Salton Sea Windblown Dust Levels and Sources

Earl Withycombe
California Air Resources Board
Relevant Public Concerns

• How much windblown dust is being generated by exposed Salton Sea playa?

• How will dust emissions from Salton Sea playa be controlled to levels that are protective of public health?
Annual Average PM$_{10}$ Trends
Salton Sea Shoreline Stations
2010 - 2018

Salton Sea Shoreline Annual Average PM$_{10}$ (µg/m$^3$)

Significant monitor downtime occurred during 2015 - data not representative of annual conditions.
Number of 24-Hour PM10 Exceedance Days – North Shore
Number of 24-Hour PM10 Exceedance Days – South Shore

Salton Sea PM$_{10}$ Exceedance Days
Central & South Shores (Imperial County)

Days Per Year Above 150 µg/m$^3$

- Salton City
- Naval Test Base
- Bombay Beach
- Sonny Bono
- Niland
- Westmorland
- Brawley
- El Centro
- Calexico
2018 Hourly High Wind Directions

Salton Sea 2018 High Wind Roses
Directions that high winds are blowing from, and wind speeds in meters per second

Legend
- >= 15
- 13 - 16
- 10 - 13
- 7 - 10
- 0 - 7
## Playa and Non-Playa Contributions to 2018 PM$_{10}$ Exceedance Days

Numbers and Percentages of 2018 PM$_{10}$ Federal Exceedance Days Associated with Playa or Non-Playa Area Emissions — Or Both

<table>
<thead>
<tr>
<th>Station</th>
<th>Playa Areas</th>
<th>Non-Playa Areas</th>
<th>Both Area Types</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>North Shore (Riverside County)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Salton Sea Park</td>
<td>0 (0%)</td>
<td>2 (100%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Torres Martinez</td>
<td>0 (0%)</td>
<td>11 (100%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td><strong>Central and South Shores (Imperial County)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bombay Beach</td>
<td>4 (80%)</td>
<td>1 (20%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Naval Test Base</td>
<td>2 (10%)</td>
<td>19 (95%)</td>
<td>1 (5%)</td>
</tr>
<tr>
<td>Salton City</td>
<td>2 (11%)</td>
<td>17 (89%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Sonny Bono</td>
<td>4 (100%)</td>
<td>1 (25%)</td>
<td>1 (25%)</td>
</tr>
</tbody>
</table>
Exposed Playa and Desert Lands
Windblown PM$_{10}$ Emissions
7/1/2017 – 6/30/2018
Windblown Dust Dynamics - General
Sand Sheet Surrounding Salton City Monitor

PM$_{10}$ Monitor

Sand Dunes

May 2012

August 2014
Transgressive Sand Dunes Near Naval Test Base

Source: IID
Playa Dust Control Projects: Surface Roughening

Source: IID

$800/acre
Playa Dust Control Projects: Vegetation Enhancement

Seed Harvesting

Iodine Bush

Seedlings

6 Months

Beach Ridges at Bombay Beach

$9,000/acre

Source: IID
Findings to Date

• Few discernible trends in PM$_{10}$ air quality are evident in the monitoring data
• Only Bombay Beach, Calipatria, and Niland are primarily downwind of exposed playa
• Windblown dust is not impacting these communities as much as others in the Air Basin at this time
Findings to Date (continued)

• Affordable dust control measures are available and being installed on exposed playa near the Alamo and New River deltas

• Migrating sand on the western shore of the Salton Sea is causing the highest PM$_{10}$ readings and will significantly increase playa emissions unless stabilized on the coastal plain