APCD STAFF REPORT
PETITION FOR ABATEMENT ORDER
Case Number: 17-01

Executive Summary

Between May 2012 through March 2017, the San Luis Obispo County Air Pollution Control District (APCD) has received over 130 complaints from residents downwind of the Oceano Dunes State Vehicular Recreational Area (ODSRVA) regarding airborne particulate matter (dust). Numerous scientific studies performed by APCD and the Off-Highway Motor Vehicle Recreation Division of the California Department of Parks and Recreation (OHMVR or State Parks) have documented the ODSVRA as the source of the dust, and the vehicle activity on the dunes as the major contributor to those emissions. Historical ambient air monitoring on the Nipomo Mesa has documented elevated concentrations of airborne particulate matter that are far higher than other areas of San Luis Obispo County and other coastal areas of California. These historical measurements show the California health standard for PM_{10} (airborne particles with a mean aerodynamic diameter of 10 microns or less) is regularly exceeded in many locations on the Nipomo Mesa.

During the period of complaints received, 605 exceedances of State health standards for particulate matter (PM10) and 7 exceedances of federal PM10 standards have been recorded collectively at the CDF, Mesa 2 and Nipomo Regional Park (NRP) monitoring sites located on the Mesa downwind of the ODSVRA. Complainants state the level of airborne particulate they experience is unhealthy, creating an injurious environment and impacting their ability to go outdoors and enjoy their homes or property or participate in outdoor activities in their neighborhoods. Complainants further state they associate difficulty breathing, respiratory issues, exacerbation of pre-existing conditions such as asthma and Chronic Obstructive Pulmonary Disease (COPD), watery and stinging eyes and other health impacts with exposure to airborne particulate matter from the ODSVRA.

To address this issue, Rule 1001, *Coastal Dunes Dust Control Requirements*, was adopted by the APCD Board in November 2011. The Rule sets forth certain planning, mitigation and air monitoring requirements with goal of reducing particulate pollution on the Mesa to levels that would typically occur without the soil disturbance created by the vehicle activity on the Dunes. Unfortunately, in the six years since Rule adoption, the dust control measures implemented by OHMVR to date have not produced any measurable reductions in downwind PM10 levels measured on the Mesa.

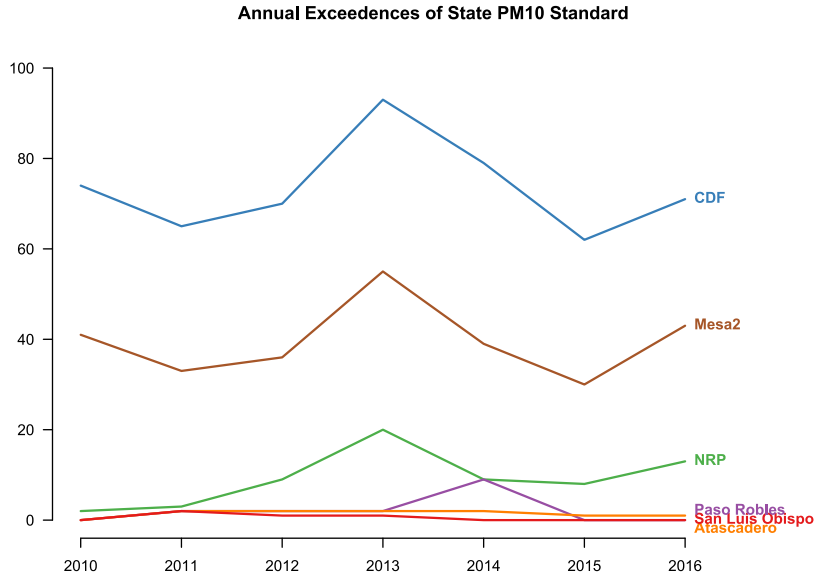
The large number of resident complaints received by APCD, and the ongoing exceedances of state health standards measured in the neighborhoods where they live, clearly constitute a nuisance and substantial health risk that must be abated. The PM10 emissions that form the basis of the nuisance have been well documented as emanating from the ODSVRA. The only argument OHMVR can make in their defense is that these emissions are natural, that OHV activity has not made the problem any worse, and/or there's nothing they can do to control it. This argument has already been tried in court on two separate occasions, with the court upholding both the viability and need for the Rule to protect public health, and the science behind it.

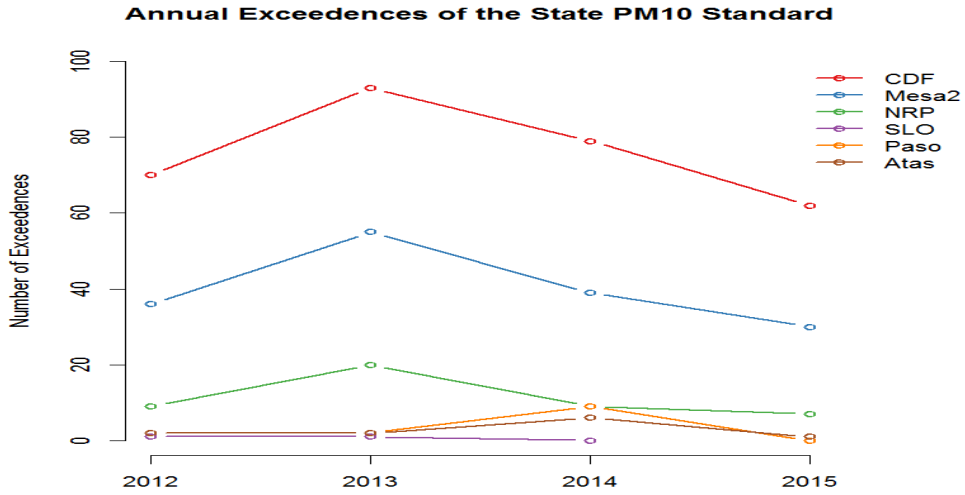
Based on all the evidence presented in this report and at public hearing, the APCD requests the Hearing Board to find that the ODSVRA facility operated by OHMVR is causing a public nuisance and to issue an Abatement Order to provide relief for affected residents.

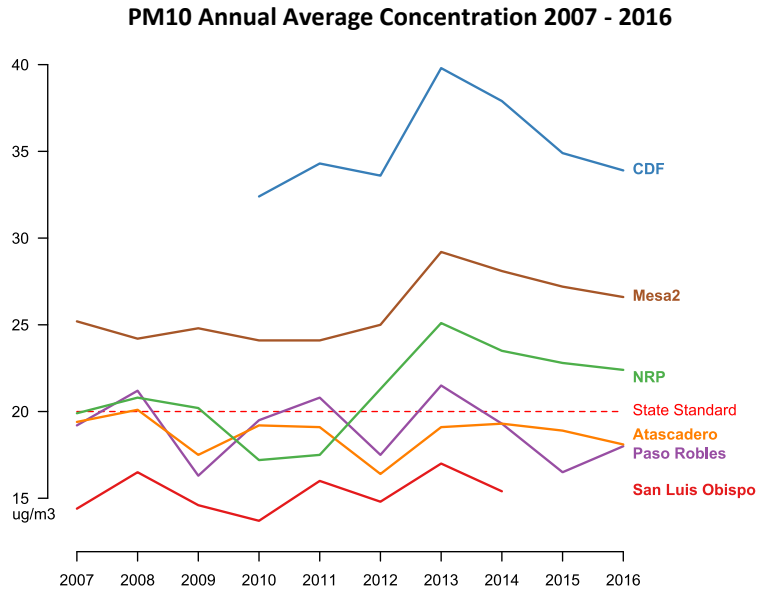
NATURE OF THE PROBLEM

Population-based studies in hundreds of cities in the U.S. and around the world have demonstrated that both short-term and long-term exposure to elevated particulate levels can cause significant increases in hospital admissions, emergency room visits, upper respiratory and cardiopulmonary symptoms and disease, and premature deaths. Groundbreaking long-term studies of children's health conducted in California have also shown that particle pollution may significantly reduce lung function growth in children.

Historical ambient air monitoring on the Nipomo Mesa has documented elevated concentrations of airborne particulate matter that are far higher than other areas of San Luis Obispo County and other coastal areas of California. These historical measurements show the California health standard for PM_{10} (airborne particles with a mean aerodynamic diameter of 10 microns or less) is regularly exceeded in many locations on the Nipomo Mesa compared to other areas of the county, as shown in the following charts:







Numerous scientific field studies and data analyses have been performed by the San Luis Obispo County Air Pollution Control District and the Off-Highway Motor Vehicle Recreation Division of the California Department of Parks and Recreation to evaluate the nature and source of the elevated particulate pollution levels measured on the Nipomo Mesa. The following sections describe the results and findings of several of those studies, with references to the full study reports, each of which has been provided to the Hearing Board in full as Exhibits. A White Paper prepared by APCD's Air Quality Consultant (Exhibit 6) informatively summarizes the key aspects and salient findings for all the scientific studies discussed and referenced below.

APCD Studies

Phase 1 South County Particulate Matter Study

To better understand the extent and sources of these unusually high concentrations of particulate pollution on the Nipomo Mesa, the San Luis Obispo County Air Pollution Control District (SLO APCD) has conducted several comprehensive air monitoring studies in that region. The *2007 Phase 1 South County Particulate Matter Study* (Exhibit 1) began in 2004 and utilized filter-based manual particulate samplers measuring both PM_{10} and $PM_{2.5}$ (particles 2.5 microns in diameter or less) concentrations at 6 monitoring sites located throughout the Mesa. Samples were collected over a one-year period and analyzed for mass and elemental composition; meteorological measurements of wind speed and direction were also performed at numerous locations in the study area.

Data from the Phase 1 study showed air quality on the Nipomo Mesa exceeded the state 24-hour PM_{10} health standard at one or more monitoring locations on over one quarter of the sample days. Elemental analysis of $PM_{2.5}$ filter samples demonstrated that on these high particulate days, the largest fraction of particles were composed of windblown crustal material containing silicon, iron, aluminum, and calcium. Meteorological data showed that high wind events entraining crustal particulate from the dune fields at the Oceano Dunes State Recreational Vehicle Area (ODSRVA) upwind of the Nipomo Mesa area and transporting them inland as the likely cause; data from a directional PM_{10} sampler on the Mesa that only operated on high wind days strongly supported this conclusion. Further analysis of Phase 1 study data was unable to provide a conclusive determination on whether off-road vehicle (OHV) activity in the ODSVRA played a role, either direct or indirect, in the particulate pollution observed on the Nipomo Mesa. As a result, the APCD Board directed staff

to conduct an additional field study to determine if OHV activity played a role in the high PM levels measured on the Mesa.

Phase 2 South County Particulate Matter Study

To help design and conduct the Phase 2 study, the SLOAPCD retained the services of the Delta Group, an affiliation of scientists, mostly from the University of California at Davis (UCD), dedicated to the detection and evaluation of aerosol transport. The Great Basin Unified Air Pollution Control District (GBUAPCD), a recognized leader nationwide in understanding and mitigating windblown particulate pollution, also lent their considerable expertise to the design and implementation of the study. Scientists from the Santa Barbara County APCD, the California Air Resources Board (CARB) and the Off-Highway Motor Vehicle Recreation Division of the California Department of Parks and Recreation (OHMVR, or State Parks) also provided significant input into the design of the Phase 2 study.

The Phase 2 Study design involved three independent investigations using a broad array of technologies and measurement techniques to better understand the source(s) and activities responsible for the observed PM levels on the Nipomo Mesa. Determining the role of OHV activity on the ODSVRA was a key focus of the study, so it was important to conduct measurements and analyses both within and downwind of the riding areas at the SVRA, as well within and downwind of "control site" dunes north and south of the SVRA where offroad vehicles are not allowed, to evaluate the differences between them. PM and meteorological measurements downwind of the refinery coke piles and agricultural fields on the Mesa were also a necessary design element to determine potential contributions from those areas. Further, since the Phase 1 study showed that elevated PM concentrations on the Mesa occur primarily on high wind days, it was critical to ensure that study measurements captured the high wind events that typically occur during the early spring and late fall months.

The field measurement phase of the study was conducted from January 2008 through March 2009. The portion of the study performed by the SLOAPCD entailed the deployment and use of real–time particulate monitors and wind sensors at a variety of locations downwind of both the SVRA and the control sites, as well as downwind of the coke piles and agricultural fields. These measurements were designed to assess the relative levels of airborne particulate coming from those areas, particularly on high wind days.

The portion of the study directed by the GBUAPCD involved measuring the amount of sand movement at different wind speeds, both in the riding and nonriding areas of the ODSVRA, to better understand the mechanism and potential source location responsible for windblown emissions. The Delta Group was responsible for deploying and operating sophisticated research sampling instruments designed to measure the mass, size distribution and elemental composition of the particulate pollution. These samplers were located downwind from several riding areas at the ODSVRA as well as at a number of control sites that do not allow OHV activity. The samplers were also used to look for tracer elements to assess if petroleum coke from the Phillips 66 refinery facility was being entrained by winds and impacting ambient PM levels in the area. The Delta Group also collected and analyzed soil samples upwind from each monitoring station.

The *2010 South County Phase 2 Particulate Study* (Exhibit 2) showed that PM_{10} concentrations downwind of the riding areas are significantly higher than those measured downwind of nonriding areas. As shown below in Figure 3.54 from that study, average PM_{10} levels measured at both the CDF and Mesa2 monitoring sites downwind of the riding areas were more than twice as high as those measured at the Oso site downwind of a nonriding area. These differences were measured despite the Oso site being considerably closer to shore and subject to much stronger winds than either the CDF or Mesa2 sites. Analysis of PM10 filters ruled out sea salt and the coke piles at the refinery as sources; the analysis was consistent with the source being the ODSVRA.

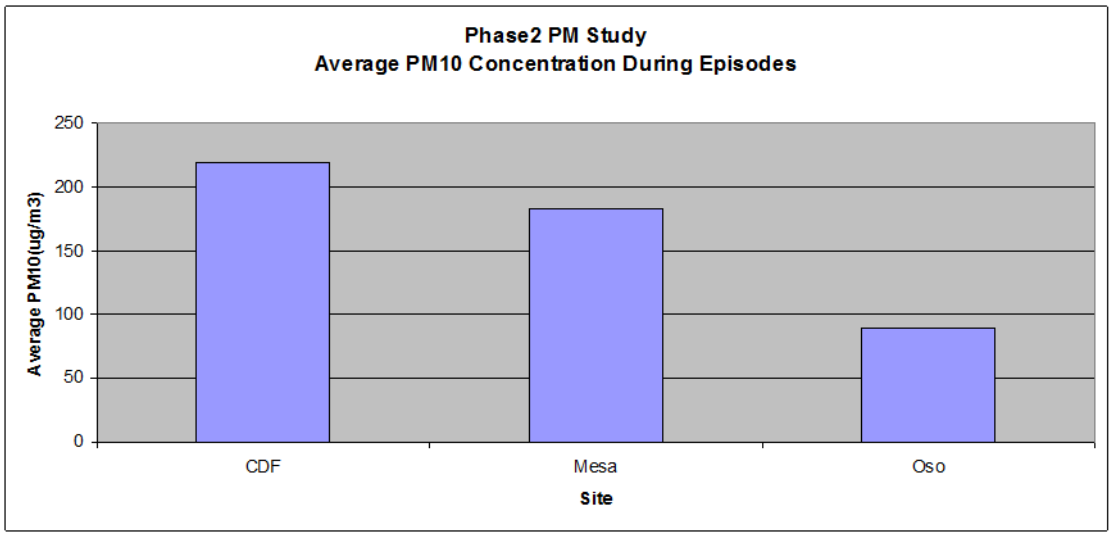


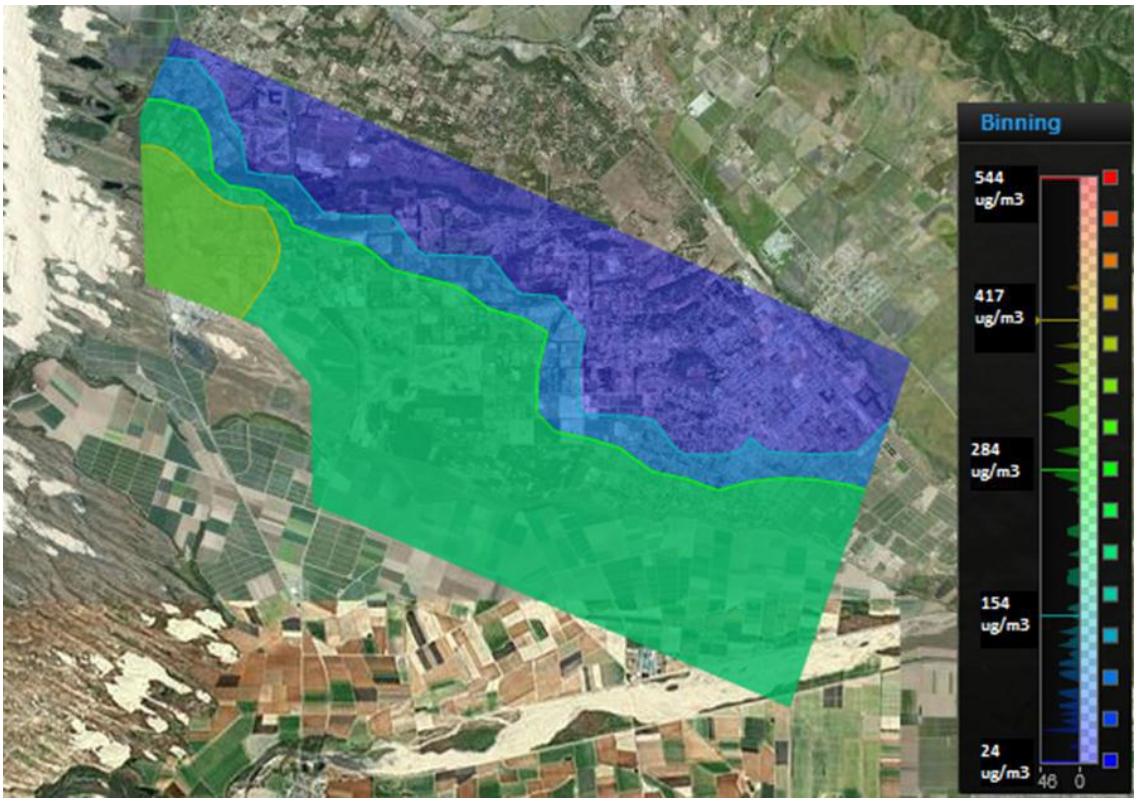
Figure 3.54 – Comparison of Average Downwind PM_{10} Concentration During Episodes

South County Community Monitoring Project

The goal of this project was to map the spatial extent and concentration gradient of the ODSVRA dust plume to better understand its impacts on Nipomo Mesa and Oceano neighborhoods. The data collected was intended to facilitate the preparation of more detailed air quality forecasts for those areas and enhance the ability of affected residents to individually determine if or when protective actions might be needed on high PM days. Better knowledge of the plume path and downwind concentrations would also help inform the development of dust controls at the SVRA.

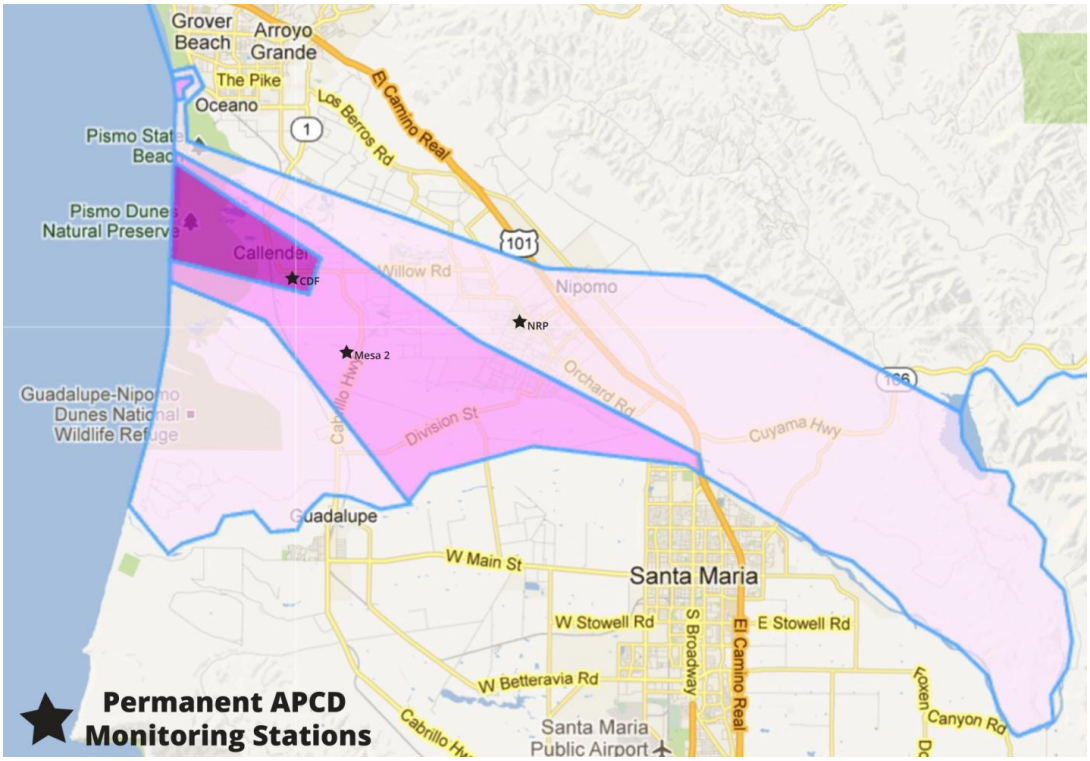
A saturation monitoring approach was utilized for this project with 23 semi-portable, real time beta attenuation (EBAM) PM10 monitors (many equipped with wind sensors), deployed across the Nipomo Mesa, as well as near the beach and adjacent to Pier Avenue in Oceano. These monitors gathered data during the months of March through May 2012 to capture the period known to have the highest winds and prevalence of dust episodes. The *South County Community Monitoring Project Report, January 2013* (Exhibit 3) describes the results of this study.

The data gathered from the Nipomo Mesa study area provides a detailed and comprehensive picture of the path, concentration gradient and influence of different wind conditions on the dust plume. Most dust episodes showed a remarkable similarity in plume extent and concentration gradient, with the main variable being the severity of the event. Figure E-1 from the Report below presents a visualization of the typical plume pattern observed on the Mesa.



While the pattern of PM10 concentrations depicted above is typical for most wind/dust events, some subtle differences were noted on specific episodes. The most significant variable in episodes appears to be changes in wind direction as the plume moves inland. Wind data shows that during the strong northwest winds when the dust events typically occur, the wind direction is quite constant near the coast, resulting in only small changes in the plume characteristics on the western portion of the Nipomo Mesa. However, the wind direction farther inland becomes much more variable, resulting in more variations in the plume path as one moves inland. For example, it is not uncommon for the wind direction five miles from the coast to shift more northerly, which results in a plume impact that is pushed in a more southerly direction with little to no impact in the northern portion of the Mesa. Conversely, particulate concentrations increase in the northerly portion of the study area when the wind direction inland is more westerly than on the coast. Analysis of the project data also demonstrated that the dust plume from the coastal dunes often extends inland to Santa Maria.

Detailed analysis of the study data and the particulate concentration relationships between each monitoring site under various meteorological conditions was used to generate more detailed forecast maps than previously possible for both the Nipomo Mesa and Oceano areas. Figure E-2 below defines the typical areal influence of the dust plume on the Nipomo Mesa during strong northwesterly winds. The APCD uses these maps to provide a numerical forecast of the Air Quality Index (AQI) for each forecast zone based on the approximate magnitude of the forecasted particulate concentrations. Each forecast zone is related to PM concentrations measured at the three permanent APCD monitoring stations on the Nipomo Mesa: CDF (Willow Road), Mesa2 (Guadalupe Road) and NRP (Nipomo Regional Park). Areas outside of the zones shown in these figures use the San Luis Obispo monitoring station for particulate air quality guidance. In terms of PM exposure for residents in these areas, the dark purple zone is the area of highest PM concentrations, followed by the dark pink zone and then the light pink zone. PM concentrations outside these three zones typically reflect background levels of PM similar to other areas of the county. Most of the complaints received regarding the dust nuisance come from residents in the dark purple and dark pink zones.



State Parks Studies

The OHV Division of State Parks measured very similar results as the APCD studies after performing extensive air monitoring studies in the Spring and Summer of 2013, the results of which are documented in the report prepared by their consultant, Desert Research Institute (DRI), titled: *Wind and PM_{10} Characteristics at the ODSVRA from the 2013 Assessment Monitoring Network, September 2014* (Exhibit 4). They installed monitoring equipment along 4 different transects in the ODSVRA in the direction of the prevailing northwest winds. Transect 1 was located in the Nature Preserve nonriding area at the north end of the SVRA; Transect 2 was located within the LeGrande Tract riding area; Transect 3 was located within the larger riding area south of the LeGrande tract; and Transect 4 was located in the nonriding area southeast of Oso Flaco Lake. As shown in Figure 47 from that report (below), PM_{10} levels measured at site 2C in the LeGrande tract riding area were far higher than all other sites, with PM_{10} levels measured at site 3C in the more southerly riding area being next highest. PM_{10} levels measured at sites 4B and 1C in the southerly and northerly nonriding areas were considerably lower than those measured in the riding areas, as shown in Figure 47 from that report.

During the State Parks 2013 monitoring study referenced above, DRI scientists also performed extensive analyses of soil emissivity throughout the ODSVRA using their patented PiSwerl measurement device. Over 350 measurements were performed to evaluate the relative emissivity of the riding areas and nonriding areas in the park. Their report, titled *2013 Intensive Wind Erodibility Measurements at and Near the Oceano Dunes State Vehicular Recreation Area: Preliminary Report of Findings, July 2014* (Exhibit 5), clearly shows the riding areas to be substantially more emissive than the nonriding areas, with the open sand in the LeGrande tract riding area up to 8 times more emissive than all nonriding areas combined, and up to 30 times more emissive than the open sand in the Oso nonriding area. The figure below, titled “Oceano Dunes PM10 Emissions”, graphically depicts the data presented in Table 2 of that report.

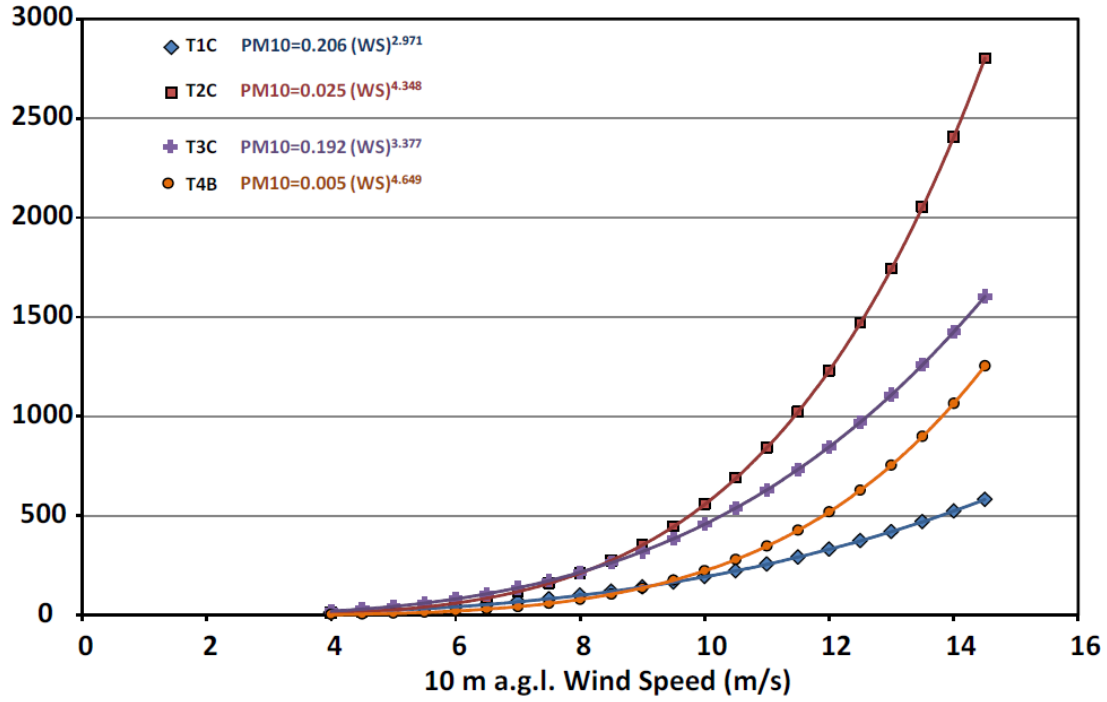
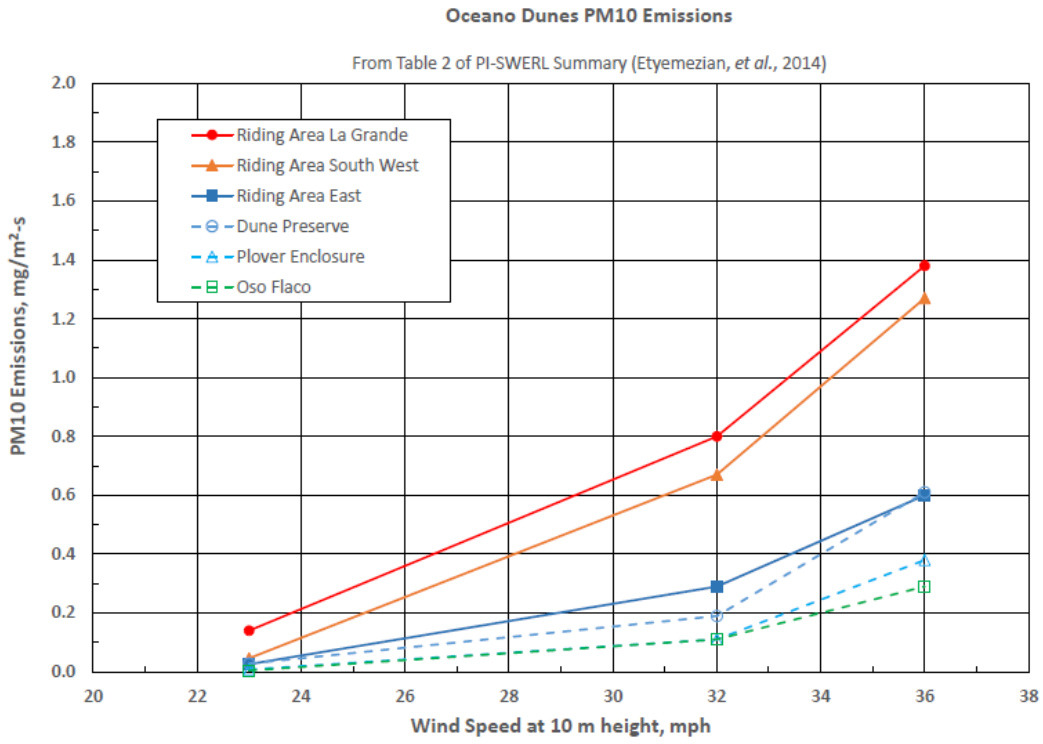


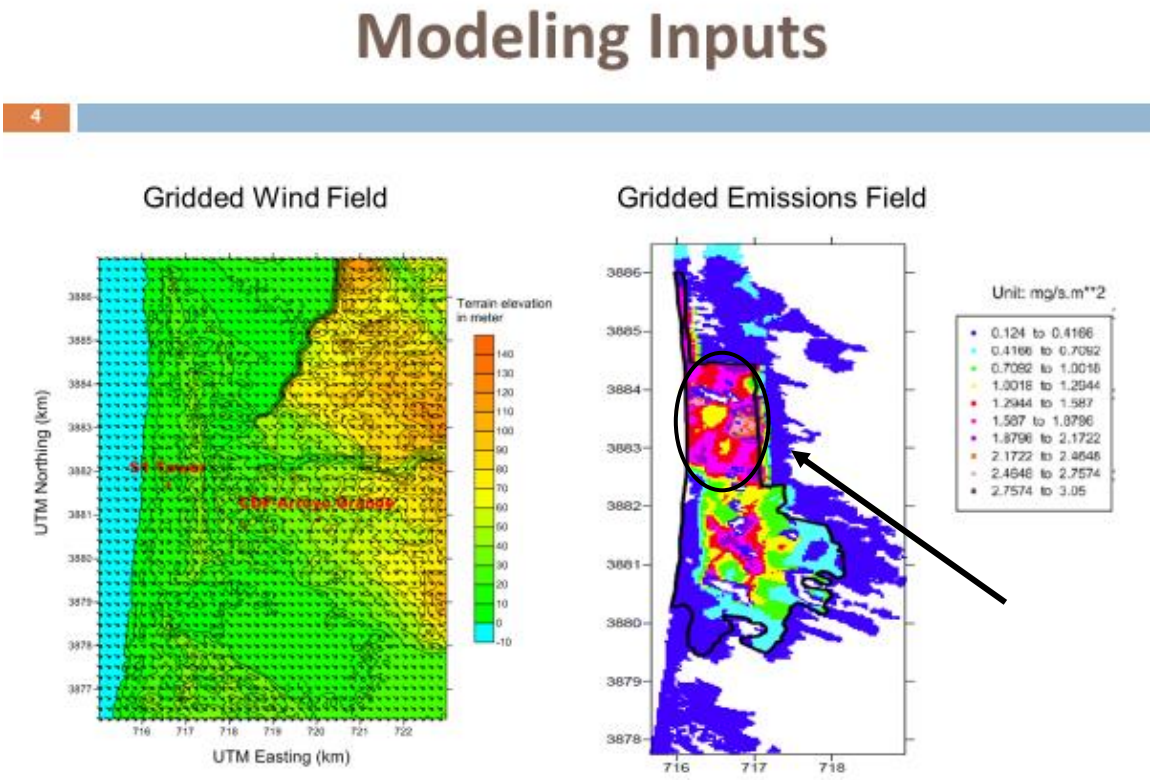
Figure 47. Relationships between mean 10 m hourly wind speed and PM_{10} for the four e-Bam measurement positions for the 292° winds (NB: no 10 m wind speed measured at position T3B).



California Air Resources Board Model Development and Analyses

The California Air Resources Board (CARB) has worked with APCD and OHMVR over the past few years to provide technical expertise and guidance in helping evaluate and develop appropriate solutions to this significant air pollution problem. As part of that process, CARB has developed a 3-dimensional atmospheric dispersion model that simulates emissions and wind conditions in the ODSVRA to estimate air quality impacts within the surrounding communities. The model is intended to help define the type, scope and location of dust control measures needed to protect public health and comply with Rule 1001. The modeling effort continues to evolve as new data becomes available and is currently being used to help design the dust control measures for the Spring 2018 windy season.

The CARB model has utilized much of the emissions and air quality data collected by DRI and APCD in the studies referenced above to develop and calibrate the model. The following graphic from a June 2017 CARB presentation to the APCD Board shows the gridded wind field and emissions field used in the model. As shown in the graphic, the dark blue color represents the least emissive zones in the ODSVRA, followed by light blue, green and yellow; the red, purple and brown colors represent the most emissive zones. As shown on the graphic, the most emissive area in the ODSVRA is the Le Grande tract (circled with arrow), where all of the camping and much of the riding occurs. Through the scientific studies referenced above and the CARB modeling efforts, the LeGrande tract has been determined to be the major source of emissions contributing to nuisance and public health threat impacting downwind residents on the Nipomo Mesa.



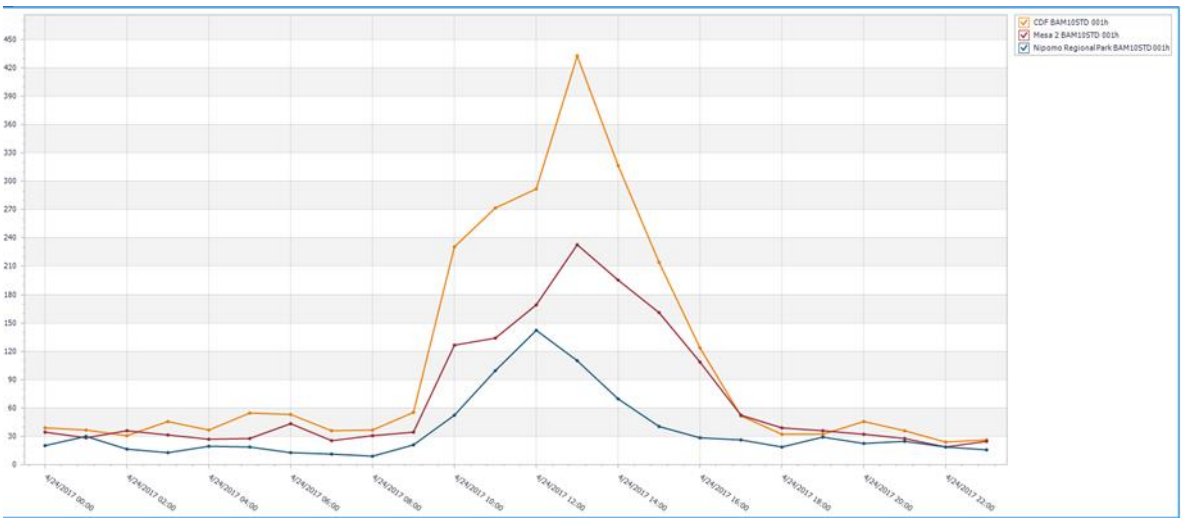
EVIDENCE FOR NUISANCE VIOLATION

Complaint History

APCD has received numerous complaints from residents downwind of the ODSVRA regarding airborne particulate matter (dust). The complainants attribute the origin of the dust to activities associated with off-road vehicle riding within the ODSVRA. Complainants state the level of airborne particulate is unhealthy, creating an injurious environment and impacting their ability to go outdoors and enjoy their homes or property, or to participate in outdoor activities in their neighborhoods. Complainants further state they associate difficulty breathing, respiratory issues, exacerbation of pre-existing conditions such as asthma and COPD, watery and stinging eyes and other health impacts with exposure to airborne particulate matter from the ODSVRA.

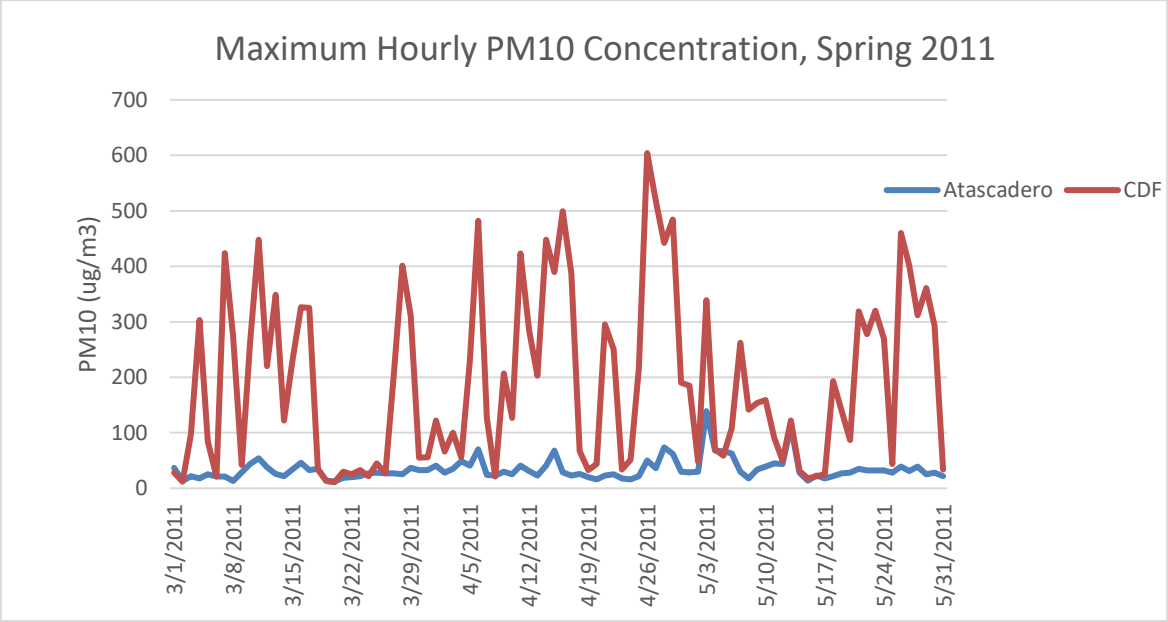
The Environmental Protection Agency and the California Air Resources Board have set standards for both coarse particulate matter (PM10) and fine particulate matter (PM2.5) to protect human health and the environment. Exposure to particulate matter can affect both the lungs and the heart, with well over a thousand scientific and epidemiological studies linking particle pollution exposure to a wide variety of significant health problems, including premature death in people with heart or lung disease; nonfatal heart attacks; irregular heartbeat; aggravated asthma; decreased lung function; and increased or exacerbation of respiratory problems such as irritation of the airways, coughing or difficulty breathing. People with heart or lung disease, children and older adults are the most vulnerable population groups to adverse health impacts from exposure to airborne particulate pollution.

Of significant public health concern are the very high hourly PM concentrations measured on the Mesa during high winds events that typically occur between 10am – 4 pm, as demonstrated in the chart below, which shows hourly PM10 values on 4/24/2017 for CDF (orange), Mesa2 (red), and Nipomo Regional Park (blue). The 24-hour average PM10 concentration at CDF was 105 µg/m3 on this day. This is the most active period of the day for both children and adults, who are often outdoors during these hours being physically active and exposed to these high levels of airborne particulate.



The chart below compares hourly PM10 concentrations measured in Spring of 2011 for the CDF site and our Atascadero monitoring site, which typically measures the highest PM levels of all our 7 other non-Mesa monitoring sites spread throughout the communities in the rest of the county. As can be seen, the hourly

concentrations at the CDF site during the windy season are typically an order of magnitude higher than those measured in Atascadero. The APCD and the County Public Health Department issue joint health advisories and alerts to the public when hourly concentrations exceed 170 ug/m3.



Complaints regarding dust from the ODSVRA have been documented since May of 2010, and are received in varying frequencies. Sometimes the complaints are isolated; at other times numerous complaints are made by residents over a series of days. The incident rate of complaints has fluctuated through the years with 19 complaints received in 2010, 4 in 2011, 9 in both 2012 and 2013, 7 in 2014, 8 in 2015, and increasing to 21 in 2016 and 78 to date in 2017. A total of 132 complaints have been received since District Rule 1001 was adopted in November 2011. Exhibit 7 provides a listing of the verified and documented complaints referenced above.

The APCD has registered complaints throughout most months of the year, except for November and December; the majority of complaints, however, are received between the months of March through June during periods of historically higher wind levels. Complaints are also often associated with days where measured particulate matter (PM) levels exceed state and/or federal health-based air quality standards, and/or periods defined as “unhealthy for sensitive groups” by the Environmental Protection Agency when the Air Quality Index (AQI) exceeds 100.

Air Monitoring Data Shows Frequent Exceedances of State Health Standards on the Mesa

The District monitors air quality throughout San Luis Obispo County, with multiple monitoring sites on the Nipomo Mesa downwind of the ODSVRA. These locations include CDF- Arroyo Grande (2391 Willow Road), Nipomo-Guadalupe Road (Mesa 2), Nipomo Regional Park (NRP), and the Oso Flaco Lake Road control site owned by OHMVR and operated by APCD; we also recently deployed a mobile monitoring station that measures PM levels at various other temporary locations on the Mesa downwind of the ODSVRA. A map of the stationary monitoring sites referenced above is shown below:

During the period of complaints received between May 2012 through March 2017, 605 exceedances of State particulate matter (PM10) standards and 7 exceedances of federal PM10 standards have been recorded collectively at the CDF, Mesa 2 and Nipomo Regional Park (NRP) monitoring sites (Exhibit 8). Preliminary data for the April 1, 2017 through September 17, 2017 timeframe indicates an additional 83 exceedances of state PM10 standards were collectively measured at these sites during this period, bringing the combined total to 688 exceedances recorded at all three sites over that period.

The high levels of PM10 recorded at the Nipomo Mesa sites downwind of the ODSVRA riding area during this period also frequently resulted in Air Quality Index readings above 100, defined by EPA as “unhealthy” for sensitive groups; these AQI readings are provided to the public daily to inform those potentially affected of current local air quality conditions and potential health effects that may be of concern. Short-term acute exposure to particulate matter includes adverse health impacts to even healthy members of the public, with sensitive populations at even higher risk, such as children, the elderly, those with existing heart or lung disease and those working or exercising outdoors. On numerous occasions during this period, the Air Now AQI system reported that Nipomo, California exhibited the highest hourly concentrations of particulate matter of any location in the United States, with AQI values in the “unhealthy for all individuals” range.

In addition to the above, APCD Rule 1001 requires OHMVR to monitor PM10 concentrations downwind of the riding area and downwind of a comparable nonriding area; this requirement is to ensure dust emissions that would normally occur in the absence of vehicle activity are accounted for in determining the downwind air quality impacts of vehicle activity at the facility. The CDF site has been designated as the riding area monitor, and the Oso Flaco Lake Road site has been designated as the nonriding area control site monitor. Section C.3

of Rule 1001 requires that, whenever 24-hr average PM10 levels measured at the riding area site (CDF) are 10% or more above State standard of 50 ug/m3 (i.e. – 55 ug/m3), the PM levels measured at the nonriding area monitor for the same period must be within 20% or less of the riding area monitor. Since the Oso control site monitor was installed on July 1, 2015, District staff have identified 120 days from then through September 17, 2017 where PM10 levels downwind of the ODSVRA have violated that performance standard (Exhibit 9).

Recognition of the Public Health Risk and Nuisance Impacts from the ODSVRA by Other Agencies
The U.S. Environmental Protection Agency (EPA), the California Coastal Commission (CCC), and the San Luis Obispo County Health Commission (CHC) have all weighed in on numerous occasions regarding the public health risks and nuisance issues created by uncontrolled particulate emissions from the ODSVRA.

In an April 15, 2015 letter from the Environmental Protection Agency (EPA) to SLO APCD (Exhibit 10) regarding implementation of Rule 1001 to control the emissions, EPA states:

> *"As you know, during the 2012-2014 time period, the District's CDF monitor, a required regulatory monitor near the Oceano Dunes, has reported seven air quality exceedances of the 2006 24-hour PM2.s and seven exceedances of the 24-hour PM0 national ambient air quality standards (NAAQS). This poses a serious health concern which the District has been attempting to address. According to the District's 2010 Phase 2 South County Particulate Study, these exceedances are attributable to vehicular disturbance of beach and sand dunes. These data suggest that the operation of vehicles on dunes is contributing to the exceedances of the NAAQS, which are intended to protect human health and the environment."*

In the Coastal Commission's March 29, 2017 approval letter to OHMVR (Exhibit 11) addressing their application to install the 2017 temporary dust controls, they state:

> *"….dust emissions emanating from the ODSVRA during the windy season constitute a critical public health hazard amounting to a public nuisance."*
>
> The CCC letter further states:
>
> *"The dust emissions are significant, considering that the Superior Court and the APCD have characterized them as 'unacceptably high', 'highly toxic', and a 'significant public health threat'. Additionally, the emissions are unreasonable because DPR can allow off-highway vehicle use (OHV) to continue within the ODSVRA riding area while still implementing reasonable, temporary mitigation measures…. to abate the serious harm caused by the dust emissions."*
>
> In summarizing their rationale for granting the approval, the CCC letter states:
>
> *"Considering the totality of the circumstances discussed above, the Executive Director determines under the specific facts presented in this case that DPR's 2017 Dust Mitigation Proposal does not require a CDP for the following reasons: (1) the temporary proposal (which otherwise constitutes regulable development) is mandated by the APCD in order to comply with Rules 402.A and 1001 for the purpose of abating a public health hazard/nuisance; (2) the development is narrowly targeted at abating the nuisance; and (3) the development is the minimum necessary to abate the nuisance."*

Similarly, a June 15, 2017 letter from the SLO County Health Commission to the SLO County Board of Supervisors (Exhibit 12), regarding the public health impacts of dust emissions from the ODSVRA dust, stated:

"Residents of the Nipomo Mesa who reside in the dust plume from the Oceano Dunes have again appealed to the Health Commission for help in protecting them from the on-going, unresolved, serious health consequences of exposure to airborne Particulate Matter (PM) blowing from the dunes…… Nipomo Mesa residents remain exposed to very serious acute, chronic, and cumulative health impacts, which many local medical professionals agree has compromised the health of downwind residents."

These other regulatory and knowledgeable local, state and federal agencies clearly recognize the dust emissions from the ODSVRA as a public health threat and nuisance to downwind residents impacted by high levels of course and fine particulate in the ambient air.

EFFORTS TO DATE TO RESOLVE THE NUISANCE

Rule 1001 Adoption and Implementation

Rule 1001, *Coastal Dunes Dust Control Requirements*, (Exhibit 13) was adopted by the APCD Board in November 2011. The Rule sets forth certain planning and air monitoring requirements with completion milestones to be met prior to the May 31, 2015 deadline established for achieving compliance with the Rule performance standard described above. To date, none of the requirements in Rule 1001 have been met within the timeframes required in the Rule, nor within the several extended timeframes subsequently agreed to by the agencies. Only one requirement in the Rule has been fully met, albeit 2 years late: the installation of the Oso Control Site monitor. Unfortunately, that monitor was later removed by OHMVR without notification or approval from APCD. While it was later reinstalled by OHMVR, this action ultimately resulted in APCD issuance of the Notice of Violation that included the citing of Nuisance. OHMVR now claims the Oso monitor is not appropriately sited to represent the Control site monitor, yet they have presented no convincing data to substantiate that argument. This specific issue is discussed in more detail further down in this document.

Several factors have contributed to the difficulty in successfully implementing and enforcing the Rule, including the initiation of several lawsuits against APCD and other agencies directly or peripherally involved with one or more implementation aspects of the Rule.

Lawsuits Filed Regarding Rule 1001 Adoption and Implementation

To date, Friends of the Oceano Dunes (FOD), an offroad vehicle lobby group, has filed at least eight separate lawsuits directly related to adoption and implementation of Rule 1001. APCD was directly sued in 3 of those suits, and named a Real Party in Interest in most of the others; OHMVR and the Coastal Commission are also the primary Respondent or named as Real Party in Interest in some of those suits. In all cases, the validity, viability and necessity of Rule 1001 has been upheld by the Courts. Nonetheless, the enormous amount of time, money and staff resources expended in responding to the lawsuits has taken a significant toll on APCD in trying to move forward with implementation of the Rule. This was a primary factor leading to development of the Consent Decree Agreement between APCD and State Parks, described below.

Consent Decree Agreement

In an effort to develop a more collaborative approach in implementing Rule 1001 and reduce the potential for additional lawsuits, the District and OHMVR entered into a Consent Decree Agreement (CDA) in 2013, with some procedural amendments added in 2014 (Exhibit 14). The focus of the CDA is to better define and structure the Rule 1001 implementation and enforcement process and provide for a comprehensive dispute resolution process in cases where the two parties are unable reach agreement on an issue related to Rule implementation. In that instance, the CDA allows either party to request a review and recommendation on

the disputed issue by a "Special Master", an independent expert in the subject field and mutually agreed to by APCD and OHMVR.

The Special Master (SM) selection process involved interviewing a number of candidates chosen for their specific knowledge and expertise in particulate aerosols measurement and evaluation; the origin and control of dust emissions from anthropogenic and natural sources; knowledge of sand dune structure and geomorphology; knowledge of the mechanisms of sand transport, saltation and surface erosion; and a host of other highly specialized scientific expertise and knowledge relative to the ODSVRA dust issue. Dr. William Nickling of the University of Gelph in Ontario Canada was selected as the SM in January 2015 through a consensus decision process based on his well-regarded expertise in these scientific subject areas.

The first use of the Special Master for dispute resolution occurred just recently when OHVMR requested his review and recommendations on the Notice of Violation (NOV 2963) issued for their unauthorized removal of the Oso Control Site monitor and failure to implement the ODSVRA dust controls required for the 2017 wind season (discussed below). OHMVR also sought to have the SM provide a recommendation on resolution of the Nuisance violation, which was cited in the same NOV under APCD Rule 402 and H&SC Section 41700; Rule 402 merely embodies the exact language of H&SC Section 41700 and contains no additional local requirements.

As related to the dispute resolution process for this NOV, APCD Rule 402 and H&SC Section 41700 address Nuisance issues in the context of air pollution control law in California, which prescribes an APCD Hearing Board process to address the abatement of nuisance issues caused by air pollution. This process is completely outside the purview of the Special Master's dispute mediation role, as it involves enforcement of State Law, not local regulations.

Ability of Consent Decree Process to Achieve Effective Dust Controls and Pollution Reduction to Date
OHMVR has operated the ODSVRA in violation of Rule 1001 since 2012, including failure to meet almost every compliance schedule specified in the Rule, and failure to meet the performance standard on many more days than those cited in the NOV. This has resulted in causing an ongoing nuisance and endangering public health through failure to adequately control the particulate emissions from their facility. Even so, this is the first NOV issued to OHMVR since implementation of the initial Consent Decree Agreement executed in 2013. The Air Pollution Control Officer has used his enforcement discretion under the H&SC to not enforce these Rule violations in a good faith effort to follow the collaborative process envisioned by the CD in working with CARB and OHMVR to jointly resolve this issue.

Unfortunately, OHMVR has not followed the collaborative process in the same manner. They have used our withholding of enforcement actions to facilitate numerous delays in implementing meaningful dust mitigation and continue to resist any attempt to place permanent dust controls, such as vegetation, within the most emissive riding and camping areas. They chose to use the CDA dispute resolution process to delay action on the Nuisance NOV by invoking the Special Master review, yet have repeatedly operated completely outside the CDA process in many notable instances:

- The CDA outlines a joint decision-making process between APCD and OHMVR on all important matters, facilitated by policy and scientific assistance and resources provided by ARB. Nonetheless, OHMVR proceeded to remove the Oso control site monitor required under Rule 1001 with no notice to APCD or ARB until after the site had been completely dismantled. The unauthorized removal of the site occurred through a unilateral decision by OHMVR that was only reported to APCD and ARB after the fact. Despite this, in the spirit of collaboration the APCO offered Mat Fuzie, as the newly appointed OHVMR Deputy Director, the opportunity to correct the problem without issuance of an

NOV if the monitor was replaced within 30 days; the APCO subsequently agreed to a one-month extension of the replacement deadline. Neither replacement deadline was met by OHMVR.

- The CDA describes an iterative process of mitigation actions, evaluation and revision to ensure continual progress in reducing emissions and ultimately achieving compliance with Rule 1001. This has not happened as envisioned.
    - In 2014, OHMVR proposed the installation of 30 acres of sand fencing in the northern Le Grande tract area; they wound up installing only 15 acres of fencing for a period of about 3 months during the spring, which achieved no demonstrable reduction in downwind PM10.
    - In 2015, OHMVR proposed and installed 40 acres of temporary sand fencing at the far eastern edge of the Le Grande tract, and 30 acres of hay bales in the very low emissivity non-riding areas in front of the CDF monitor. APCD had recommended the sand fencing be installed in the more emissive areas closer to shore to help reduce the concentration and size of the dust plume that forms in the near-shore disturbed areas where most of the camping and riding occurs; OHMVR would not agree. No demonstrable reductions in downwind PM10 levels were measured during the period the fencing was in place.
    - In 2016, OHMVR proposed and installed, over APCD objection, the same 40-acre temporary fencing project, with an additional 2 adjacent acres of surface roughness components, and resetting of the hay bales in the low-emission nonriding; again, no demonstrable downwind PM10 reductions were measured.
    - In 2016, OHMVR also developed and published a draft 5-year dust mitigation plan and associated EIR (discussed below), that proposed installing the same 40 acres of seasonal wind fencing in the exact same location for each of the next 5 years. In addition, they proposed planting up to 20 acres of new vegetation, with the majority of the planting to occur in the low-emission nonriding areas. No scientific or technical analysis of the potential dust reduction effectiveness of this mitigation plan was prepared to demonstrate its potential to meet the requirements of Rule 1001.
    - In 2017, OHMVR proposed the identical 40-acre wind fencing project in the same location they implemented in 2016. APCD refused to agree and insisted on a greater level of mitigation, including moving the fencing location within the more emissive zones closer to shore. OHMVR then agreed to increase the mitigation acreage to 50 acres, with 30 acres of fencing located closer to shore and the other 20 acres in the same location as the previous 2 years. They began installing the 20 acres in the previous location, then refused to implement the remaining 30-acre fencing project due to a dispute with Coastal Commission staff over the language of their approval letter (Exhibit 11). I informed OHMVR that APCD would have to issue an NOV if they refused to complete the mitigation installation. OHMVR stated they understood this but had to do what they felt they needed to do.
- In preparing their 5-Year Dust Mitigation Plan and associated EIR, OHMVR sought no input from APCD nor the standing ARB/APCD/OHMVR Technical Committee that has reviewed every other mitigation, monitoring and special study proposal put forth during this period. The OHMVR plan included arbitrarily excluding any potential mitigation in the most emissive camping and riding areas in the northern Le Grande tract area, and all riding and camping areas within 1500 feet of shoreline. Further, most of the new vegetation proposed for planting was to occur in the low-emission zones outside the riding areas. When APCD strongly objected to OHMVR bypassing the CDA review process, they agreed to allow APCD to prepare our own mitigation alternative for analysis in the EIR. As a result, APCD recommended the re-establishment of vegetated foredunes in the Le Grande tract and the use of supplemental wind fencing on sequentially increasing acreage until compliance with Rule 1001 was met.

The EIR, which was also solely and independently prepared by OHMVR, determined the APCD recommendation would result in too many "*significant impacts*", primarily because it would reduce the amount of OHV recreation area available to riders, and "*the emphasis on planting vegetation in near-shore areas would likely modify, to some degree, USFWS-designated critical habitat for the western snowy plover*." The area being referred to as critical snowy plover habitat is the most intensive camping and riding area in the ODSVRA and has no current restrictions on its use related to snowy plover protection. There was no mention of how the intensive OHV activity in this area currently impacts the snowy plover "critical habitat", or how those potential impacts might compare to the "significant impacts" determined by OHMVR for planting vegetation and re-establishing the foredunes in this area.

OHMVR continues to resist all proposals to date for implementing effective dust controls that could impact the camping and riding within the highly emissive near-shore areas where the dust plume begins to form. That resistance comes in many forms, including citing the potential threat of lawsuits against them if they implement such controls; providing only partial information on key technical issues related to mitigation decisions until pressed for additional information; taking unilateral actions that disrupt and hinder the collaborative process, such as those described above and many others not mentioned; and conducting ongoing ex-parte communications with APCD Board members that have sown dissention within the APCD Board and significantly affected the ability of the APCO to effectively carry out his responsibilities related to this issue. All these actions and lack of action by OHMVR over the past five years to avoid effectively addressing this significant pollution problem have further endangered public health by preventing the implementation of adequate controls that should have been in place long before now to reduce the particulate emissions from their facility.

Thus, the Consent Decree process for implementing Rule 1001 has, unfortunately, failed to yield any meaningful reductions in the dust emissions resulting from vehicle activity within the ODSVRA. ***As of this date, there no dust controls installed in any of the riding areas within the ODSVRA.*** No permanent dust controls, or even controls that remain in place for more than 6 months, have ever been installed within any of the riding areas, despite the fact we measure violations of the state health standard throughout the year in the downwind areas impacted by the dunes dust.

Effectiveness of Dust Control Efforts Initiated by OHMVR

Filter Day Analysis

The ability to evaluate the effectiveness of dust controls installed each year at the ODSVRA is critical to ensuring the measures implemented in each successive year will provide ongoing progress in achieving increasingly greater emissions reductions until compliance with Rule 1001 is achieved and the Nuisance is abated. Thus, APCD tasked its air quality consultant, Mel Zeldin, with developing an objective and scientific method for evaluating the effectiveness of the ODSVRA dust controls on an annual basis. This is a difficult task, because pollution levels measured at air monitoring sites are a function of both emissions and meteorology, both of which can vary significantly. Thus, it is often difficult to discern whether changes observed in PM10 concentrations from year to year are the result of a change in meteorological conditions or in emissions conditions, or both. Mr. Zeldin has developed and published *A Methodology to Determine Annual Effectiveness of Emission Mitigation Techniques in the ODSVRA* (Exhibit 15). That method, known as the "Filter Day Analysis", holds the meteorological conditions conducive to elevated PM10 as fixed as possible, such that changes in observed PM10 can be more directly attributed to emissions changes. The methodology included very narrow bands of wind speed and direction at both the CDF monitoring site and a wind tower within the ODSVRA. Any day meeting those criteria were termed "filter days."

At the ODSVRA, emissions mitigation techniques, including 40 acres of wind fencing and use of hay bales, have been seasonally implemented since 2015. Prior to that, sufficient measurement data were taken to establish a pre-mitigation "baseline" period from 2011 through 2014. There are four years of baseline data, and now three years (2015 through June 2017) of data for what is called the "mitigation" period. We can then compare the PM10 measurements at CDF for the hours in each year meeting the filter day criteria, and average over each of the years. There is always some year-to-year meteorological variability that cannot be accounted for, and so the number of filter days varies from one year to the next. Regardless, the annual averages of PM10 and wind conditions represent the closest approximations to fixed meteorology.

The results show that the annual average of filter day PM10, when normalized to the annual variation in wind speeds, are not significantly different between the baseline and mitigation periods. The normalized value of PM10 per meter per second of wind speed is 28.6 for the baseline period, and 28.1 for the mitigation period. It is calculated that the normalized value would have to decrease to 23.2 in order to conclude that the mitigations had a statistically significant effect on CDF PM10.

Another analysis, looking at the highest hourly PM10 concentrations (over 400 micrograms per cubic meter) showed the annual average frequency of such occurrences to be 23.9% of all filter day hours during the baseline period, and 24.2% of all filter day hours during the mitigation period. These results do not indicate that the current mitigations have had a detectable effect on reducing PM10 at CDF. What these data do suggest is that there is a complex emissions system within the ODSVRA, and that mitigation solutions need to address substantial areas with the greatest emissivity. This is exactly what OHMVR has resisted doing for the past 5 years that has resulted in the unabated risk to public health and ongoing nuisance conditions for downwind residents, and ultimately the issuance of the NOV.

Difference in Concentrations Between the CDF Riding Area Monitor and the Oso Control Site Monitor

Another method for measuring the effectiveness of the dust controls designed and implemented by OHMVR is to determine if there are noticeable changes in the concentration difference between PM10 levels measured at CDF compared to those measured at the Oso control site during the period when the dust controls are in place. Unfortunately, OHMVR has recently chosen to challenge the validity of the Oso site as a representative location for the control site monitor required under Rule 1001 for performing that comparison. OHMVR is now asserting the Oso site is not appropriate for use as the control site monitor and therefore cannot be used for the comparison required to determine compliance with the performance standard in Rule 1001 C.3.

APCD strongly disagrees with this assertion. As described in the analysis performed by Mr. Karl Tupper, APCD, on the Representativeness of the Oso Control Site Monitor (Exhibit 18), the concentration differences between the PM10 levels measured at CDF compared to Oso are quite consistent with all prior studies performed by both OHMVR and APCD where soil emissivity and ambient PM10 levels were measured and compared in both the riding areas and nonriding areas of the ODSVRA. In addition, the differences between CDF and Oso regarding size of upwind sand fields compared to vegetated areas is not nearly as large nor relevant as OHMVR suggests they are. These comparisons to evaluate representativeness of the sites are much easier to show graphically and will be presented and discussed at the hearing by Mr. Tupper.

Issuance of Notice of Violation and Mutual Settlement Offer

NOV 2963 (Exhibit 21) cites 2 violations of Rule 1001 and a separate violation of Rule 402 and H&SC 41700:

1. Unauthorized removal of the Oso Control Site Monitor required under Rule 1001 Section C.2.a
2. Failure to meet the PM_{10} performance standard required under Rule 1001 Section C.3

3. Nuisance, as defined in H&SC Section 41700 and reiterated in District Rule 402, caused by particulate emissions emanating from the ODSVRA

The discussion above regarding the ability of the CDA process to result in meaningful emissions reductions at the ODSVRA provides the context under which NOV 2963 was issued to OHMVR. Only the Nuisance citation in #3 above is subject to the authority of this Hearing Board for consideration and action. The unauthorized removal of the Oso monitor and failure to meet the Rule 1001 Section C.3 performance standard are subject to the regular enforcement authority of the APCO and are being handled through that process. This typically involves our Mutual Settlement program, which is designed to reach agreement on appropriate resolution of the violation without going to court. If that process fails, then the case may be brought to Superior Court for judgement. The Rule 1001 violations are discussed here only in the context of describing the process and timing of the noticing, issuance and proposed settlement of the NOV prior to the APCO submittal to the Hearing Board of the Petition for an Abatement Order that is the subject of this proceeding.

OHMVR has requested two continuances for this hearing, citing, among other things, insufficient time to prepare its case. The following lays out the timeline of discussions and actions by APCD and OHMVR on this issue:

- Apr 14, 2017: Following several discussions with OHMVR Deputy Director Fuzie regarding ongoing delays in implementing the required dust controls for 2017, the APCO sent an email to Mr. Fuzie (Exhibit 19) identifying the likelihood an NOV would be issued.
- May 5, 2017: Following unauthorized removal of the Oso Control site and the failure to implement the 2017 dust controls, the APCO issued a letter to OHMVR (Exhibit 20) identifying his intent to issue an NOV and asking Mr. Fuzie to contact him within 30 days if he wanted to initiate discussions on resolving the violation prior to issuance. No response was received from OHMVR.
- June 12, 2017: APCD issues NOV 2963 to OHMVR (Exhibit 21), as described above.
- July 6, 2017: APCD issues Mutual Settlement Proposal (Exhibit 22) to OHMVR, which includes a proposal to resolve the Nuisance by fencing off and prohibiting riding on 100 acres in the most emissive zones of the Le Grande tract riding area.
- July 25, 2017: APCD issues response (Exhibit 23) to July 21, 2017 letter from OHMVR (State Parks Exhibit 18). The APCD letter identifies the need to address the Nuisance violation immediately to avoid APCD enforcement separate from the Rule 1001 violations. The APCO had told Mr. Fuzie and the APCD Board of Directors in prior discussions that this separate action could involve bringing the matter before the APCD Hearing Board.
- September 7, 2017: Meeting in San Luis Obispo with APCD, OHMVR, ARB and the Special Master to discuss resolution of the Rule 1001 violations under the CDA process. During these meetings, the APCO discussed the likelihood of bringing the Nuisance violation before the APCD Hearing Board if immediate resolution was not reached.
- September 28, 2017: APCO Issuance of the Petition for an Order of Abatement and scheduling an October 16 meeting of the Hearing Board to consider the Petition.
- October 16, 2017: Continuance of hearing granted as requested by OHMVR, with new date TBD.
- October 27, 2017: Notice that Hearing date was continued to November 13, 2017.

As demonstrated above, OHMVR was given substantial time in advance of the APCO issuance of the Petition to both work with the District to resolve the Nuisance issue prior to going to Hearing, or to prepare their case to dispute the Violation at the scheduled hearing. The more than 80 documents they submitted as exhibits in the case indicates they have been working on their case to dispute the violation for quite some time.

CONCLUSION

The large number of complaints received by APCD from residents downwind of the ODSVRA, and the ongoing exceedances of state health standards measured in the neighborhoods where they live, clearly constitute a nuisance and substantial health risk that must be abated. The PM10 emissions that form the basis of the nuisance have been well documented as emanating from the ODSVRA. The only argument OHMVR can make in their defense is that these emissions are natural, that OHV activity has not made the problem any worse, and/or there's nothing they can do to control it. None of those arguments are valid, as documented in this report.

It is important to note that in the lengthy process of evaluating the issue and presenting proposed solutions to the APCD Board that ultimately led to adoption of Rule 1001, the District had to prove to the satisfaction of the Board that OHV activity on the dunes does indeed significantly contribute to the ODSVRA emissions that are the root of this problem. This was then challenged and upheld in court on two separate occasions, with the court upholding both the viability and need for the Rule to protect public health, and the science upon which the rule was based. Similarly, the Special Master's opinion, while recommending the NOV be set aside for the sake of fostering a better working relationship between APCD and OHMVR, never questioned the science referenced in this report that demonstrates the significant contribution of OHV activity to the dust emissions responsible for creating the nuisance.

Based on all the evidence presented, the APCD requests the Hearing Board to find that the ODSVRA facility operated by OHMVR is causing a public nuisance and to issue an Abatement Order to provide relief for affected residents.

PROPOSED ABATEMENT ORDER

Given the information presented in this report, it is apparent the enforcement authority of this Hearing Board is necessary to provide timely relief for the nuisance and public health risks affecting residents living downwind of the ODSVRA facility operated by State Parks. Permanent dust controls, such as reestablishing vegetated foredunes and increasing vegetated acreage in the inland dunes area, are vital to the ultimate resolution of this pollution problem. However, the timeframes required for those measures to provide effective emission reductions are on the order of a few years, which is too long to provide the timely relief needed now by affected residents. Thus, APCD is proposing the use of perimeter fencing to prohibit riding within the most emissive zones in the Le Grande tract, which is the most significant source of emissions contributing to the nuisance.

State Parks studies have shown that seasonal fencing installed on the snowy plover exclosure during the nesting season from March to September each year has resulted in dramatic reductions in emissions from that area, even though it is open to riding during the rest of the year. Emissivity measurements performed by DRI and reported in their *2013 Intensive Wind Erodibility Measurements at and Near the Oceano Dunes State Vehicular Recreation Area: Preliminary Report of Findings, July 2014* (Exhibit 5), demonstrate that emissions from the snowy plover exclosure during the period when the fencing is up are comparable to those measured in the other nonriding areas, as shown below in Figure 5 from that report. As shown in that figure, the blue and green dots represent the highest soil emissivity measurements, and the brown and tan dots represent the lowest soil emissivity measurements. Soil emissivity is directly related to the potential to generate dust emissions. As can be seen in the figure, soil emissivity within the fenced snowy plover exclosure is very similar to that measured in Nature Preserve and Oso nonriding areas.

Based on this, staff is recommending the Hearing Board issue an Abatement Order requiring the use of perimeter fencing to prohibit riding within the most emissive zones of the Le Grande tract. Staff believes this action will result in timely relief for downwind residents currently impacted by the emissions from this facility.

The specific options for Abatement are presented in the proposed Order of Abatement (attached).

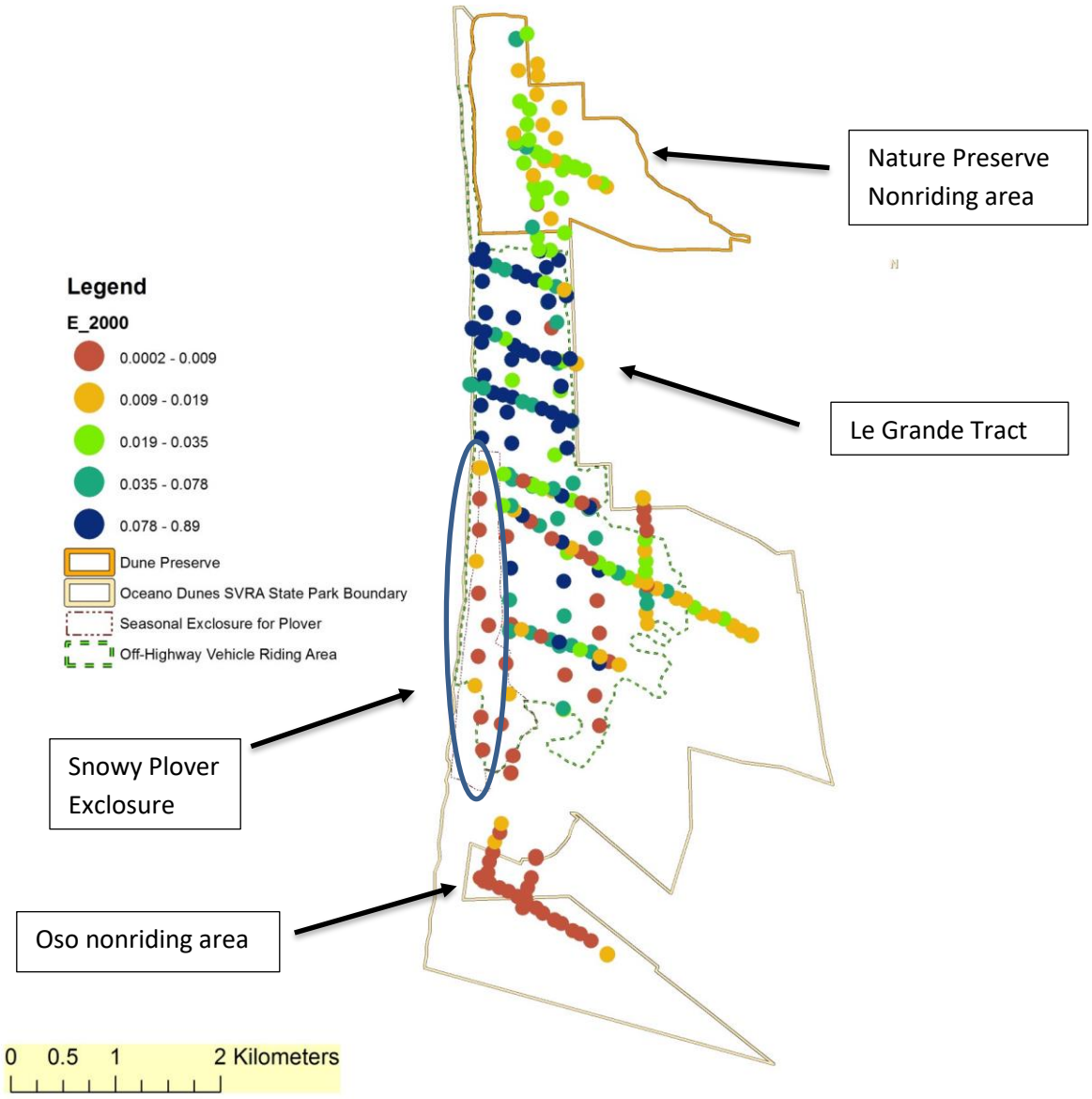


Figure 5. PI-SWERL-measured emissions at 2000 RPM (23 mph) in units of mg of PM10 /m2 sec. Categories are chosen so that each category contains 20% of all data.