

# Monitoring Clean Construction

Dorian Bailey, Supervisor of Chemical/Environmental Testing  
Engineering Department/Materials Engineering Unit

[dbailey@panynj.gov](mailto:dbailey@panynj.gov)

201-216-2963

# Clean Diesel Construction Since 2003

bridges

WTC

tunnels

terminals

airports

PATH

ports



*Moving the region forward  
with hard work, key investments  
and new ideas.*



# Clean Diesel Requirements

	WTC	Agency - Wide (No NEPA)	LGA CTB	Goethals Bridge	Bayonne Bridge
Engine Tier Requirement	2	1	1	2	3
BAT Requirement	> 50 HP	50-75 DOC ok without waiver; > 75 HP requires DPF	50-75 DOC ok without waiver; > 75 HP requires DPF	> 50 HP DPF on 80% of equipment	> 50 HP DPF
Anti-Idling	X	X	X	X	X

# Do these requirements help air quality?

- Case study at the Bayonne Bridge
  - Most stringent diesel emissions requirements of any Port Authority program
  - Strict fugitive dust control program
  - Extensive air monitoring program
    - What are the concentrations of particulates during construction?

# Bayonne Bridge Navigational Clearance Project “Raise the Roadway”



Today



Future

# Bayonne Bridge Navigational Clearance Project “Raise the Roadway”

- Original structure completed in 1931
- Work initiated in May 2013
- Cost to raise 64 feet: \$1.3B
- <http://bcove.me/al8liin5>



# Residential Proximity

- **Photo credits:** [http://www.nj.com/hudson/index.ssf/2015/08/bayonne\\_bridge\\_construction\\_port\\_authority\\_city\\_of\\_11.html](http://www.nj.com/hudson/index.ssf/2015/08/bayonne_bridge_construction_port_authority_city_of_11.html)



# Air Monitoring for the BBNCP

- **“Fence Line” of earth disturbing construction activities**
  - 13 Photometric Stations
    - Fugitive dust - Particulate Matter < 10 microns (PM-10)
    - 7 NJ and 6 NY
    - Operating during construction; deployed daily
    - TSI Dustrak II Aerosol Monitor 8530
- **Community Scale/Sensitive Receptors**
  - 8 TEOM Tapered Element Oscillating Microbalance Stations
    - Operating 24/7
    - Four PM 2.5 Stations (2 NJ/2 NY)
    - Four PM10 Stations (2 NJ/2 NY)
    - Thermo Scientific 1405 (older from WTC) and dichotomous units



# Air Monitoring for the BBNCP

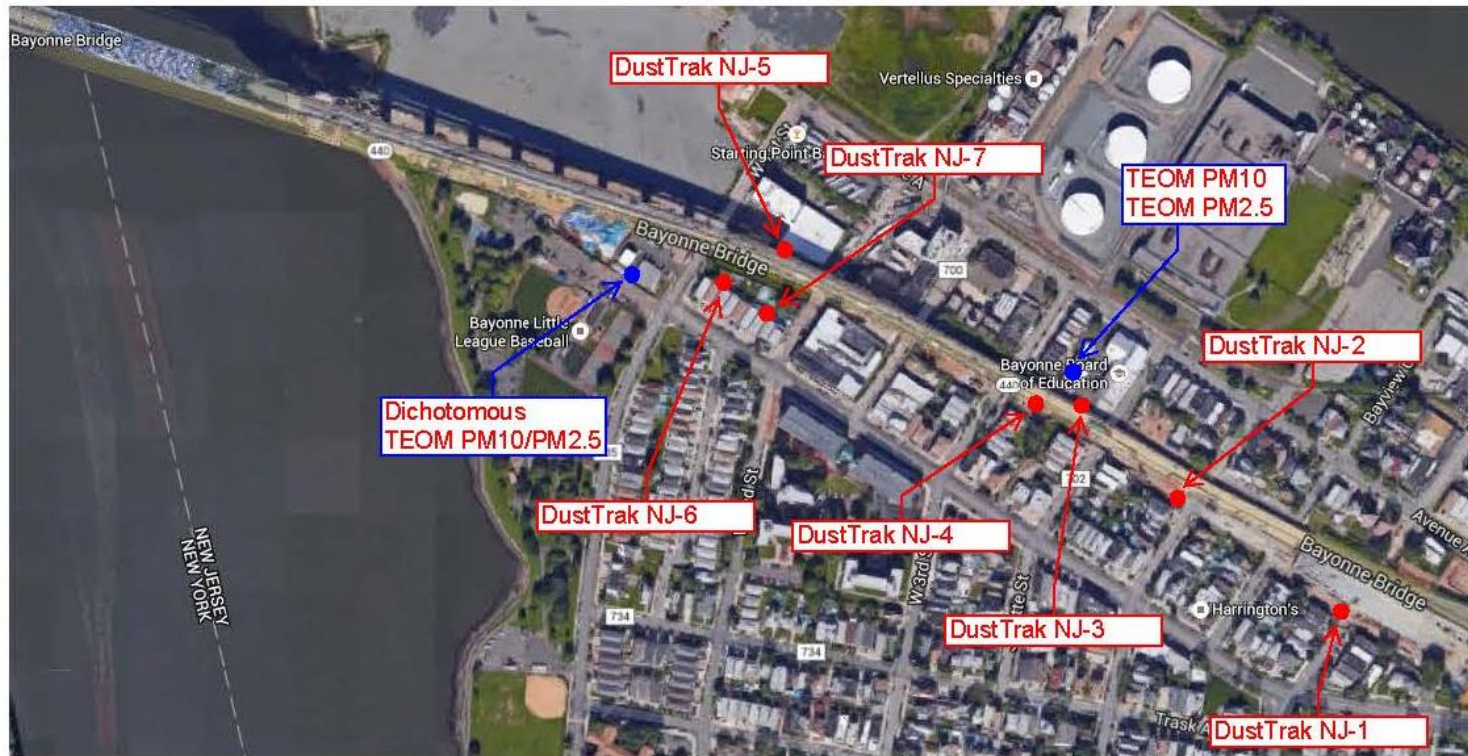
- **Monitoring Program**

- Instruments communicating through Campbell Scientific CR-200 data loggers and modems
- Real-time capture in Campbell Scientific Loggernet platform
- On-site technician response when alerts are triggered
- Data management in MS Access database
- Monthly reports shared with community

- **Action Limits**

- Fence line limits for PM-10 15 minute average: **150  $\mu\text{g}/\text{m}^3$**
- PM2.5 TEOM NAAQ (24hour/Annual): **35 / 12  $\mu\text{g}/\text{m}^3$**
- PM10 TEOM 24-hour NAAQ: **150  $\mu\text{g}/\text{m}^3$**

# NJ Air Monitoring Locations



# NY Air Monitoring Locations

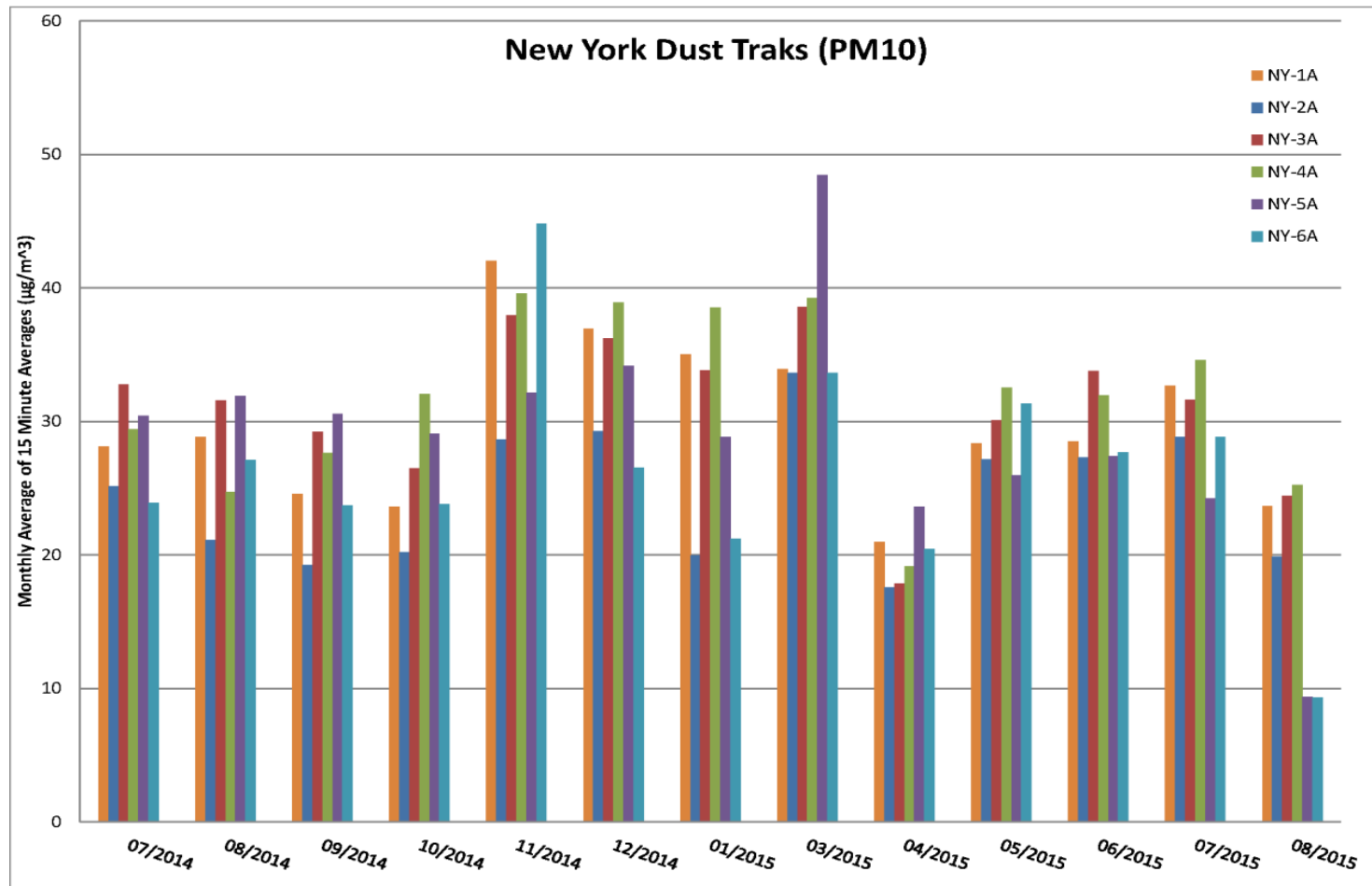


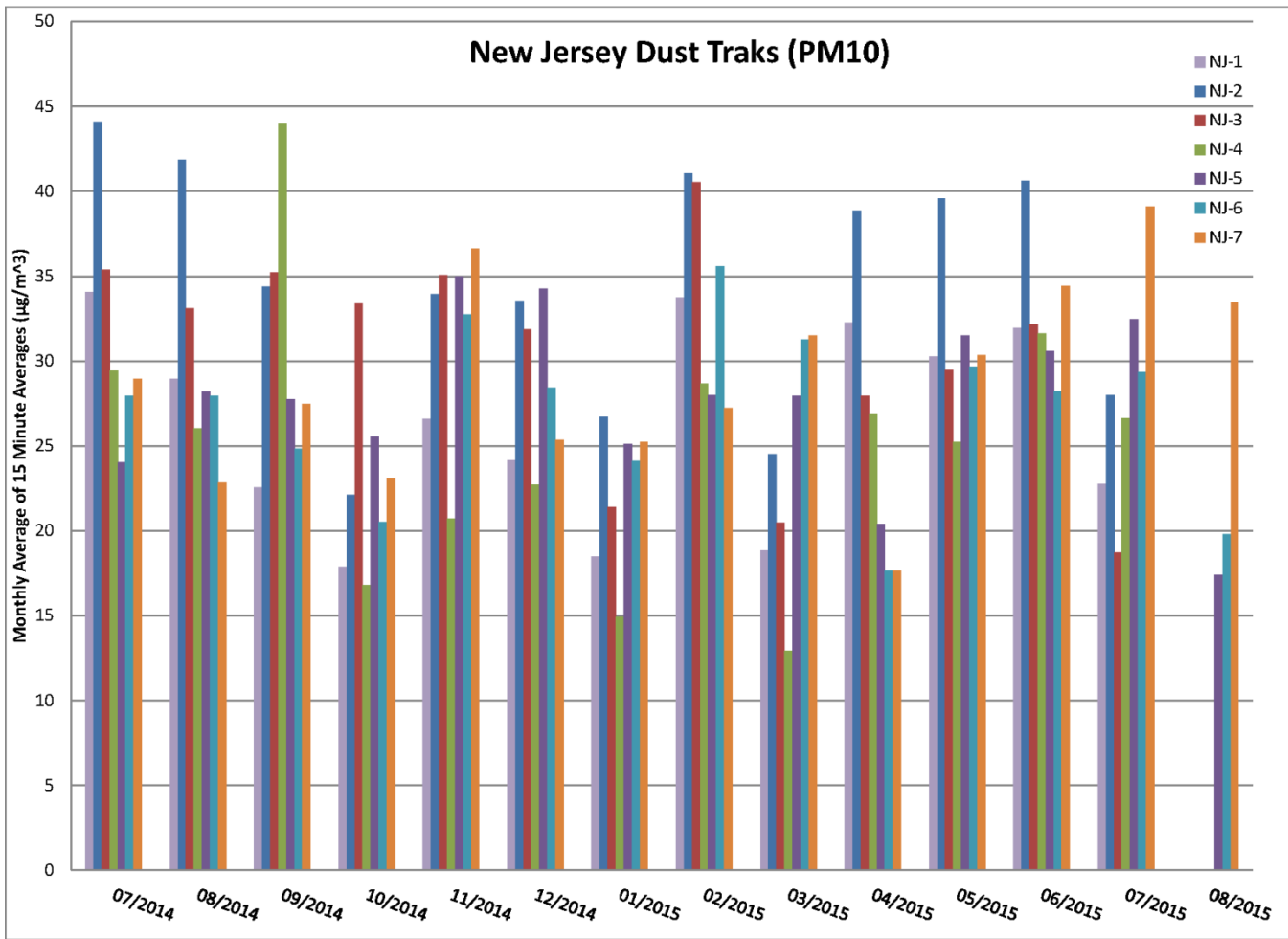
# Dustrak II Units

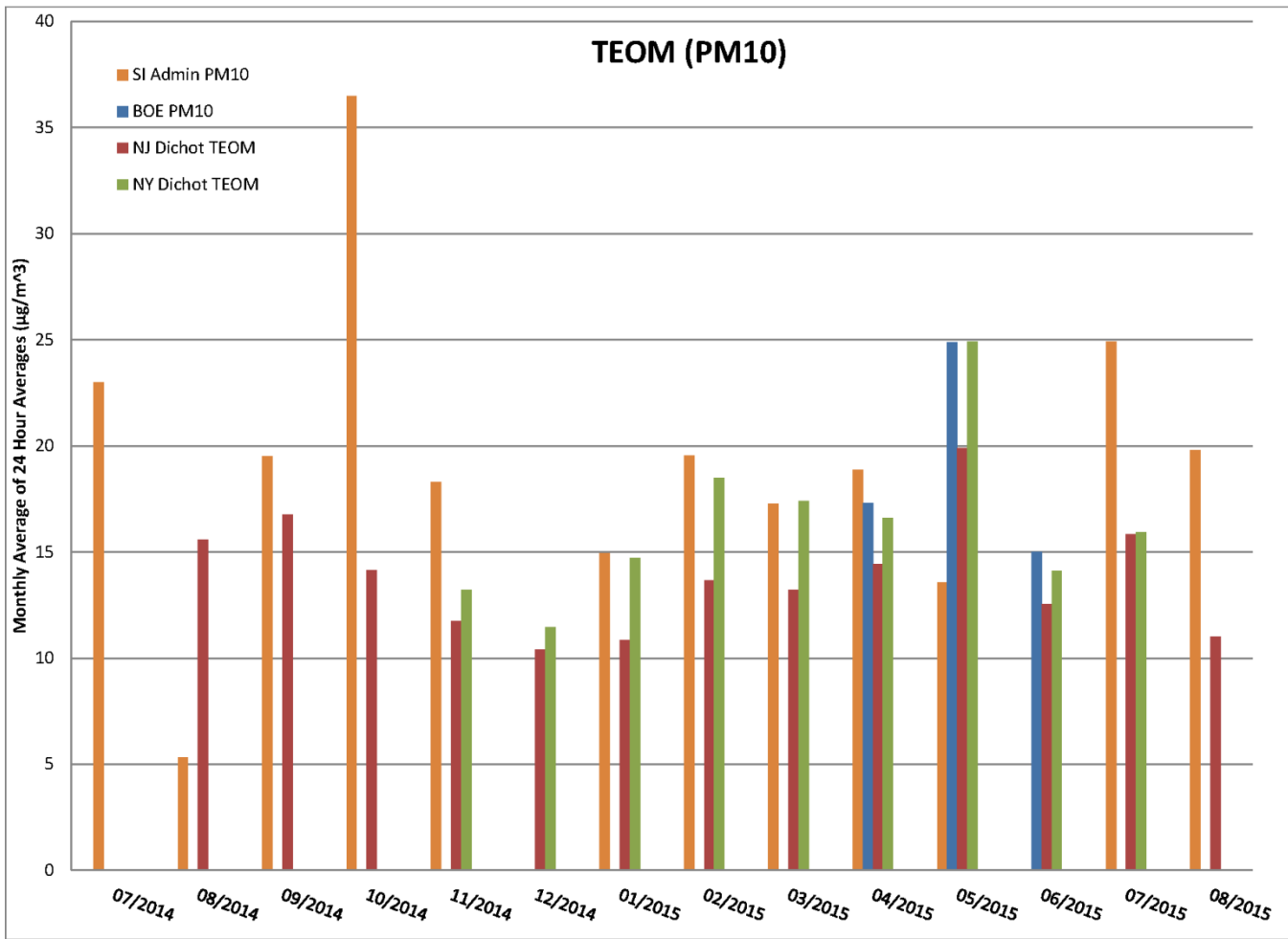


# TEOM Units

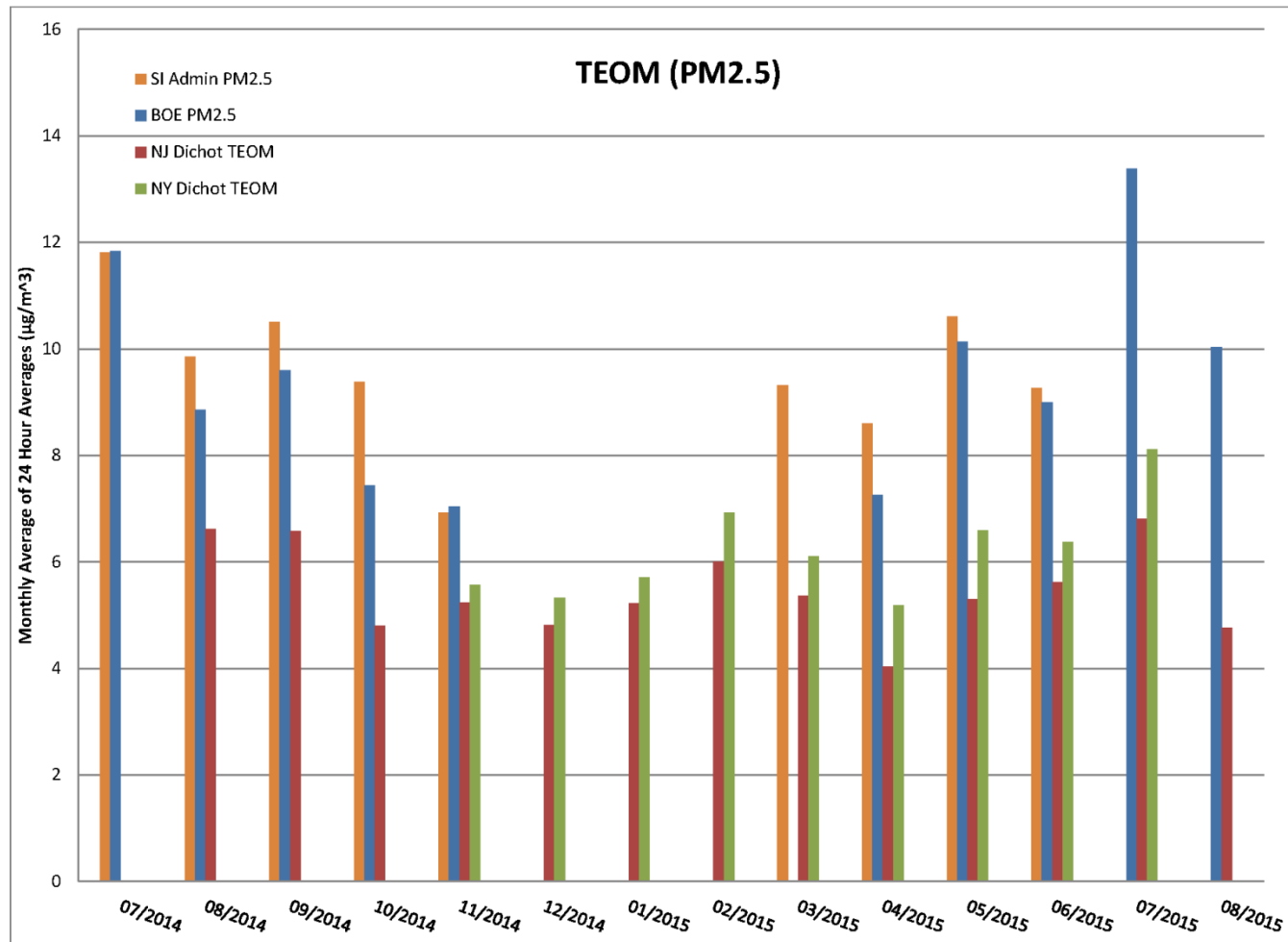












# Results and Conclusions

- Short term PM-10 spikes above 15 minute action limit do occur, but have decreased in frequency as more work is occurring aerially
- Fugitive dust mitigation and engineering controls are effective
- Data shows compliance with program action limits and NAAQs

# Acknowledgements

- PANYNJ BBNCP Program Team and Engineering Department – Construction Management Division
- PANYNJ Contractors/Consultants
  - Hampton-Clarke/Veritech
    - Matthew McArdle
    - Jason Scalora
    - Ursel Dion
  - Alpha Analytical & EST Associates
    - Safaridin Khan
    - Joshua Foster

# Questions?



Dorian Bailey

Supervisor of Chemical/Environmental Testing  
Engineering Department/Materials Engineering Unit

[dbailey@panynj.gov](mailto:dbailey@panynj.gov)

201-216-2963