

TESTIMONY OF DR. BARRY R. WALLERSTEIN, EXECUTIVE OFFICER, SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT, BEFORE THE LITTLE HOOVER COMMISSION REGARDING THE SALTON SEA

1. The South Coast Air Quality Management District's Interest in Salton Sea Emissions

The SCAQMD is the regional agency primarily responsible for air pollution control in the South Coast Air Basin, which includes all of Orange County and the non-desert portions of the Los Angeles, Riverside, and San Bernardino Counties. The SCAQMD also includes the Riverside County portions of the Mojave Desert Air Basin and the Salton Sea Air Basin including the Coachella Valley. The northern portion of the Salton Sea and its surrounding area within Riverside County is part of the Coachella Valley and is included within the SCAQMD.

Under the federal Clean Air Act, U.S. EPA establishes the health-based ambient air quality standards for specific pollutants but state and local governments are primarily responsible for adopting and enforcing emission limitations to reduce pollution to reach the federal standards. In California, local air districts are responsible for controlling air pollution from all sources except motor vehicles, including windblown dust.

SCAQMD has a significant interest in the future of the Salton Sea for two reasons. First, as less water replenishes the Sea, dry lakebed ("playa") will be exposed, which will increase emissions of particulate matter ("PM₁₀" in the Coachella Valley). Second, reducing water in the Sea will increase salinity and reduce water stability, which is likely to trigger fish die-offs and other impacts resulting in emissions of hydrogen sulfide (H₂S), an odorous and toxic air contaminant which, under certain circumstances, has been shown to be transported at least 150 miles from the Sea as far as the San Fernando Valley to the west.

2. Health Effects of PM₁₀ and H₂S

A. PM₁₀

U.S. EPA established national ambient air quality standards (NAAQS) for PM₁₀ starting in 1987. These particles, less than 10 microns in diameter, threaten health because they can be inhaled deep into the lungs. Numerous studies have shown positive correlations between higher PM₁₀ exposures and serious health effects, including premature death, heart or cardiovascular effects resulting in hospital admissions or emergency room visits, and respiratory effects. People with pre-existing heart or lung disease, those of lower socioeconomic status, children, and the elderly, are especially vulnerable. Some studies have specifically linked mortality and morbidity to relatively high ambient concentrations of particles of "crustal origin," which would be representative of windblown dust from the Salton Sea dry lakebed.

B. H₂S

The California Board of Public Health adopted a state air quality standard for H₂S starting in 1962, and the current standard was adopted by the California Air Resources Board in 1969 at a level of 0.03 parts per million (ppm) averaged over one hour. H₂S is a colorless gas with the disagreeable odor of rotten eggs. People can smell hydrogen sulfide at low concentrations in air, ranging from above 0.0005 ppm. H₂S occurs naturally in crude petroleum, natural gas, volcanic gases, and hot springs. It can also result from anaerobic bacterial breakdown of sulfur-containing organic matter. It is also produced by human and animal wastes. The state ambient standard for H₂S was adopted to reduce odor impacts and protect public health. In addition to odor, exposures may result in physiological symptoms of headache and nausea. At very high levels H₂S may cause shortness of breath, pulmonary edema, and death.

3. PM₁₀ Attainment Status - Coachella Valley and ICAPCD

Both the Imperial County Air Pollution Control District (ICAPCD) and the Coachella Valley have been classified by U.S. EPA as in "serious" nonattainment for PM₁₀. Therefore, levels of PM₁₀ in these areas already threaten the health of their residents. Although the trend of PM₁₀ NAAQS exceedances have decreased significantly in the Coachella Valley since measurements started in 1989, windblown

dust events drive the PM₁₀ concentrations over the NAAQS level several times each year. The number of these wind-related PM₁₀ exceedances was at an all-time low between 2008 and 2011, likely due to a combination of continued effective control strategies, the economic downturn, and relatively favorable meteorology. Starting in 2012, there has been a slight increase in the number of measured high-wind related PM₁₀ standard exceedances. This is likely due to a number of factors, including ongoing drought conditions that result in dry soil dust that is more able to become airborne with strong winds and more frequent southwestern monsoon conditions causing summertime thunderstorm-related wind events.

4. Projected Impacts of the Receding Salton Sea

California has a long experience with the PM₁₀ impacts from the Owens Dry Lake, which has resulted in significant emissions due to the City of Los Angeles diverting water from the Owens Valley. Before controls were implemented, Great Basin APCD estimated that the 110 square mile lake bed emitted over 76,000 tons of PM₁₀ annually. Walls of dust were observed over the lake bed during wind episodes for which PM₁₀ levels were observed at over 20 times the NAAQS level.

http://www.marketplace.org/sites/default/files/field_images/2015/03/dust%20storm.jpg

According to the ICAPCD, even if newly exposed playa at the Salton Sea, which has almost three times the surface area of Owens Lake, produced only 1% of the emissions from the Owens Dry Lake, this would cause levels of pollution around the lake between 300 ug/m³ and 4000 ug/m³, or between double and 25 times the federal health-based standard of 150 ug/m³ established by U.S. EPA. Monsoonal storms in the Salton Sea area have already caused recent windblown dust events, the severity of which would be potentially enhanced with increased exposed playa and dry soil.

<http://www.desertsun.com/story/news/environment/2014/09/06/dust-storm-coachella-valley/15227437/>

A. Quantification Settlement Agreement (QSA)

According to ICAPCD, additional PM₁₀ emissions from the water transfer approved in the QSA would amount to as much as 737 tons per day of PM₁₀, which is triple the amount of existing PM₁₀ pollution in the air basin. As noted, ICAPCD and the Coachella Valley are already classified as in "serious" nonattainment. The receding Sea will likely result in the equivalent of 3,843 major stationary sources of PM₁₀ in Imperial County, which currently has only one major PM₁₀ stationary source. By 2036, a lake bed area as big as Owens Dry Lake is predicted to be exposed (Hazard's Toll: The Costs of Inaction at the Salton Sea, Pacific Institute, September 2014), so impacts to the area in and around the Salton Sea could be substantial.

B. The "Big Burp" and H₂S Impacts

On Sunday September 9, 2012, a strong thunderstorm over the Salton Sea caused odors to be released and transported to the northwest, across the Coachella Valley, through the Banning Pass and into the South Coast Air Basin. The odors also crossed through the mountain passes west of the Salton Sea and into the Temecula Valley. The following day, SCAQMD received over 235 complaints of sulfur and rotten egg type odors, some as far west as the San Fernando Valley, and SCAQMD initiated a significant response effort to identify the source of the orders and assess the Basin-wide impacts. Based on the odors described by complainants, SCAQMD compliance staff visited and conducted surveillance in the vicinity of certain waste handling operations, refineries, and other facilities associated with sulfur-type emissions, all of which were ruled out as sources of the odors reported. Other inspectors were dispatched to identify possible sources in portions of San Bernardino and Riverside Counties where the complaints were most numerous.

Air samples were collected from Redlands, Riverside, Beaumont, Indio, Mecca, Thermal, and two locations immediately downwind of the Salton Sea for analysis by the SCAQMD Laboratory for total sulfur and H₂S. Results of sampling showed a pattern of total H₂S from 149 parts per billion (ppb) near the Salton Sea, to ~30 ppb in Indio and Thermal to <20 ppb in the Beaumont and Riverside areas. The state air quality standard for hydrogen sulfide is 30 ppb, averaged over one hour, and the odor threshold for

hydrogen sulfide is generally about 8 ppb. A Meteorological and modeling analyses confirmed the cause; a high-wind monsoonal front passing through the Salton Sea area the night of September 9 was consistent with the timing and locations of complaints in the Riverside and Coachella Valley areas, and that transport of H₂S at concentrations at or exceeding the odor threshold was possible. The event served as a cautionary reminder that the Salton Sea, given the right conditions, can affect air quality for a majority of the South Coast, Mojave, and Salton Sea Basins.

C. Resource Impacts of Air Quality Incidents

Similar to other governmental agencies during the 2012 H₂S event, SCAQMD fielded numerous calls, but given the call volume, there was a brief time where callers were not able to get to a live person until additional resources could be mobilized. The event occurred during non-business hours for SCAQMD, but more phone operators were brought in to handle the increased number of public calls, and field inspectors and measurements staff were mobilized to respond to most of the areas reported to be affected. SCAQMD communication with Riverside County Fire Department during the event indicated that they also were also experiencing an extensive amount of public inquiries regarding the odors raising concerns that other health/fire related calls might not be able to get through to the fire dispatch.

Mobile monitors and sample collection equipment were deployed, some of which required analysis before determination of estimated exposure levels and identification of the source. The exposure information was available to the public the day after the event. However, it was clear that more timely information would be beneficial for future responses, especially given that the Salton Sea's receding shorelines may create the potential for an increased number of large-scale odor events. Thus, SCAQMD deployed and currently operates two continuous H₂S monitors to measure ambient H₂S concentrations in the northern Salton Sea area which can be used to assess population exposure in near real time during Salton Sea odor events. Since the deployment of the H₂S monitors (December 2013), SCAQMD has issued ten odor advisories to the Salton Sea Basin. Thus SCAQMD has increased its capability for ambient measurements and

response to episodic events, but more frequent events due to a receding shoreline, including dust events, would entail additional resource commitments.

5. Environmental Justice Concerns

The northern portion of the Riverside County portion of Salton Sea that is under SCAQMD's jurisdiction is close by to environmental justice communities in the City of Mecca, a largely Hispanic and lower-income community, and the tribal lands of the Torres-Martinez Reservation. Since levels of pollution are typically the highest near the source of emissions, as was the case H₂S event in 2012, these are the areas within SCAQMD that will be most impacted by air pollution resulting from the receding Salton Sea. The State of California has an obligation to avoid disproportionate adverse impacts on environmental justice communities resulting from the water transfers that benefit urban communities such as San Diego and Los Angeles.

6. Protecting Air Quality in the Salton Sea Area

A. Enforceability

When the Quantification Settlement Agreement Contracts were signed, it was well known that the water transfer would cause a variety of adverse impacts. Accordingly, the State of California "unconditionally" committed to pay all costs of mitigation of these adverse impacts beyond the costs committed by the Imperial Irrigation District and the receiving water agencies. However, the Court of Appeal concluded that if the Legislature failed to appropriate funds to meet this obligation, "the water agencies could be left with an unenforceable judgment for the unpaid excess mitigation costs" *QSA Cases*, 201 Cal. App. 4th 758, 796-797 (2011). Therefore, the most important requirement for any plan to preserve the Sea or mitigate adverse air pollution impacts is that it be legally enforceable. The Imperial Irrigation District has initiated proceedings before the State Water Resources Control Board to make this obligation enforceable by conditioning water transfers after 2017, when IID's obligation to supply replenishment water to the Sea expires, on the State meeting its mitigation obligations.

B. Analysis of Contaminants in the Seabed

There are limited number of studies and measurements that focus on Salton Sea emissions. Additional investigations around the Salton Sea are necessary for establishing baseline conditions, providing information to prioritize the locations and designs for near-term mitigation strategies, providing feedback on the effectiveness of those strategies, and assessing potential exposure to nearby populations. For example, one such study would determine a spatially resolved dataset of measured PM emissions factors for windblown dust under varying wind conditions from exposed Salton Sea playa. There is also a need to understand the chemical composition of the current and future exposed playa dust. As a terminal lake, toxic metals and pesticide residues from natural and man-made sources have potentially accumulated in the lake bed over decades of run-off, making exposure to the emissions even more dangerous.

C. Feasible PM₁₀ Mitigation

Because California is currently experiencing a severe drought, it may not be immediately feasible to fully replenish the Sea. Replenishment appears to be the best solution to prevent impacts to migratory birds, recreation and tourism, and the air pollution episodes which may result from lower water levels. Nevertheless, even if full restoration of the Sea is not feasible, it is imperative that the State act to prevent the looming public health crisis from increased PM₁₀ emissions as the Sea recedes. There are several feasible measures available to reduce PM₁₀ dust impacts that are less water-intensive than fully replenishing the Sea. These measures include shallow flooding, planting low water-use vegetation, and applying a layer of gravel to the exposed playa. (*Schade, et al.*, "Owens Valley PM₁₀ Planning Area Demonstration of Attainment State Implementation Plan," 1998;

http://www.arb.ca.gov/planning/sip/planarea/gbasin/owens/owens_1998sip.pdf).

These measures have been shown effective to reduce average annual PM₁₀ concentrations over time. Other methods have been proposed such as developing renewable energy projects to both assist in mitigation and provide funding for other mitigation projects. Therefore, even in today's drought conditions, there are available and

feasible mitigation measures that can and should be used while a plan for full restoration is being developed at the Salton Sea.

Thank you for the opportunity to provide testimony on this important issue.
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