.googleapis.com/slocleanair-org/images/cms/upload/files/Revised%20Comments%20on%20SAG%20proposal%20on%20emissivity%20grids.pdf.

[14] Gary E. Willey to Sarah Miggins, "Comments on the California Department of Parks and Recreation's August 1, 2023, Oceano Dunes SVRA Draft 2023 Annual Report and Work Plan in Response to Stipulated Order of Abatement Number 17-01," August 21, 2023. Available online at https://storage.googleapis.com/slocleanair-org/images/cms/upload/files/2023%20Draft%20ARWP%20APCD%20Comments%20%26%20Cover%20Ltr.pdf.

[15] Gary E. Willey to Sarah Miggins, "Approval of California Department of Parks and Recreation's Modeling Assumptions to be used in their 2024 Annual Report and Work Plan in Response to Stipulated Order of Abatement Number 17-01," February 8, 2024. Available online at https://storage.googleapis.com/slocleanair-org/images/cms/upload/files/Modeling%20Conditional%20Approval.pdf

> *measurements from August 2013 are statistically significantly higher than those from May 2022.*
>
> *The emissivity grid is supposed to capture the spatial variation in emissivity, so disentangling spatial effects from temporal effects is critical. For some zones, this may not be possible with the data discussed in the [June 2023 SAG Memo on Emissivity Assumptions]. For example, as shown in Memo Figure 8, measurements made in the Plover Exclosure (PE) and Foredune Restoration Area (FRA) skew lower than measurements made in the other non-riding areas (NRA), but the PE and FRA were measured only in September 2022, while none of the NRA measurements were made then.* ***Thus, it is impossible to determine whether the lower emissivity of the PE and FRA relative to the NRAs is a spatial or temporal effect.*** *[Emphasis added.]*

Since those comments, for the first (and thus far only) time, PI-SWERL emissivity measurements were conducted in the Plover Exclosure at the same time as elsewhere in the ODSVRA. This occurred over 8 days in September 2024. These data are shown below in Figure 1 using box-and-whisker plots analogous to those in ARWP Attachment 05. Depicted as such, the emissivity of the Plover Exclosure appears to be indistinguishable from that Non-Riding Area (NRA) South zone and the Seasonal Beach zone, and a Krustal-Wallis test[16] indicates that there are no significant differences in emissivity between these zones at any of the three shear velocities tested.[17]

These results suggest that the very low emissivity of the Plover Exclosure observed in September 2022 was, in fact, a temporal effect rather than a true spatial difference; when measured simultaneously, the Plover Exclosure and NRA have the same emissivity. For this reason, the **Plover Exclosure should be modeled using the same emissivity profile as the NRA and using the same profile in the contemporary and pre-disturbance scenarios.**[18] Either the NRA Central or NRA South could be used—the choice should have minimal effect on the outcome as the net effect will be to largely "cancel out" the contribution of the area from the calculation of the change in emissions between the contemporary and pre-disturbance scenarios.[19]

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[16] The Krustal-Wallis test is a non-parametric analog to a one-way ANOVA and, equivalently, an extension of the Mann-Whiteny U test to more than two groups.

[17] For u_* = 0.381 m/s, Chi square = 0.69, p-value = 0.71, df = 2; for u_* = 0.534 m/s, Chi square = 2.42, p-value = 0.28, df = 2; and for u_* = 0.607 m/s, Chi square = 1.98, p-value = 0.37, df = 2.

[18] The District acknowledges that our Final Conditional Approval letter for the 2022 ARWP required that "When modeling emissions from the permanent closure of the Plover Exclosure area, the emissivity grid shall be derived from actual PI-SWERL measurements conducted since it was permanently closed." This requirement was based on the data available at the time (or lack thereof); data collected since then supports the approach outlined here. Furthermore, this requirement applied only to the work undertaken pursuant to the approved 2022 workplan and, thus, is no longer in effect.

[19] The contribution is "largely" but not completely cancelled out because there are small differences in the vegetation masks between the contemporary and pre-disturbance scenarios.

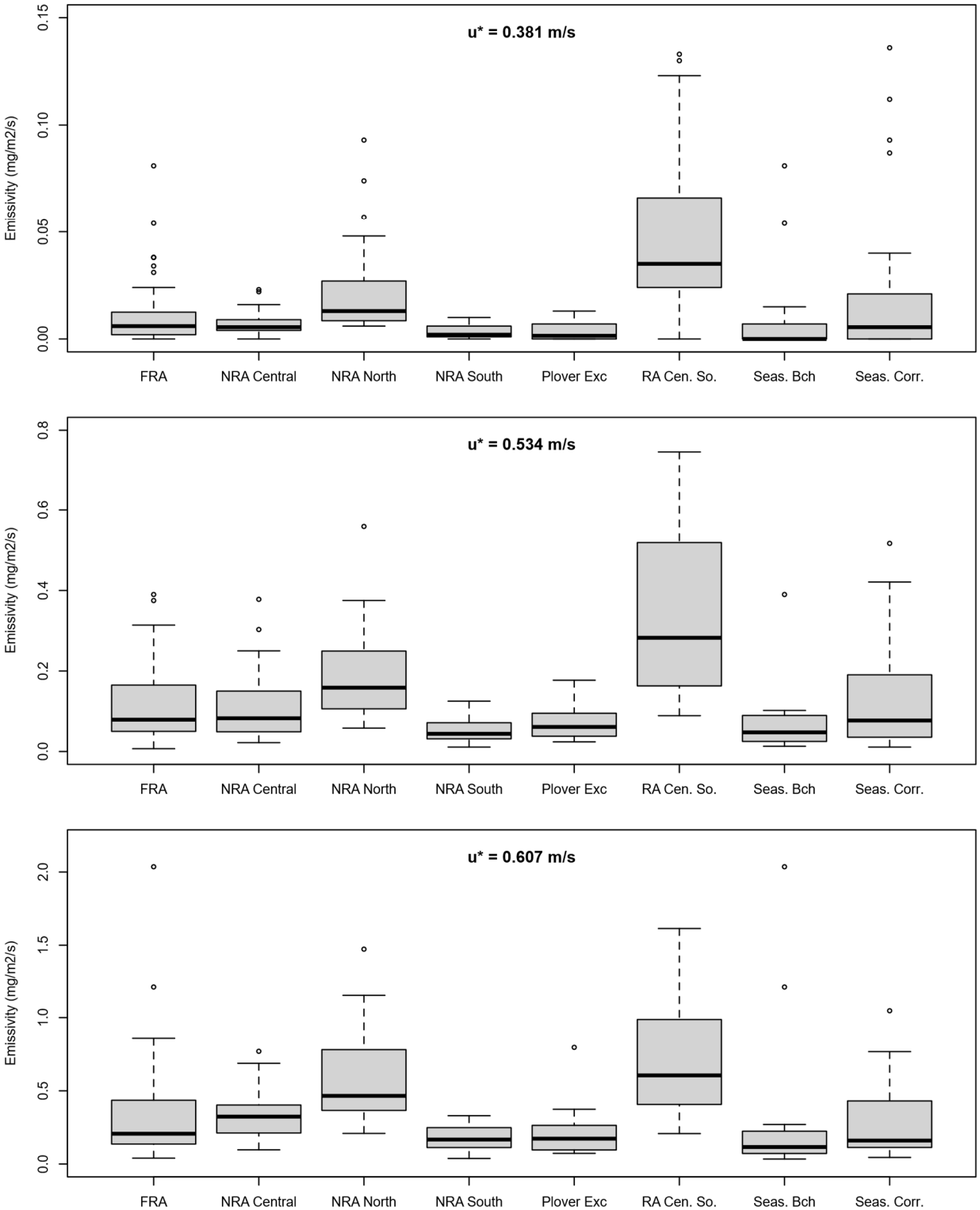

Figure 1: Emissivity Measurements from the Sept 2024 Campaign by Zone. One outlier from the Riding Area Central South has been excluded from plotting for clarity; it remains incorporated in the calculation of the median and other percentiles. FRA = Foredune Restoration Area, NRA = Non-Riding Area, RA Cen. So. = Riding Area Central South, Seas. Bch = Seasonal Beach, Seas. Corr. = Seasonal Corridor.

Up to now, the NRA Central emissivity profile has been used for the area in the pre-disturbance scenario, but the results of September 2024 PI-SWERL campaign suggest that the NRA South might be more representative.

Emissivity of Other Closed Areas

The District continues to have reservations about the modeling of the FRA as well. Like the Plover Exclosure, it is currently modeled assuming lower emissivity today than in pre-disturbance conditions, as shown ARWP Fig 2-33. As suggested by Figure 1 and confirmed by a Krustal-Wallis test, there is also no difference in emissivity between the FRA, NRA Central, and Seasonal Corridor when measured simultaneously.[20] Therefore, **in the contemporary scenario, the FRA should be modeled using the NRA Central emissivity profile, which is the same profile used for the area in the pre-disturbance scenario**.

The September 2024 campaign may also have implications for the Seasonal Exclosure assumptions. As noted above, there is no statistical difference in the emissivity between the Seasonal Beach zone and the NRA South, nor between the Seasonal Corridor and the NRA Central zone.

Supplemental Modeling Scenario

In last year's ARWP, a "supplemental modeling scenario" was included to address the District's concerns about the emissivity assumptions for the Plover Exclosure. The scenario used the same emissivity profile (i.e., NRA Central) for the Plover Exclosure in the contemporary and pre-disturbance scenarios. Under these assumptions, the emissions estimate from the area was 18 tons/day greater than the estimate employing the ARWP's preferred assumptions. See footnote B in Table 2-9 of the 2024 ARWP.[5] In the supplemental modeling scenario, emissions from the contemporary ODSVRA were still less from the pre-disturbance scenario, but the margin of compliance was drastically reduced. This finding was the basis for the District's tentative acceptance of State Parks' conclusion that no additional mitigations were warranted. As we wrote at the time:[4]

> *At the request of the District, State Parks undertook supplemental modeling in which [the Plover Exclosure] was modelled assuming the higher emissivity of the contemporary non-riding area. As noted in a footnote to ARWP Table 2-9, this supplementary modeling still found that emissions from ODSVRA are lower today than in the pre-disturbance scenario and thus no additional mitigations are needed to comply with the SOA. With these results and State Parks' plan to conduct additional PI-SWERL emissivity measurements in the Plover Exclosure this fall, the District tentatively agrees that no additional dust control projects are indicated at this time to comply with the SOA as amended.*

[20] For u_* = 0.381 m/s, Chi square = 0.23, p-value = 0.89, df = 2; for u_* = 0.534 m/s, Chi square = 0.016, p-value = 0.992, df = 2; and for u_* = 0.607 m/s, Chi square = 5.0, p-value = 0.08, df = 2.

No such supplemental modeling was included in the Draft 2025 ARWP, and without it we cannot approve the plan for 2025.

Until the supplemental modeling scenario is completed, it is unknown whether it will demonstrate compliance. However, a result can be estimated based on information in the ARWP. For the pre-disturbance scenario, the ARWP uses the NRA Central profile for the FRA and Plover Exclosure. Applying the *a* and *b* power function parameters from Table 5 of Attachment 05 of the ARWP, it is calculated that the NRA Central zone is 2.1 to 4.1 times more emissive than the Plover Exclosure over the relevant range of shear velocities (approximately 0.35 to 0.8 m/s). Compared to the FRA, the NRA Central zone is about 1.7 to 2.6-fold more emissive over this same range. It thus appears reasonable to assume that if the Plover Exclosure was modeled using the NRA Central profile rather than the Plover Exclosure profile, emissions from the area would increase by a factor of 3.1, i.e., the midpoint of the range of 2.1 to 4.1. Doing the same for FRA would increase emissions there by a factor of about 2.2.

These estimated changes in emissivity can be used to modify the emission estimates for the contemporary scenario reported in ARWP Table 2-8. This table reports an estimated 5.0 tons/day of emissions from the Plover Exclosure in the contemporary scenario—if emissions were higher by a factor of 3.1, then emissions would be 15.5 tons/day. Similarly, FRA emissions would increase by a factor 2.2, from 0.9 to 2.0 tons/day. The net result is an estimated increase of 11.6 tons/day in emissions for the contemporary scenario. **Thus, the supplemental modeling scenario would likely still show State Parks as being in compliance with the goal of the SOA, but the "buffer" will likely shrink by about 11.6 tons/day from 12.7 tons/day to approximately 1.1 tons/day.**

Reopening of the Plover Exclosure

As noted in the ARWP, reverting a portion of the Plover Exclosure to seasonal management will result in increased emissions. The ARWP proposes to account for this by modeling the area using an emissivity profile that represents a weighted average of the assumed emissivity of the area in the open and closed periods. The area is proposed to be open to vehicular access and camping for approximately 5 months per year and closed for the other 7, so the relative weights of the riding and non-riding components in the average are 5/12 and 7/12, respectively.

The District is supportive of this approach. When reopened to vehicular access, the emissivity of the area is not likely to change immediately from the level assumed for the non-riding period to the level assumed for riding period, nor vice versa when it is closed again in the spring, but the error incurred in assuming an immediate transition is likely small. It is, however, critical to assume proper emissivity profile for the riding-influenced and closed periods.

Regarding these emissivity profiles, the District notes that if the NRA Central profile is used to represent the closed period, and the Riding Area (RA) Central South profile is used for the open period, then the resulting weighted average is very close to the profile proposed in the ARWP, as shown in Table 1, below. For this reason, the District supports the emissivity profile proposed for this area in the ARWP.

Table 1. Power Relation Data for the Seasonal Plover Exclosure

Shear (u_*; m/s)	Median Flux (**F**, mg m^{-2} s^{-1})			
	NRA Central[a]	RA Central South[a]	Weighted Average[b]	ARWP Proposal[c]
0.381	0.015	0.024	0.019	0.021
0.534	0.150	0.317	0.220	0.248
0.607	0.461	0.752	0.581	0.566

[a] From Table 5, Attachment 05 to the 2025 ARWP. [b] 5:7 weighted average of the previous two columns; see text. [c] From Table 3-1 of the 2025 ARWP.

We note that if the lower NRA South emissivity profile is used for the 7-month closure period instead of the NRA Central, then the weighted average would be even lower—in fact, with median flux values of 0.011, 0.185, and 0.460 mg m^{-2} s^{-1} at the 3 standard shear velocities, it approximates the NRA Central emissivity profile. The District could support using this profile for the Seasonal Plover Exclosure, but only if the NRA South profile is assumed in the contemporary scenario for the portion of the Plover Exclosure that remains closed year-round, and the NRA South profile is also assumed for the entire Plover Exclosure in the pre-disturbance scenario.

As noted previously, the "supplemental modeling scenario" is likely to show that the ODSVRA as currently managed attains the emissions reduction goal of the SOA, albeit by a narrow margin (estimated to be 1.1 tons/day with the Plover Exclosure modeled with the NRA Central in the current and pre-disturbance scenarios). The proposed seasonal reopening of 100 acres of the Plover Exposure will increase emissions and could result in the ODSVRA no longer attaining the goal. **An approvable ARWP must include additional supplemental modeling which estimates the effect of the proposed seasonal management of the Plover Exclosure. This modeling must assume the same NRA emissivity profile for 1) the pre-disturbance scenario, 2) the portion of the Plover Exclosure remaining closed year-round, and 3) the profile used to represent the closed period in the weighted average profile for the seasonally managed portion of the Plover Exclosure.**

Until completed, it is unknown whether this additional supplemental modeling will demonstrate compliance with the SOA. However, a result can be estimated based on information in the ARWP. As discussed previously, if the NRA Central emissivity profile is assumed for the entire Plover Exclosure in both the contemporary and pre-disturbance scenario, then its emissions are likely on the order of 15.5 tons/day. According to the data

in ARWP Table 3-2, the footprint of the 100 acres to be reopened is responsible for about 30% of the emissions from the entire Plover Exclosure area.[21] Thus, 30% or about 4.7 tons/day of the 15.5 tons/day of emissions from the entire Plover Exclosure are from the footprint of the 100-acre portion planned for reopening. If, under seasonal management, the emissivity of these 100 acres is increased from the assumed NRA Central profile to the ARWP Proposal (i.e., with power relation parameters of a = 14.748 and b = 6.528), then emissions will increase by approximately 40%.[22] Thus, returning 100 acres of the Plover Exclosure to seasonal management is estimated to increase emissions by 1.9 tons/day (i.e., 40% of 4.7 tons/day).

This is, admittedly, only a rough estimate and does not substitute for actually performing the additional supplemental modeling as outlined above. Nonetheless, the estimated 1.9 ton/day increase in emissions is greater than the 1.1 ton/day "buffer" estimated for the supplemental modeling scenario in the previous section. This suggests that additional, offsetting dust controls will be necessary if a portion of the Plover Exclosure is reopened as planned. **If the additional supplemental modeling shows the ODSVRA will not be in compliance with the goal of the SOA, then additional dust controls, sufficient to achieve compliance, will need to be included in the ARWP.**

Furthermore, the Plover Exclosure is upwind of the Mesa2 monitor, so the planned reopening will likely affect PM_{10} levels there more than at CDF. Therefore, new dust control projects needed to offset the reopening should be located upwind of Mesa2, i.e., within the southern portion of the ODSVRA. We note that the approved 2022 ARWP[23] identified 47.5 acres of "secondary" dust controls, which were later determined to be unneeded, and thus were never installed. Some of the identified projects are upwind of Mesa2 and could be repurposed to offset Plover Exclosure-related emission increases, if needed.

Accuracy of the Vegetation Mask

In the comments on last year's ARWP, the District stated:[4]

> *Modeling areas of open sand as if they are vegetated and thus non-emissive could underestimate their emissions. For these reasons, the District suggests that future*

[21] Table 3-1 reports emissions of 5.0 ton/day of emissions for the entire Plover Exclosure under the current scenario of year-round closure. Under the proposed seasonal management scenario, it reports 3.5 tons/day for the portion remaining closed. As no change in management is proposed for this area, its emissions under the current scenario must also be 3.5 tons/day, so emissions from the other portion must therefore be 1.5 days/day, or 30% of the total emissions from the entire Plover Area.

[22] At the middle shear velocity ($u_* = 0.534$ m/s) the ratio of these emissivity profiles is 1.62, and at the high shear velocity ($u_* = 0.607$ m/s) the ratio is 1.23. The midpoint is about 1.4, or a 40% increase.

[23] California Department of Parks and Recreation, Off-Highway Motor Vehicle Recreation Division, "Oceano Dunes State Vehicular Recreation Area Dust Control Program: 2nd Draft 2022 Annual Report and Work Plan," September 14, 2022. Available online at https://storage.googleapis.com/slocleanair-org/images/cms/upload/files/2ndDraft2022ARWP_2022914.pdf.

> *modeling consider refining the shape of the vegetations islands, perhaps using more recent aerial photography. Non-vegetated portions (which are closed to vehicles) should be modeled assuming non-riding area emissivity rather than assuming they are completely non-emissive.*

The 2025 AWRP includes Attachment 09, "Recent (2020-2024) Changes in Vegetation Cover within the Oceano Dunes SVRA" which is a thorough documentation of the locations of both vegetation cover and straw cover within the ODSVRA as of 2024. The vegetation mask used for the modeling in the ARWP incorporates the results of this study.

As discussed in Section 2.3.2.2 of the ARWP, areas modeled as non-emissive include "the vegetation cover mask from 2024 [i.e., Attachment 09] **as well as** the vegetation islands and vegetation dust control projects as of July 31, 2025. [emphasis added]." The District agrees that all areas identified as vegetated or covered in straw in Attachment 09 should be treated as non-emissive, but we have concerns about certain other vegetation islands and dust control projects that are depicted as non-emissive in Figure 2-33, right panel. Specifically, dust control areas 2022-VG-01 and 2022-VG-02 (dust control program ID numbers 51 and 52, respectively, in ARWP Figure A01-01) are shown as non-emissive in ARWP Figure 2-33, right panel. These areas were not identified as vegetation or straw in Attachment 09 (see Figures 3 and 6), nor have they been subject to recent (nor planned) supplemental planting. Furthermore, recent satellite imagery available via Google Earth suggests that for these areas the vegetation/straw coverage is much less than 50%; therefore, it does not appear to be appropriate to assume these areas are completely non-emissive.

While these areas may eventually be sufficiently vegetated to be non-emissive, for now it is more appropriate to assume the NRA Central emissivity profile for them under the contemporary scenario. According to ARWP Table 2-8, in the pre-disturbance scenario, the 1,922.2 acres modeled with the NRA Central profile emitted 91.4 tons/day, or an average of 0.048 tons/acre-day. For the contemporary scenario, the average is 0.045 tons/acre-day. Assuming the lower average, the 25.9 acres comprising 2022-VG-01 and 2022-VG-02 are thus estimated to emit approximately 1.2 ton/day when the NRA Central profile is assumed.

The revised ARWP should either include evidence that these areas are properly represented as non-emissive, or otherwise model them as emissive (i.e., assuming the NRA Central emissivity profile) in the supplemental modeling. New dust controls or replanting of the area would need to be added to the plan if non-compliance with the ARWP is demonstrated.

Summary

The 2025 ARWP documents the successful completion of the activities planned in last year's ARWP, including model improvements and additional characterization of surface emissivity and vegetation cover. The District is supportive of most of the activities planned for the next year. We remain skeptical of certain assumptions, and as such we cannot agree with State Parks' assessment that the emission reduction goal of the SOA has been achieved.

Notably, the ARWP proposes reopening a portion of the Plover Exclosure to seasonal vehicular activity and camping. The District encourages State Parks to rethink this plan. As documented in various Annual Air Quality Reports prepared by the District,[24] as well as in State Parks' various ARWPs, there has been substantial progress toward achieving compliance with the goal of the SOA—so much so, that current emissions are estimated to be very close to pre-disturbance emissions. Depending on the assumptions employed, emissions are now likely somewhere between 12.7 tons/day less than pre-disturbance emissions, or perhaps a few tons/day over pre-disturbance emissions. The proposed seasonal reopening will increase emissions, threatening to undo progress made to date. The District is not convinced that the ODSVRA will be in compliance with the SOA under the proposal.

The District recognizes that reopening some of the Plover Exclosure to seasonal use is a high priority for State Parks as it will increase camping capacity and enhance the user experience. In the face of uncertainty about meeting the SOA goals, State Parks may wish to consider installing additional new dust controls in other areas of the park that will more than offset the estimated emissions from any proposed reopening. This way, compliance with the SOA will be more assured, even if some assumptions turn out to be wrong, and contemporary emissions are underestimated. In other words, in the face of significant uncertainty around emissivity profiles and changes in vegetation, the best way to ensure that the goal of SOA is truly met is to build in a margin of error into the plan—specifically, to install more offsetting dust controls than the modeling indicates are needed to exactly balance current and pre-disturbance emissions. This way, even if emissions are eventually determined to be higher than assumed, they may still be lower than pre-disturbance emissions, ensuring compliance. These new, offsetting dust controls should be upwind of Mesa2, and could be in areas of the park that contribute less to the overall visitor experience than the Plover Exclosure area.

[24] See for example, Appendix A of the 2024 Annual Air Quality Report (Reference 9). All Annual Air Quality Reports are available on the District's website at https://www.slocleanair.org/library/air-quality-reports.php.

To recap other items in this letter:

- Per State Parks' commitment in their 2024 ARWP and the District's Conditional Approval thereof, if any of the Plover Exclosure is reopened to public vehicular access prior to the final approval of the 2025 ARWP and without installing additional dust controls to offset the emissions increase, then State Parks will be in violation of the SOA. The afternoon of October 15, 2025, is the soonest that the 2025 ARWP could be approved.
- An approvable ARWP will include a "supplemental modeling scenario," akin to the one included in the 2024 ARWP, with the following features:
    - The Plover Exclosure is modeled using the same emissivity profile in both the contemporary and pre-disturbance scenario.
    - The FRA is modeled using the same emissivity profile in both the contemporary and pre-disturbance scenario.
    - The Seasonal Exclosure zone may be adjusted similarly.
    - In the contemporary scenario, the 2022-VG-01 and 2022-VG-02 project areas should be modeling assuming the NRA Central emissivity profile, unless additional evidence is provided to support an assumption that these areas are non-emissive (i.e., >50% vegetation/straw coverage).
- If reopening some of the Plover Exclosure is proposed, additional supplemental modeling must be included which starts with the supplemental modeling scenario identified above and then modifies it to account for the increased emissions expected from the reopening.
- If any supplemental modeling indicates that current emissions (and/or future emissions with seasonal management of the Plover Exclosure) are greater than pre-disturbance emissions, then additional dust controls will need to be included for the plan to be approvable. These controls should be upwind of Mesa2, as the opening will impact this receptor directly.
- State Parks should revise the plan for supplemental planting, focusing on the area upwind of Mesa2 and including more total acreage.

Finally, SAG provided their comments on the 2025 ARWP on August 29, 2025.[25] While the District does not agree with the SAG that the evidence in the ARWP for achieving the SOA emission reduction goal is "convincing", we do agree with all of their other comments and revision requests. State Parks should revise the ARWP accordingly. We also note that some data in Table 3-1 is incorrect and the section numbering in the Table of Contents does not match the numbering in the document itself, at least in the third section.

[25] Scientific Advisory Group, "Memo: SAG Review of '2025 ARWP_APCDDraft_20250815'," August 29, 2025. Available online at https://storage.googleapis.com/slocleanair-org/images/cms/upload/files/SAG%20Memo%20-%20SAG%20Review%20of%202025%20ARWP%20%28August%2015%20version%29_20250829.pdf.