Owens Lake SDS Site Realtime Monitoring Case Study

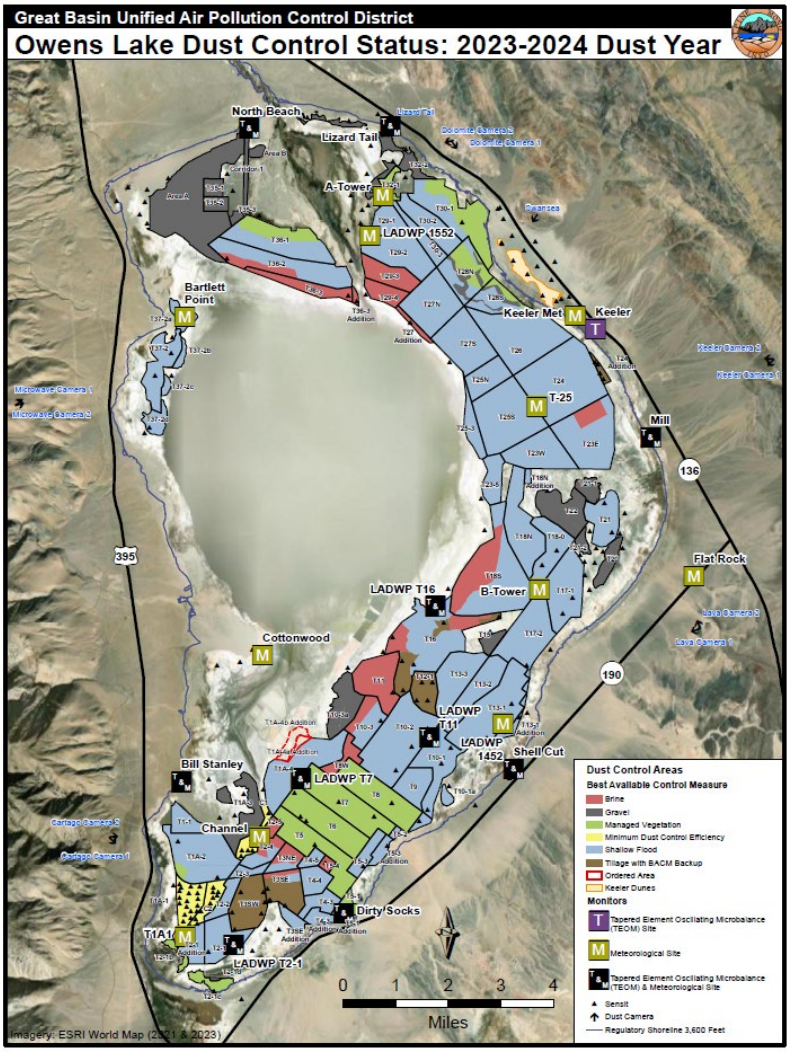
Background

Owens Lake has been a significant source of SDS events since the diversion of water for use in Los Angeles, California dried the lake resulting in large expanses of exposed playa that are emissive under high winds (see **Owens Lake SDS Management Case Study**). Part of the management of dust emissions at Owens Lake by the Great Basin Unified Air Pollution Control District involves an extensive system of instruments and human field work, to (1) Identify sources of dust for management, (2) Assess and ensure the effectiveness of dust control management measures in use, and (3) Trigger changes in management measures when in use measures are not effective. This monitoring system, which may be the most detailed for any SDS source, is described in more detail below.

Instrumentation

The backbone of the Owens Lake monitoring system relies upon the following sand and emissions monitoring components. See the **Annex** for additional technical information on instrumentation used.

1. Nine Air Monitoring and Meteorological stations located around the lake that collect PM10 data using Thermo Scientific Tapered Element Oscillating Microbalances and/or Thermo Scientific Partisols, as well as wind speed and direction data.
2. As of 2024, 203 Sand Monitoring Sites including passive sand catchers that provide sand mass for a known time period and Sensit devices that time-resolve this mass to calculate hourly sand motion.
3. Dust cameras (see https://www.gbuapcd.org/cgi-bin/cameraViewer) for real time and historic imagery.



The map on the right shows the location of the monitoring equipment, as well as the dust mitigation areas, on and surrounding Owens Lake. (The 203 Sand Monitoring Sites are noted as “Sensit” in the may key.)

Data from all the monitoring equipment are transmitted digitally via remote telemetry to the Great Basin Unified Air Pollution Control District offices in Bishop, California for analysis. Near-

real time reports of PM10 and PM2.5 levels are available online together with a summary of Owens Lake conditions on the previous day. Additionally, when elevated levels of PM10 are monitored in communities surrounding Owens Lake, near-real time health advisories are posted to the District's website and sent to public who have subscribed via email and text. Regular analysis is used to assess the effectiveness of dust control measures and to identify possible new or unmanaged sources of dust.

Human Field Work
In addition to the field work associated with running and maintaining the instrumented data collection systems, the Great Basin Unified Air Pollution Control District also uses staff to conduct field work to evaluate the dust control areas of Owens Lake that include areas with shallow flooding ponds or sprinkler areas, vegetation, gravel, brine, and tillage (a surface roughening). The field work is primarily focused on assessing the conditions of each dust control measure as well as evaluating areas that have not been controlled.

For example, when brine is used as a dust control option, areas are flooded with water with high salt content and allowed to evaporate to create a salt brine crust sealing the dry lake surface and preventing dust. However, the nature of these brine-covered areas can change over time leading to a need for in-field observations in addition to the data from monitoring instrumentation. Other dust control areas may change due to weather events or sand inundation from other areas and require field evaluations.

Sources Used in the Case Study
- Field visit with Great Basin Unified Air Pollution Control District staff to Owens Lake.
- https://www.gbuapcd.org/OwensLake/Background/
- https://www.gbuapcd.org/OwensLake/DustControls/
- https://www.gbuapcd.org/OwensLake/DustControlStatus/
- Owens Valley PM10 Planning Area State Implementation Plan https://www.gbuapcd.org/District/AirQualityPlans/OwensValley/
- **Owens Valley PM10 Planning Area,** PDF document authored by Great Basic Unified Air Pollution Control District.

Annex – Instrumentation Technical Details
- **2016 Owens Lake Dust Source Identification Program Protocols (Attachment C to the 2016 District Board Order 160413-01 Requiring the City Of Los Angeles to Undertake Measures to Control PM10 Emissions From The Dried Bed Of Owens Lake.** See https://gbuapcd.org/Docs/District/AirQualityPlans/OwensValley/Board_Order_FINAL_20160425.pdf)
- **EPA Other Test Method – 30: Method to Quantify Particulate Matter Emissions from Windblown Dust.** See https://www.epa.gov/sites/default/files/2020-08/documents/otm30.pdf).
- **Thermo Scientific Tapered Element Oscillating Microbalances**. See (https://www.thermofisher.com/mg/en/home/industrial/environmental/environmental-learning-center/air-quality-analysis-information/teom-technology-particulate-matter-measurement.html-.
- **Thermo Scientific Partisols**. See https://www.thermofisher.com/order/catalog/product/2025I.
- **Sensit** monitors. See https://sensit.com/.

Reference to specific instruments does not indicate recommendation of these equipment.