It Starts with You!

Air Quality Data Collection –
If it's not measured, did it happen?

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Air quality data seems to get pushed through a hole to another universe.

Where does it go?

What is it used for?

Occasionally, something comes back through the hole.

Is anybody out there?

What happens as data is pushed to the higher levels?

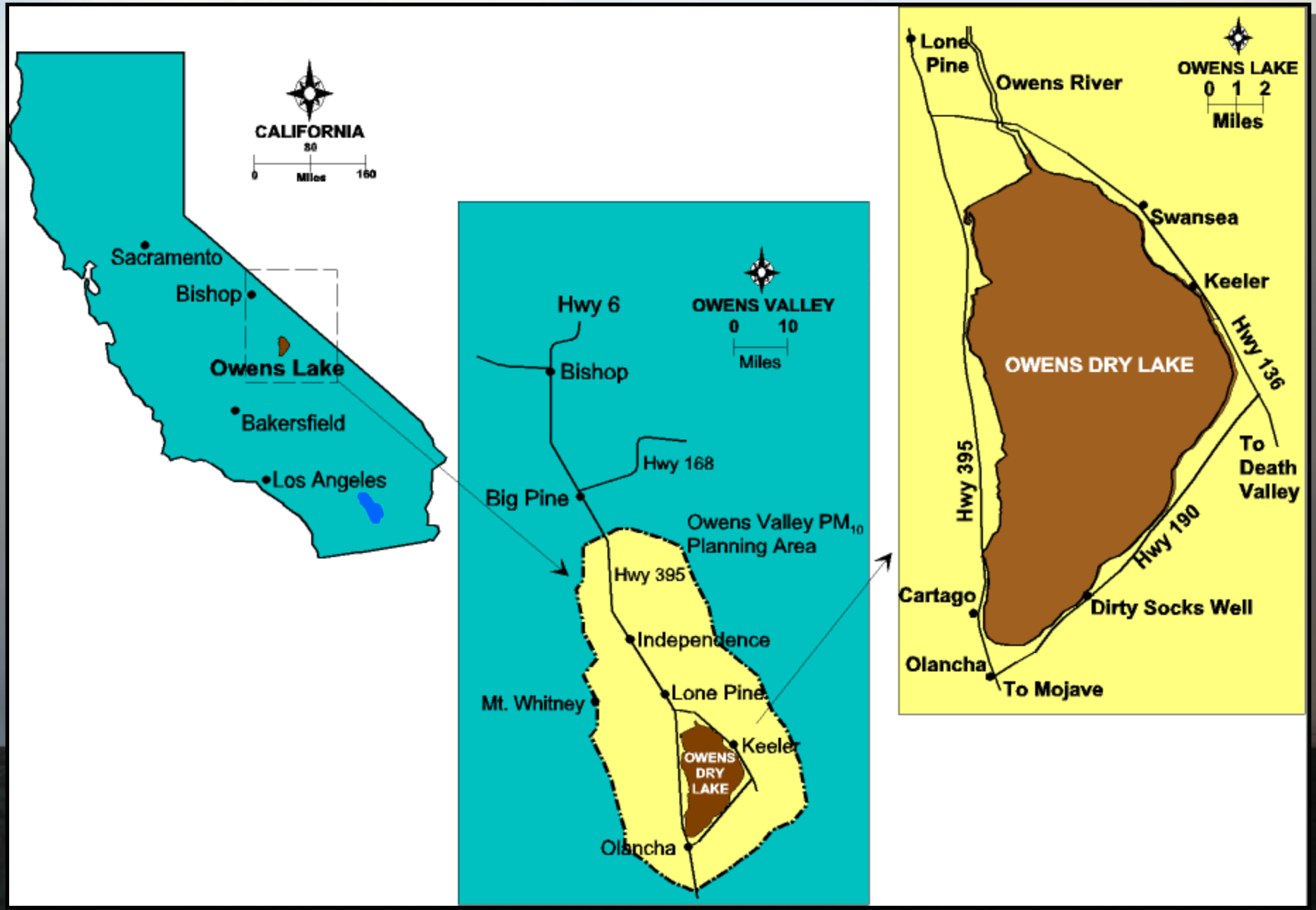
Why are you here?

The data you collect has many, many influences on:

- **Policy**
- **Regulations**
- **Politics**
- **Economics**
- **Law and**
- **Public opinion**

Air monitoring data, properly collected and supported, makes the case.

Owens Lake Vicinity Map



100 years ago, the 110 square mile Owens Lake was one of the largest natural lakes in California.

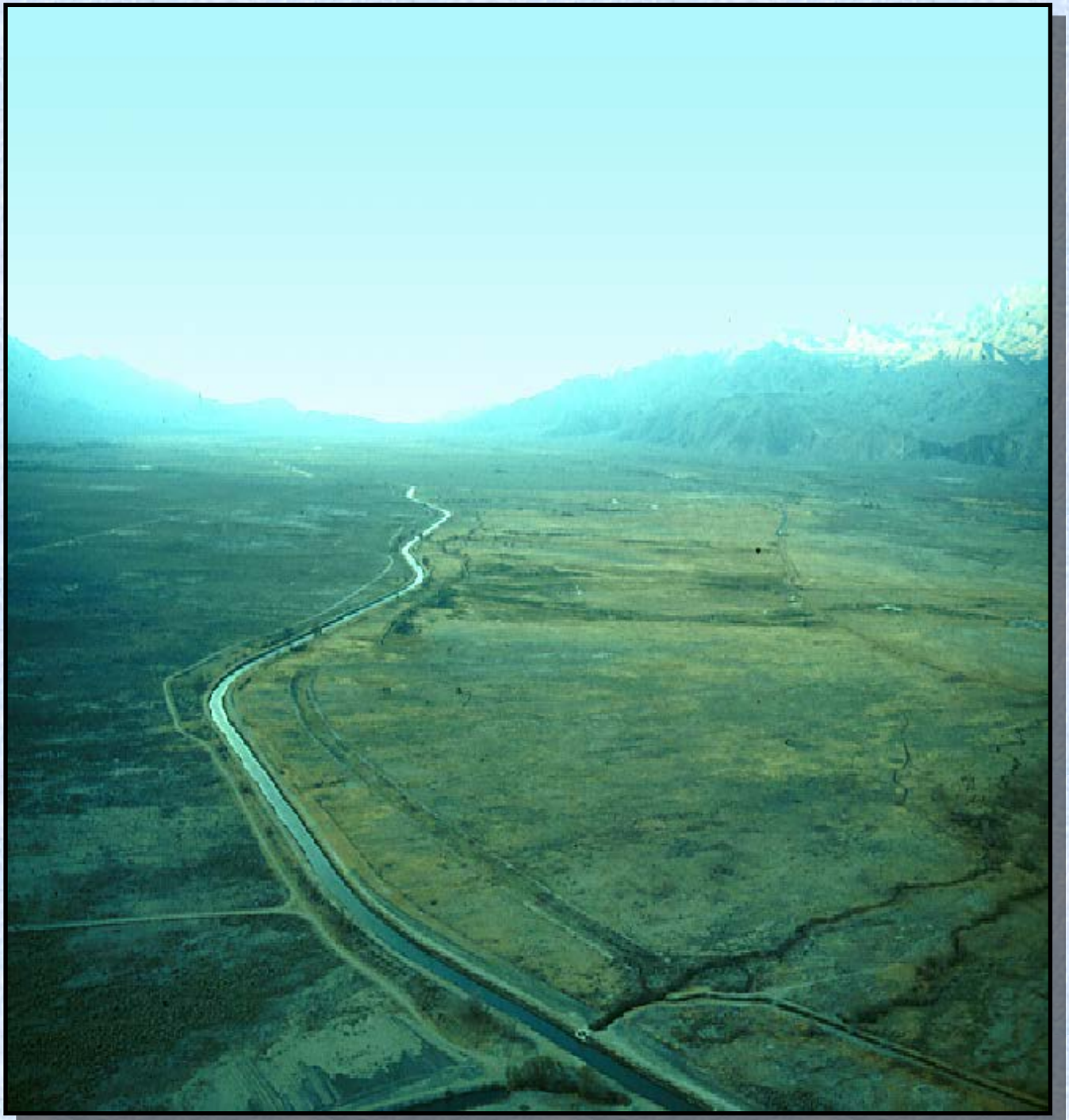
However, it was a saline terminal lake—water flowed in, but only evaporated out.

(Collection of the Henry E. Huntington Library)

Coincidentally, in the early 1900s, the City of Los Angeles was in search of a new water supply for its newly incorporated San Fernando Valley.

Los Angeles began buying land in the Owens Valley for the water rights.

In 1913, the City of Los Angeles Department of Water and Power (DWP) completed construction of the Los Angeles Aqueduct. The Aqueduct diverted Owens River water destined for Owens Lake 223 miles south to Los Angeles.



By the mid-1920s, the lake was essentially dry

As a result of Owens Lake water diversions, the Southern Owens Valley has experienced some of the highest levels of fine dust (PM-10) air pollution ever measured in the United States.

March 30, 2010 – North end of Owens Lake, California

Prior to the start of control in 2000, the Great Basin APCD estimates that the lake bed emitted over 76,000 tons of PM-10 annually (almost 7,000 tons on a peak day.)

Two views of the Owens Valley from the same aerial vantage point – the top photo was taken on a calm day, the bottom photo on a windy day.

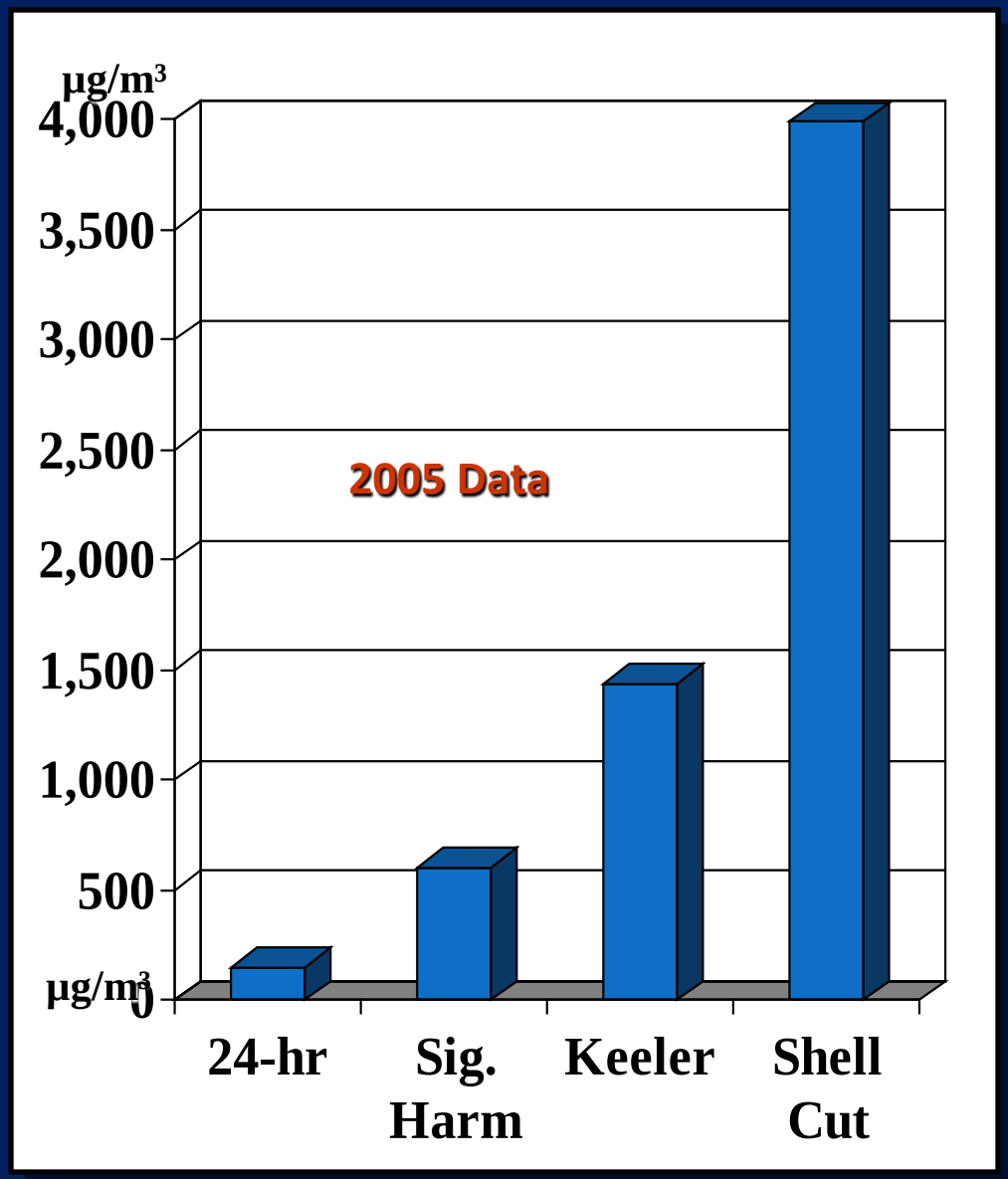
The arrow points to Mount Whitney (Elev. 14,496 feet)

Why is the Dust a Problem?

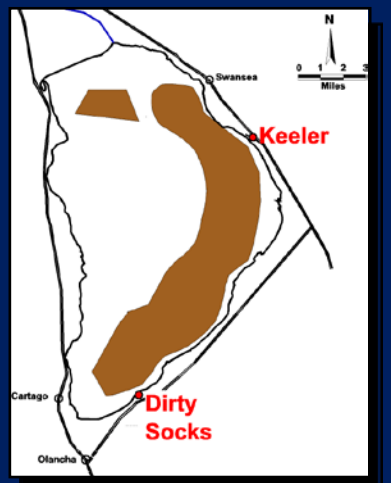
(This is where the air monitoring people come in)

Owens Lake Dust Descending on Inyokern, California (1977)

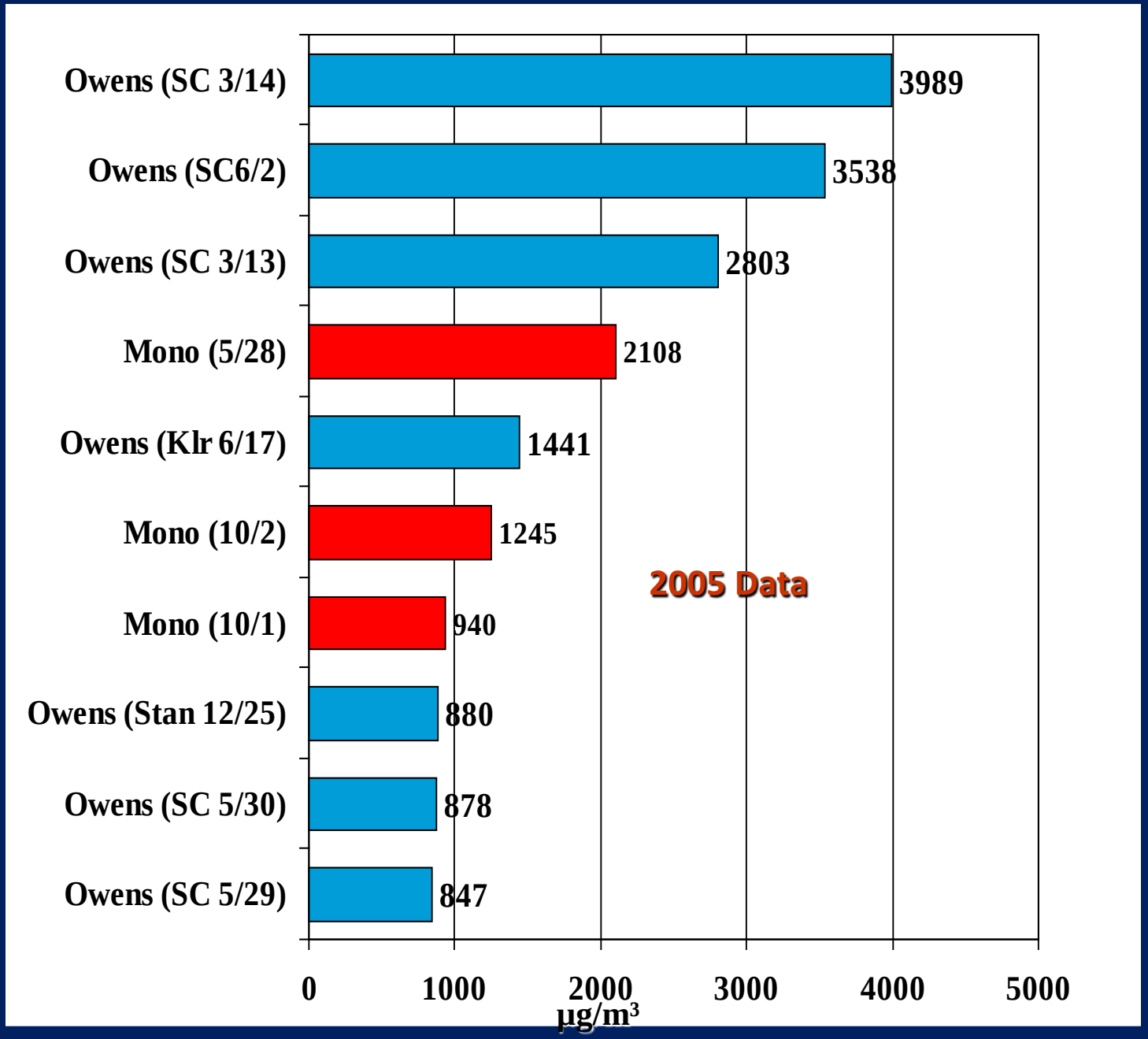
1. Because the PM-10 values are very high



- The Federal 24-hr standard for particulate matter is **150 µg/m³**.
- The State standard is **50 µg/m³**.
- The "significant harm to human health" level is **600 µg/m³**.
- In 2005, 24-hr levels of **1,441 µg/m³** (10 times Std.) were measured in the town of Keeler and **3,989 µg/m³** (26 times Std.) at the Shell Cut monitor.



2. Because severe exceedances are frequent



The US EPA Data for 2005 shows that of the 10 highest PM-10 values reported in the entire U.S., 7 occurred at Owens Lake and 3 occurred at Mono Lake.

Owens Lake's highest value of 3,989 µg/m³ was 5 times higher than the highest non-Great Basin value (#13 – New Mexico @ 760 µg/m³).

How is the dust being controlled?

Approved Dust Control Measures

During the 1990s, Great Basin's research at Owens Lake resulted in 3 approved methods (BACM):

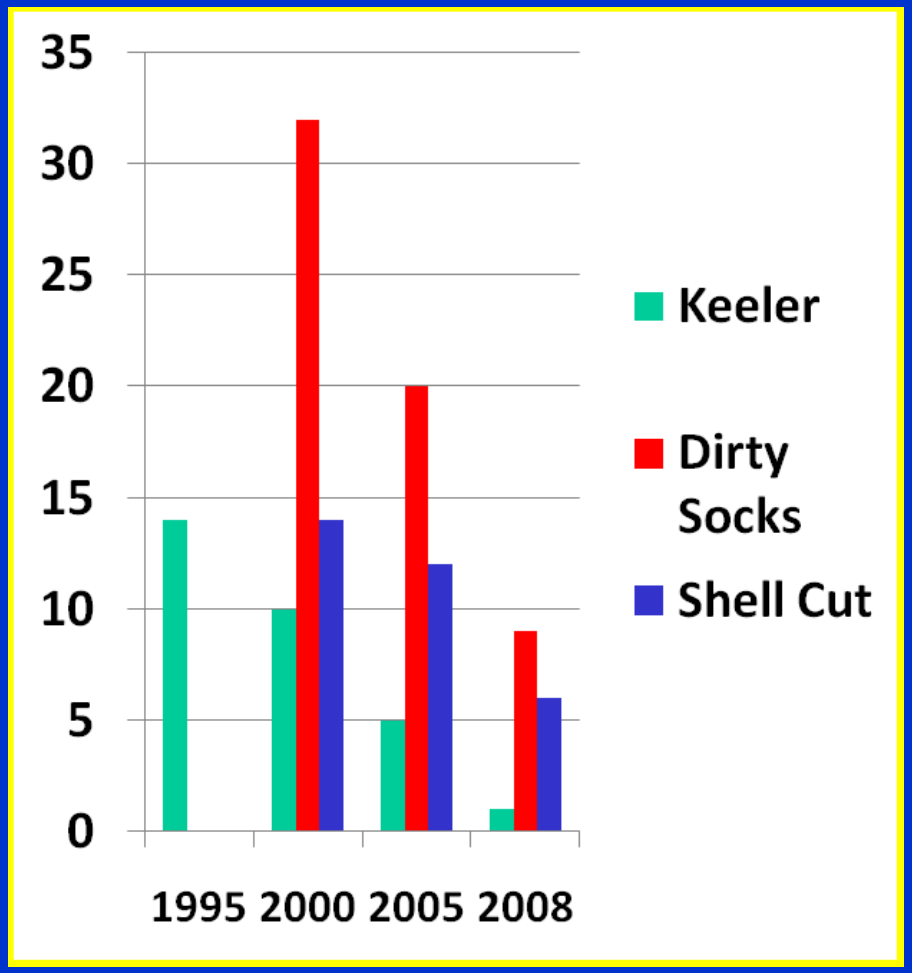
- Native vegetation,
- Flooding with shallow sheets of water and
- Gravel blanket

Eight phases of work has taken place on the lakebed since 2000 and has included:

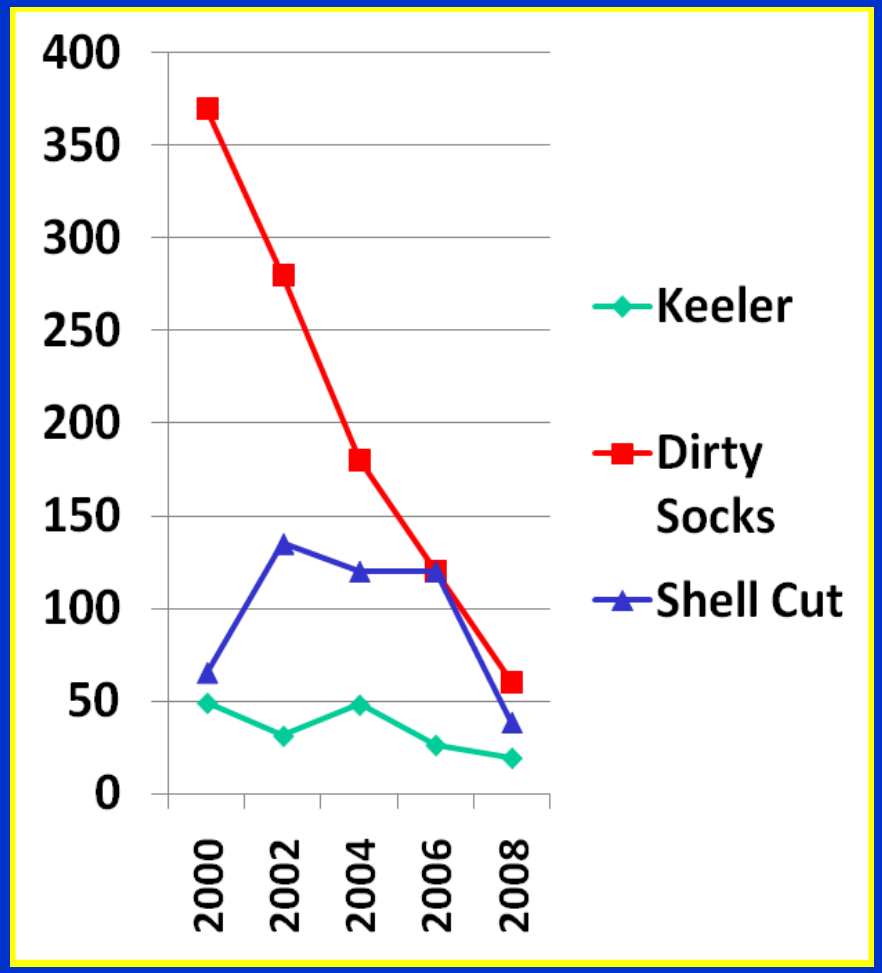
- 500 miles of pipe and drains
- 10 million cu.yds. of grading
- 3,500 miles of drip tube
- 7,300 flood bubblers
- 75,000 ac-ft of water per year

However, there have been significant decreases in both the number of federal PM_{10} exceedances per year, as well as the average annual PM_{10} values.

Number of federal 24-hr PM_{10} exceedances per year (150 µg/m³)

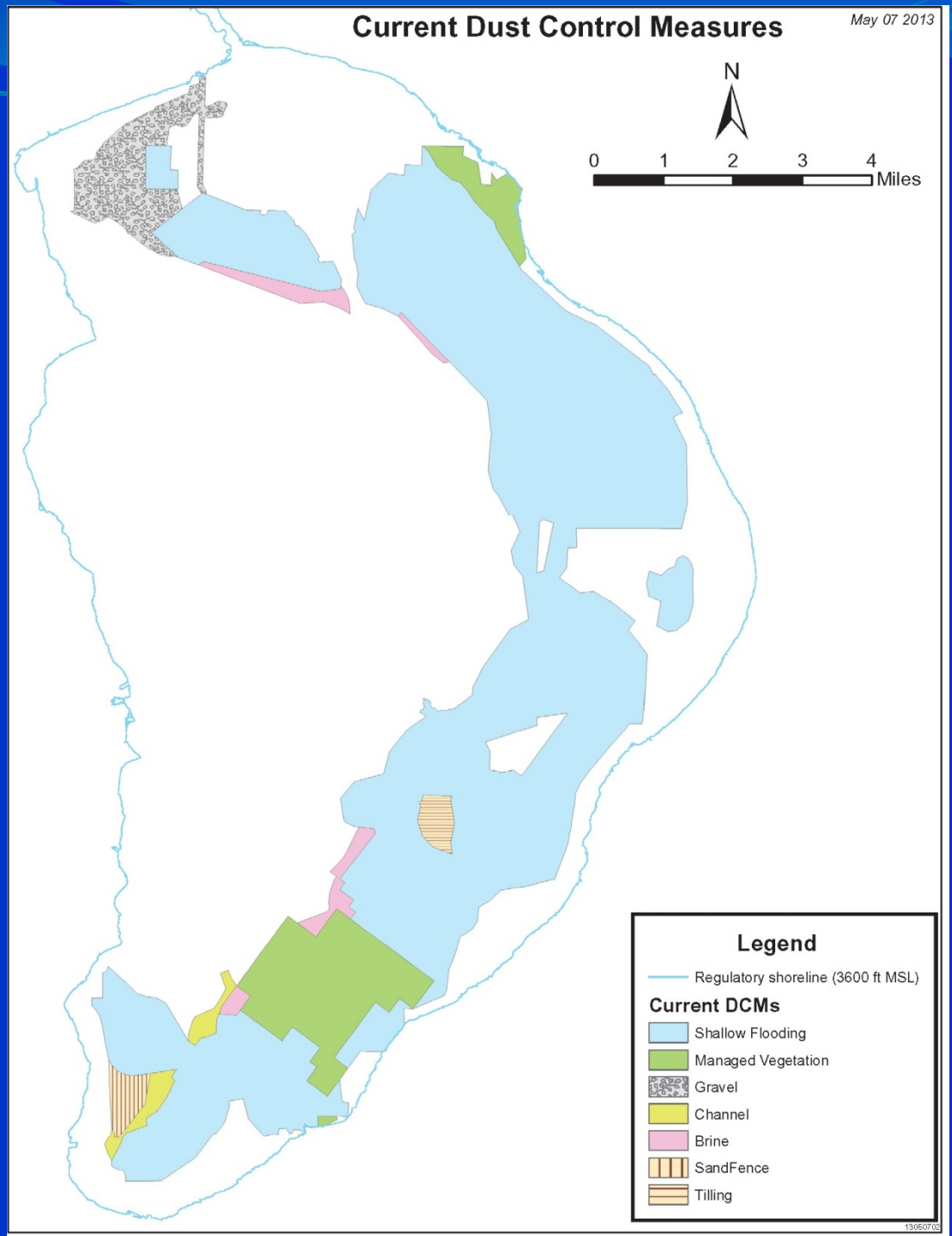


Average annual PM_{10} level (µg/m³)

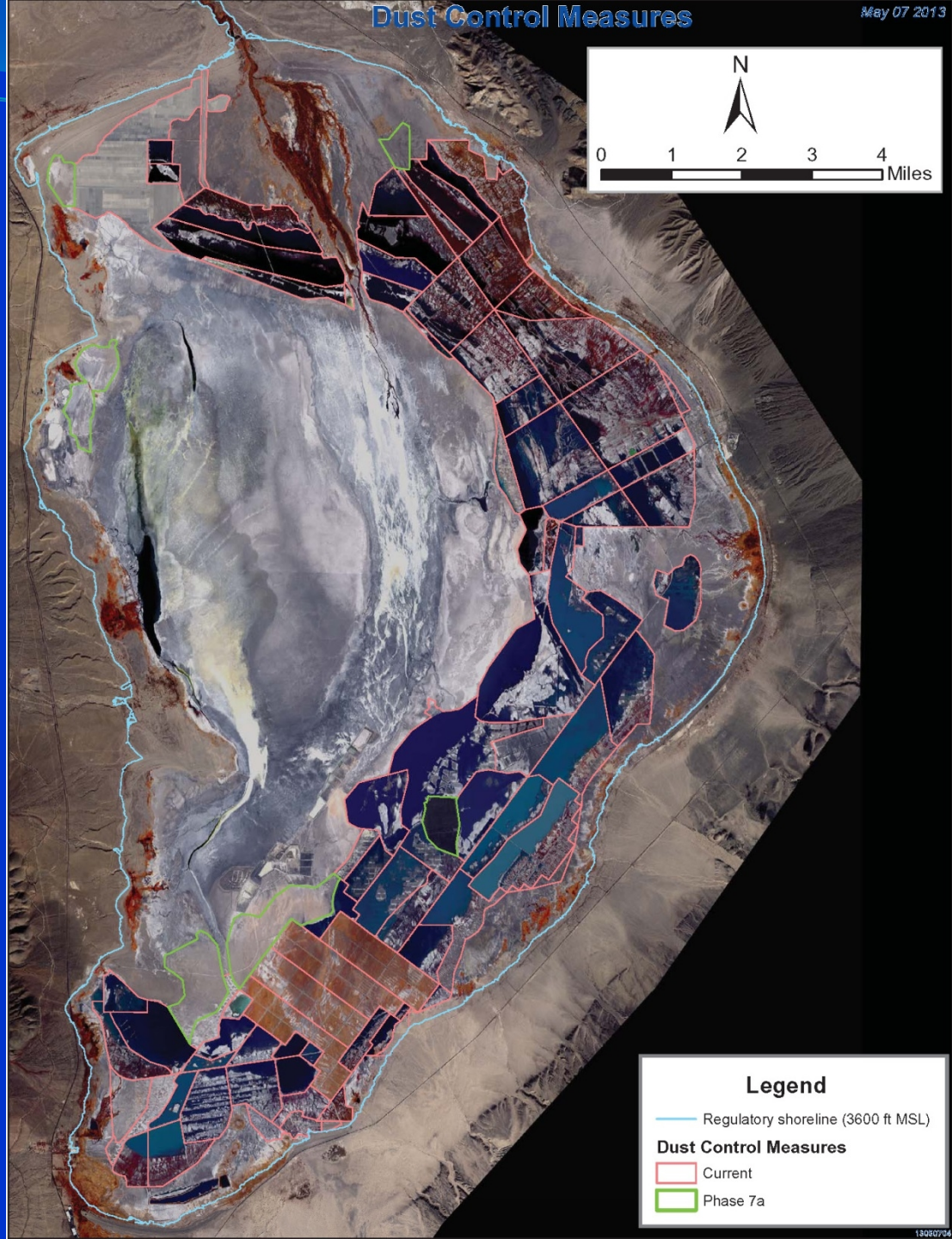


Current (2013) Owens Lake Dust Controls

Shallow Flood	36.5 sq. mi.
Vegetation	3
Gravel	2
Sand Fence	0.5
TOTAL	42 sq. mi.
	(27,000 acres)



Satellite Image of Current Dust Controls



Cost of Owens Lake Air Pollution Control

- The City of Los Angeles claims to have spent **$1.2 Billion** on Owens Lake dust controls since 2000.
- With 42 sq. mi. currently controlled, the cost of controls is about **$29 million** per square mile.
- Annual operation costs are about **$25 million**
- Annual water replacement cost are about **$46 million**

- PM10 controlled = **75,000 tons per year**

- Cost effectiveness (25-yr life) is about **$2,700 per ton**

  This is far less than the cost effectiveness of most PM10 controls. (SCAQMD c/e limit = $5,300/ton)

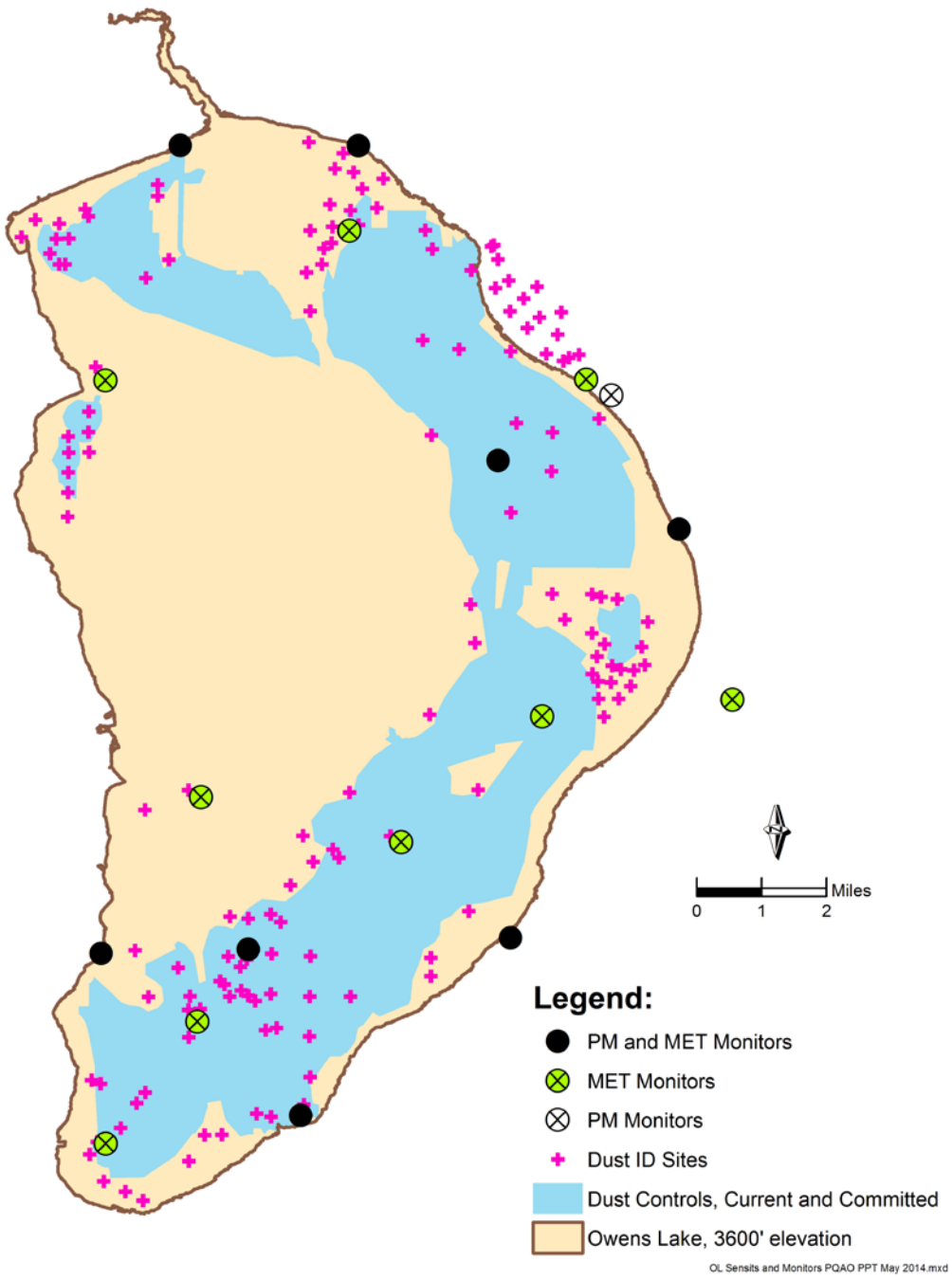
Dust ID Program

None of the air pollution control at Owens Lake would have been possible without superior air quality data.

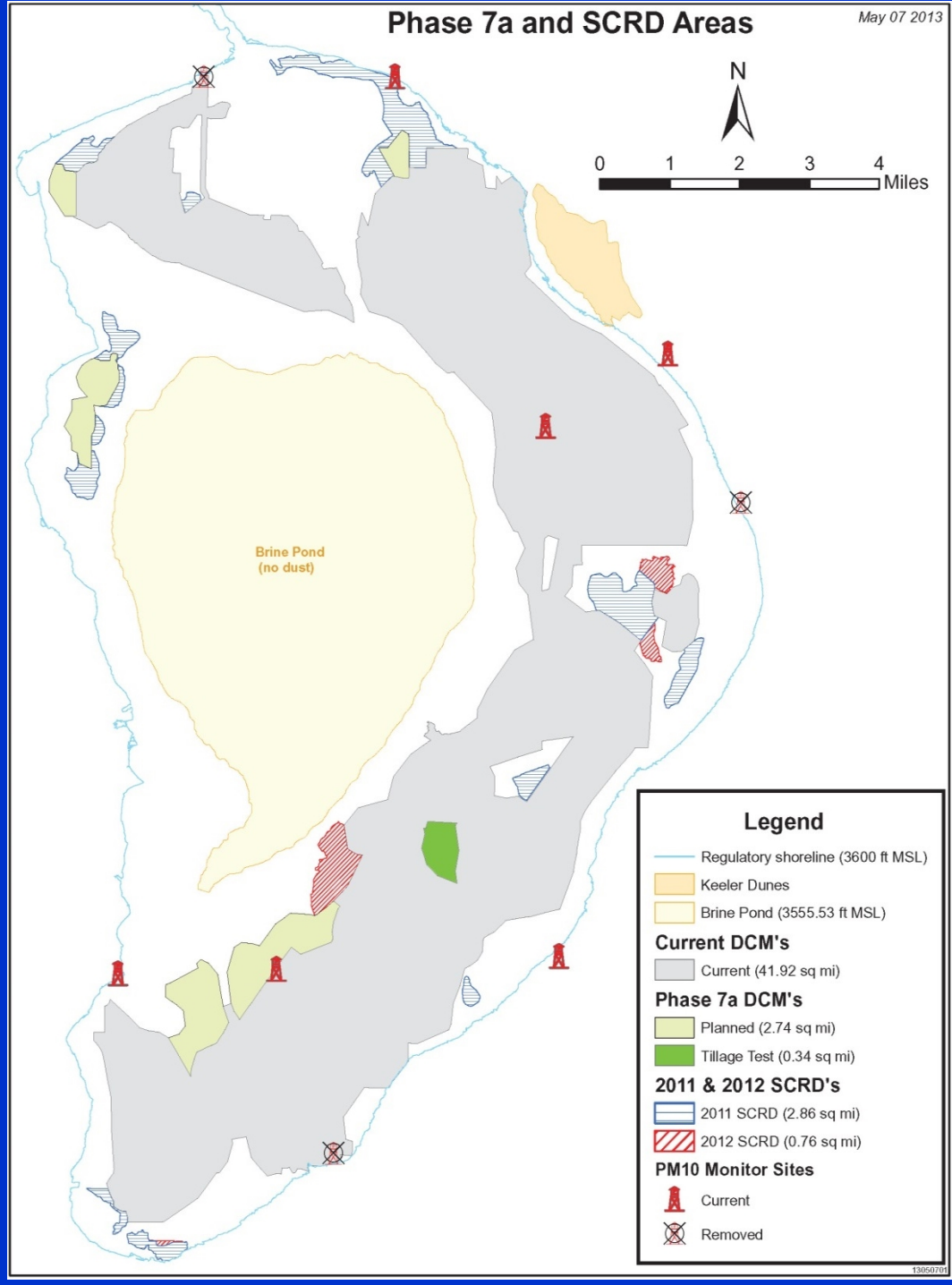
At Owens Lake, the District monitors:

- PM_{10}emissions at 12 continuous monitors (TEOMs)
- Sand motion at more than 200 lakebed locations (Sensits)
- Meteorology at 20 sites
- Time-lapse video at 14 cameras

Every year, Great basin collects over 50 million data points that all go into what is called the "Dust ID model."



The results of the Dust ID modeling allows Great Basin to pinpoint those areas on the emissive lakebed that cause or contribute to PM_{10} exceedances.



Recent modeling indicates additional controls are required in order to attain the Standards

In place

8 phases 42 sq. mi.

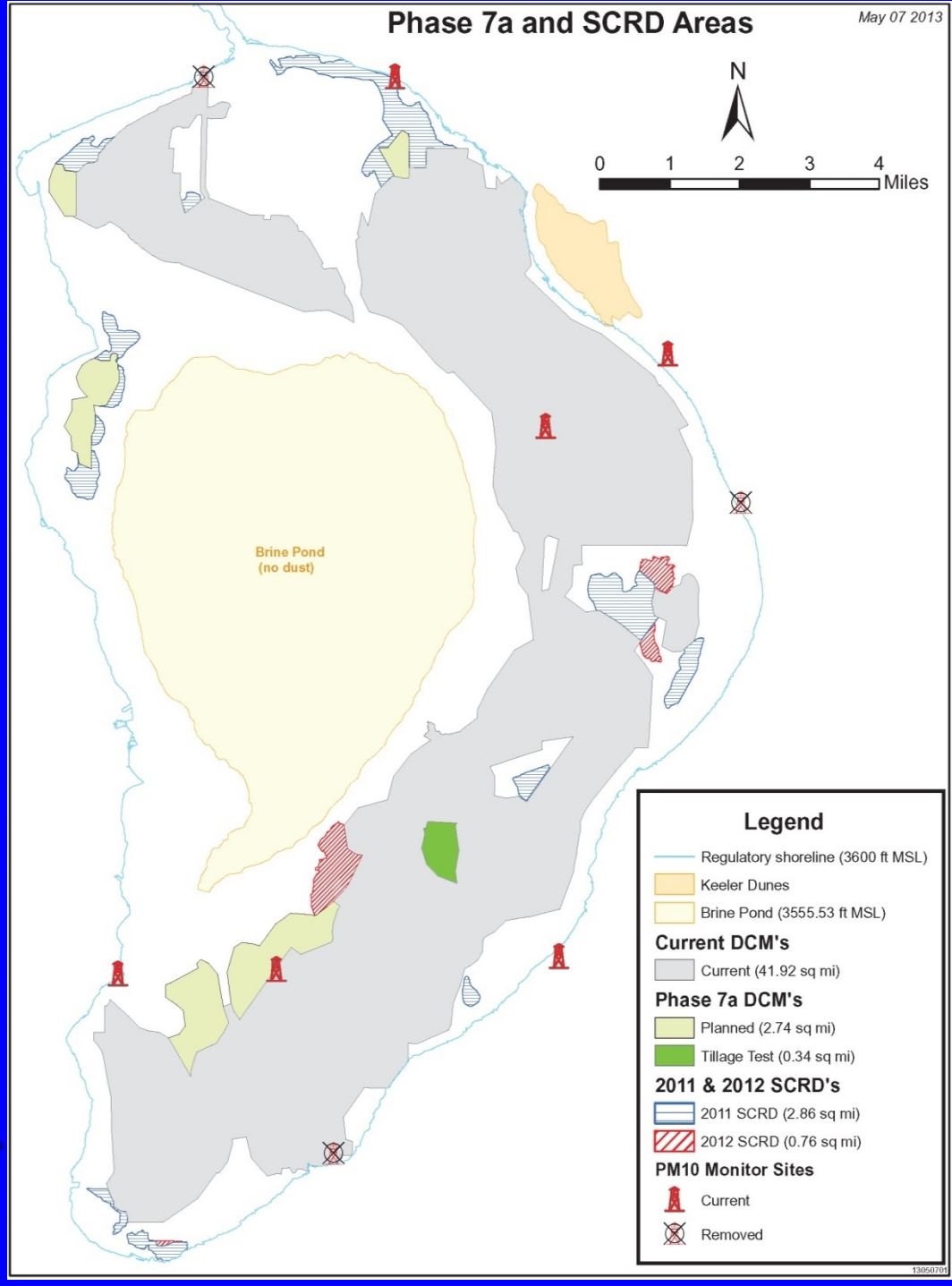
Under construction

Phase 7a 3.10 sq. mi.

Ordered

2011 Ordered 2.86
2012 Ordered 0.76
2013 Ordered 0.00
2014 (tentative) 0.00

Total required: 48.7 sq. mi. (31,000 acres)



Recent Litigation

• Two lawsuits in LA Superior Court	Withdrawn by DWP
• DWP appeals 2011 Order to ARB	ARB finds for Great Basin
• DWP appeals 2012 GB fees to ARB	Hearing held June 2013
• DWP sues in Federal Court	Dismissed by Court
• Great Basin sues for fee payment	DWP ordered to pay
• DWP cross-complaint in fee case	Dismissed by Court
• Great Basin sues for penalties	$1.2 million settlement
• DWP sues CARB and GB re: 2011	Pending in Sacramento Court
• DWP appeals 2012 Order to ARB	Hearing April 2014

In every control measure action, DWP has claimed Great Basin's air quality data is defective. <u>In every decision, the court or ARB has upheld the validity of the data</u>. This is due to the exceptional quality of the District's data collection program.

Conclusion

- In 2000, the dried bed of Owens Lake was the largest single source of particulate matter air pollution in the country.
- However, as a result of an innovative data collection program and outstanding effort by a small group of data collectors and analyzers, Great Basin has conclusively shown why the dust is emitted and where it comes from.
- This has allowed the District to order controls only where they are necessary, and
- Will result in control of this enormous air pollution source in the next few years.

But, without dedicated field technicians, none of this would be possible. We appreciate your efforts.