

# Air Quality

*Existing Conditions and Predicted Changes due to the Proposed Compressor Station*

# Sources of Air Quality data



MassDEP sample locations selected:

- Potentially impacted by future emissions from site
- Characterize existing sources
- 1 background location

# Ambient Air Quality Guidelines

## Threshold Effects Exposure Limits (TELS)

- Non-cancer health effects
- Decreased by a factor of 5 to account for exposure from other sources (ex. water, soil)
- Compare to 24-hour average concentration

## Allowable Ambient Limits (AALs)

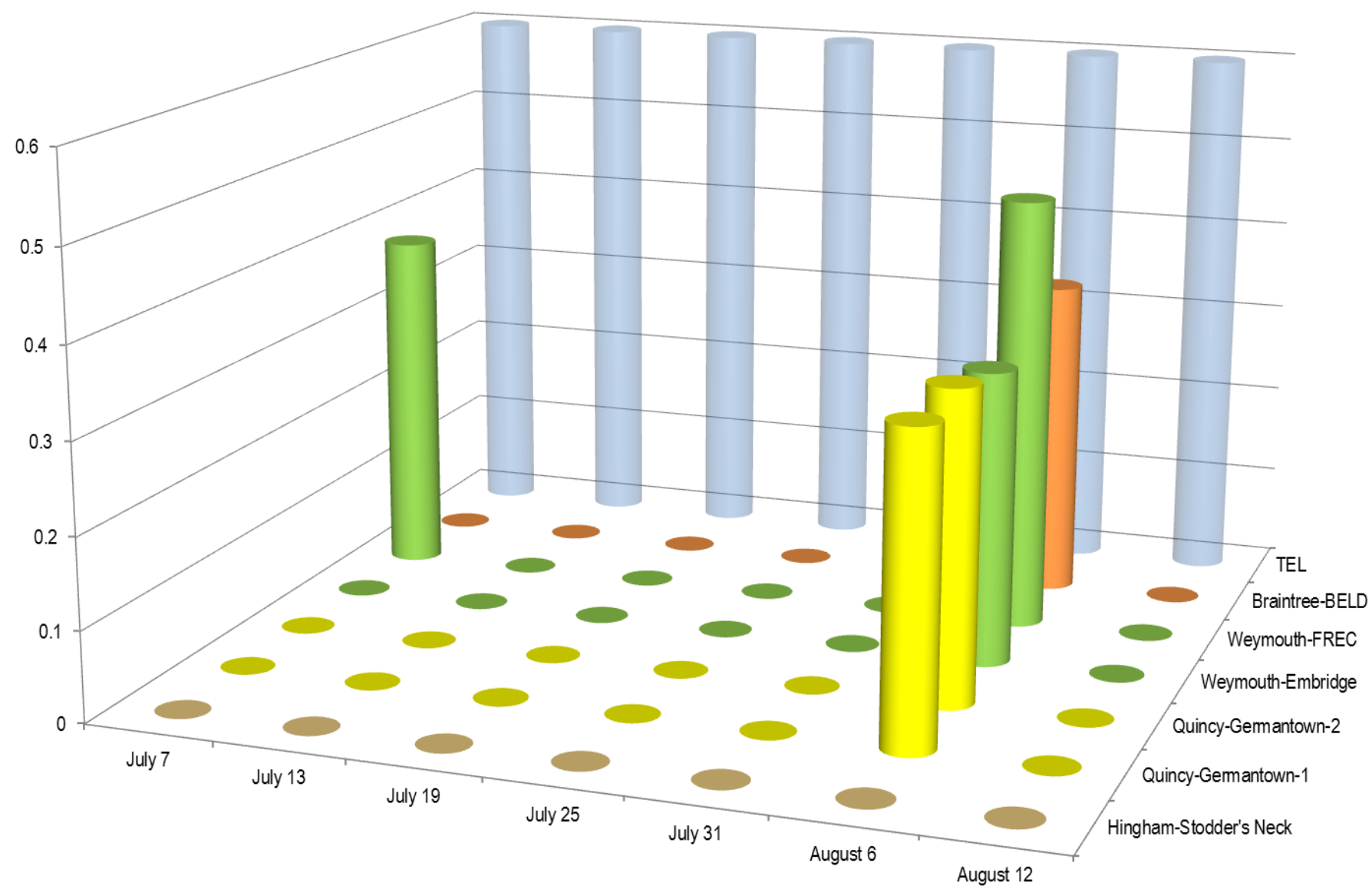
- Cancer health effects (if no cancer effects, set at TEL)
- 1 in 1 million cancer risk
- Compare to annual average concentration

TELS and AALs are intended to protect sensitive members of the population from harmful effects assuming exposure to the same average concentration 24 hours each day for a life time.

More information <https://www.mass.gov/service-details/massdep-ambient-air-toxics-guidelines>

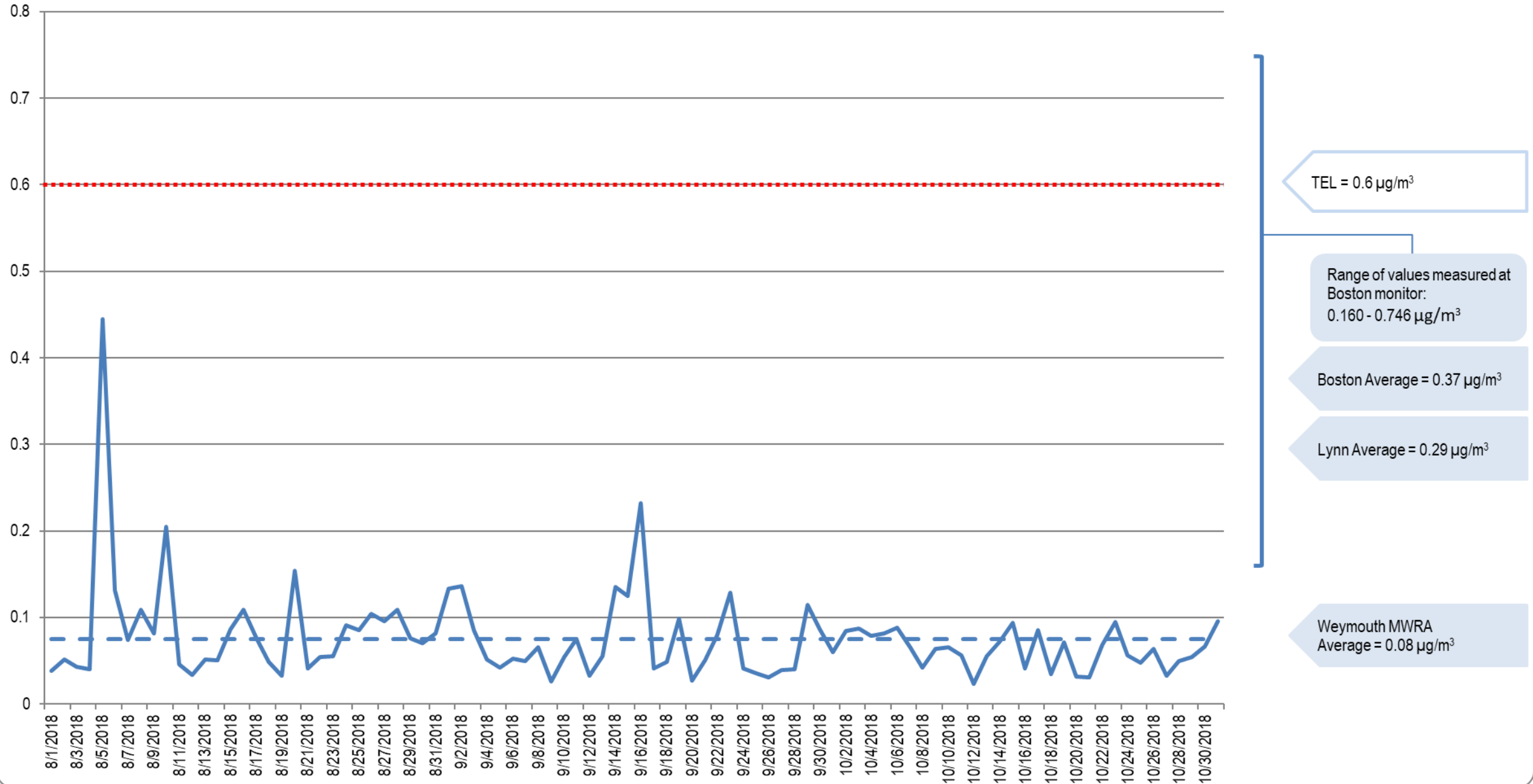
# Benzene Concentrations Relative to TEL

24 hour samples (ug/m3)



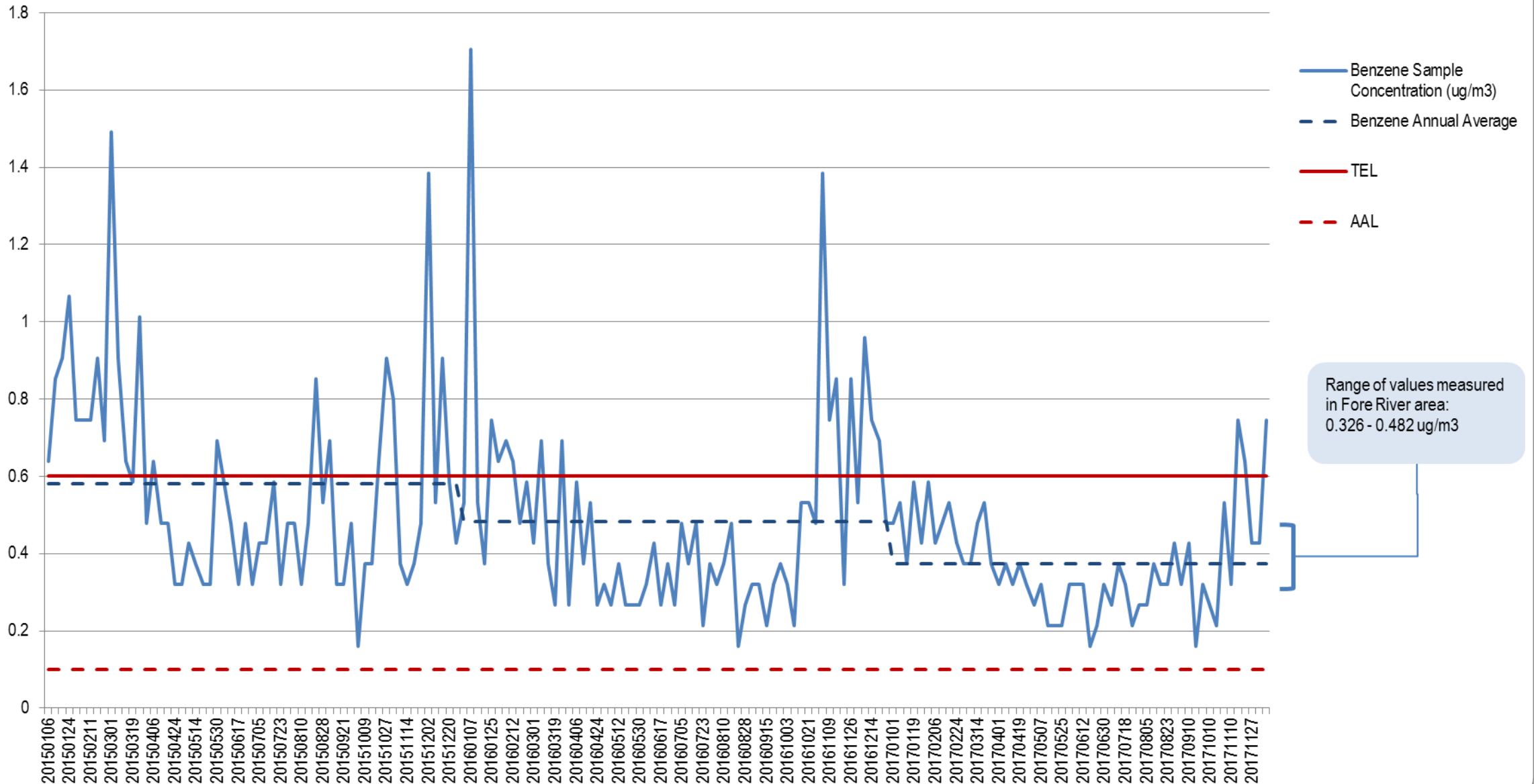
# Benzene Concentrations Relative to TEL

Gas Chromatograph Hourly Monitoring Reported as 24-hr Average Concentrations for August -October 2018 ( $\mu\text{g}/\text{m}^3$ )  
Weymouth MWRA Pump Station



# Benzene Concentrations - Boston

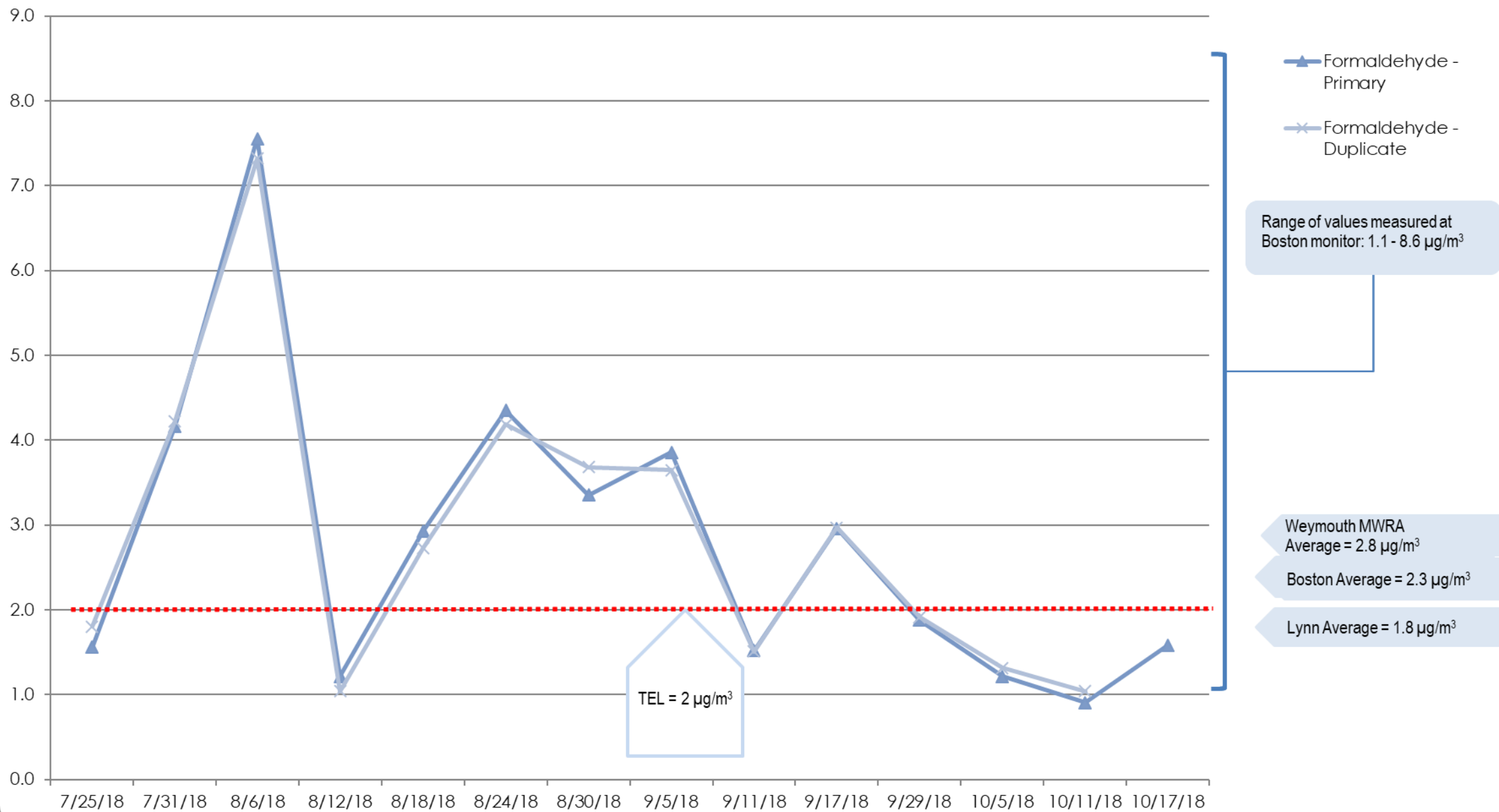
2015-2017 24-hr Samples (ug/m<sup>3</sup>)





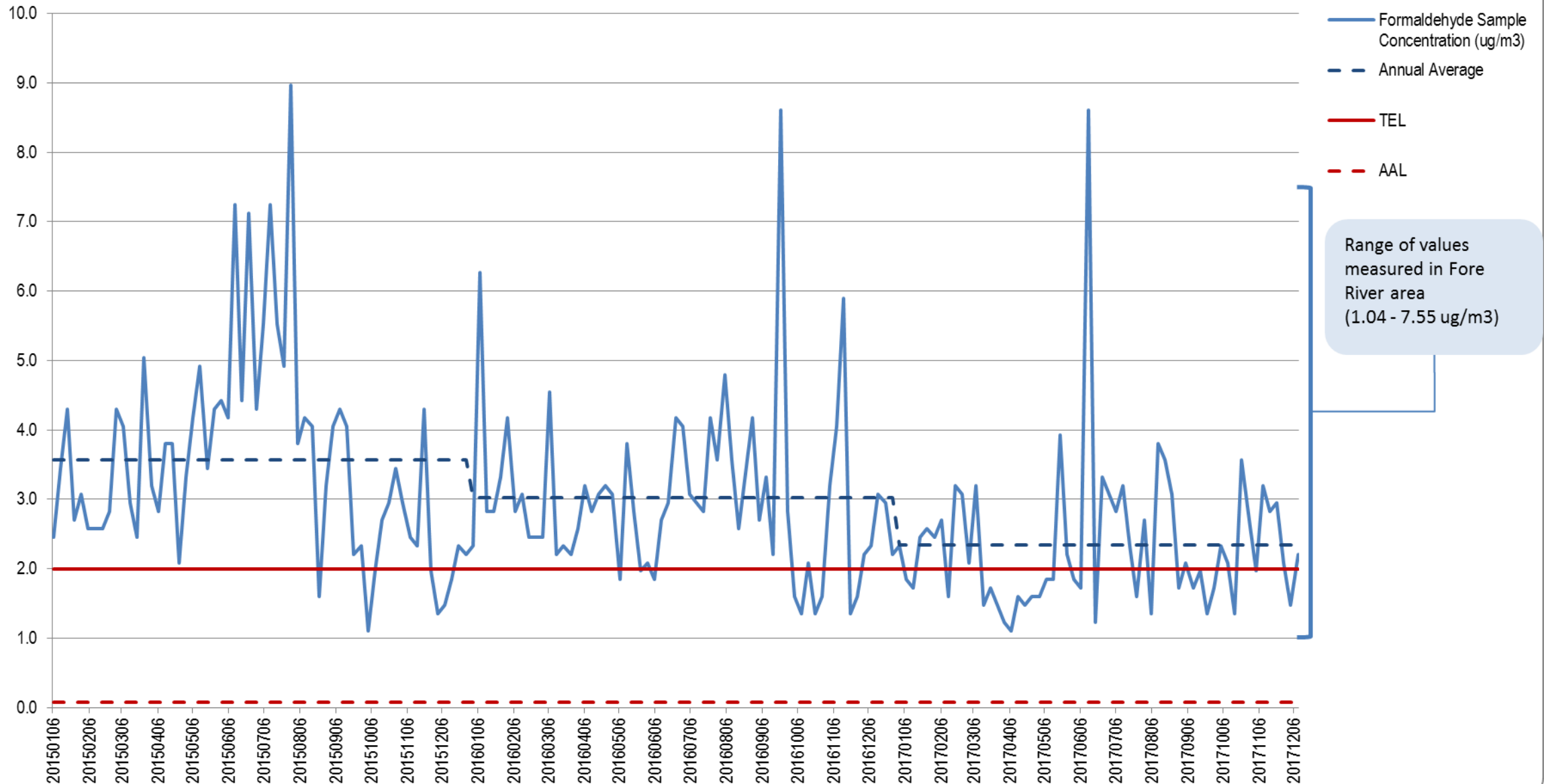
# Formaldehyde Concentrations Relative to TEL

Weymouth MWRA Pump Station 24 hour samples for July - October 2018 ( $\mu\text{g}/\text{m}^3$ )



# Formaldehyde Concentrations - Boston

2015-2017 24-hr Samples (ug/m<sup>3</sup>)





# Air Quality Data – HIA Team Observations

- VOC levels in Fore River area are similar to levels in other areas (e.g., Boston, Lynn, and Chicopee)
- VOC levels are consistent with background levels
- Some formaldehyde levels exceed the TEL; these levels are consistent with background levels
- While not directly comparable, some VOC levels exceed the AALs (e.g., formaldehyde, benzene, carbon tetrachloride); these levels are consistent with background levels

# How Projected Changes are Estimated – Air Quality Modeling

- EPA AERMOD air quality dispersion modeling uses emissions and meteorological inputs to predict concentrations of pollutants at downwind receptor locations
- Modeling is worst-case analysis
- Maximum potential emission rate for each pollutant from each emissions unit
- 5 years of meteorological data
- Calculate concentrations at receptor grid locations
- Compare concentrations to standards and guidelines



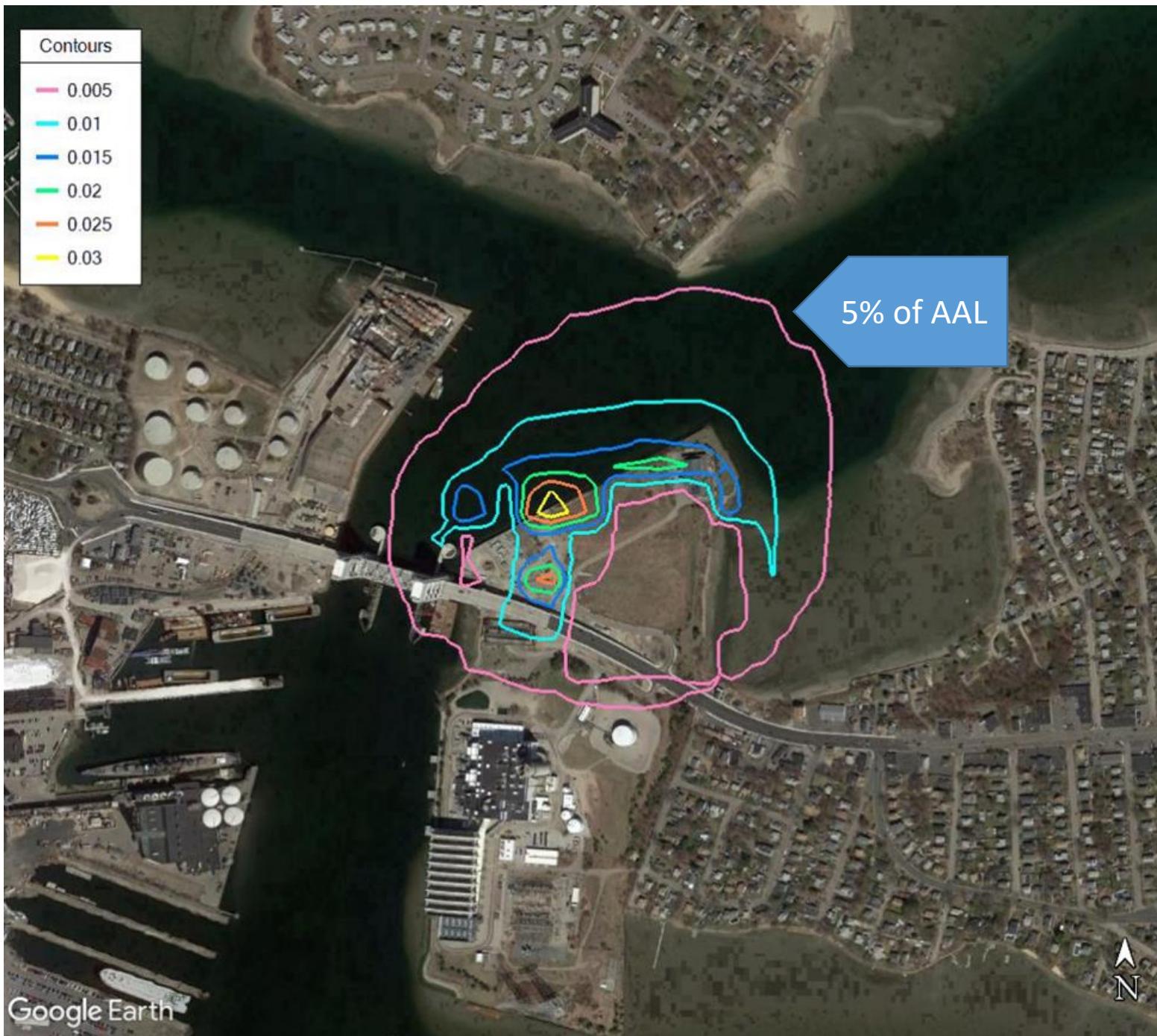
# Modeled Benzene 24-hr Concentration

Contours in  $\mu\text{g}/\text{m}^3$

Max =  $0.217 \mu\text{g}/\text{m}^3$

TEL =  $0.60 \mu\text{g}/\text{m}^3$





# Modeled Benzene Annual Concentration

Contours in  $\mu\text{g}/\text{m}^3$

Max =  $0.0426 \mu\text{g}/\text{m}^3$

AAL =  $0.10 \mu\text{g}/\text{m}^3$





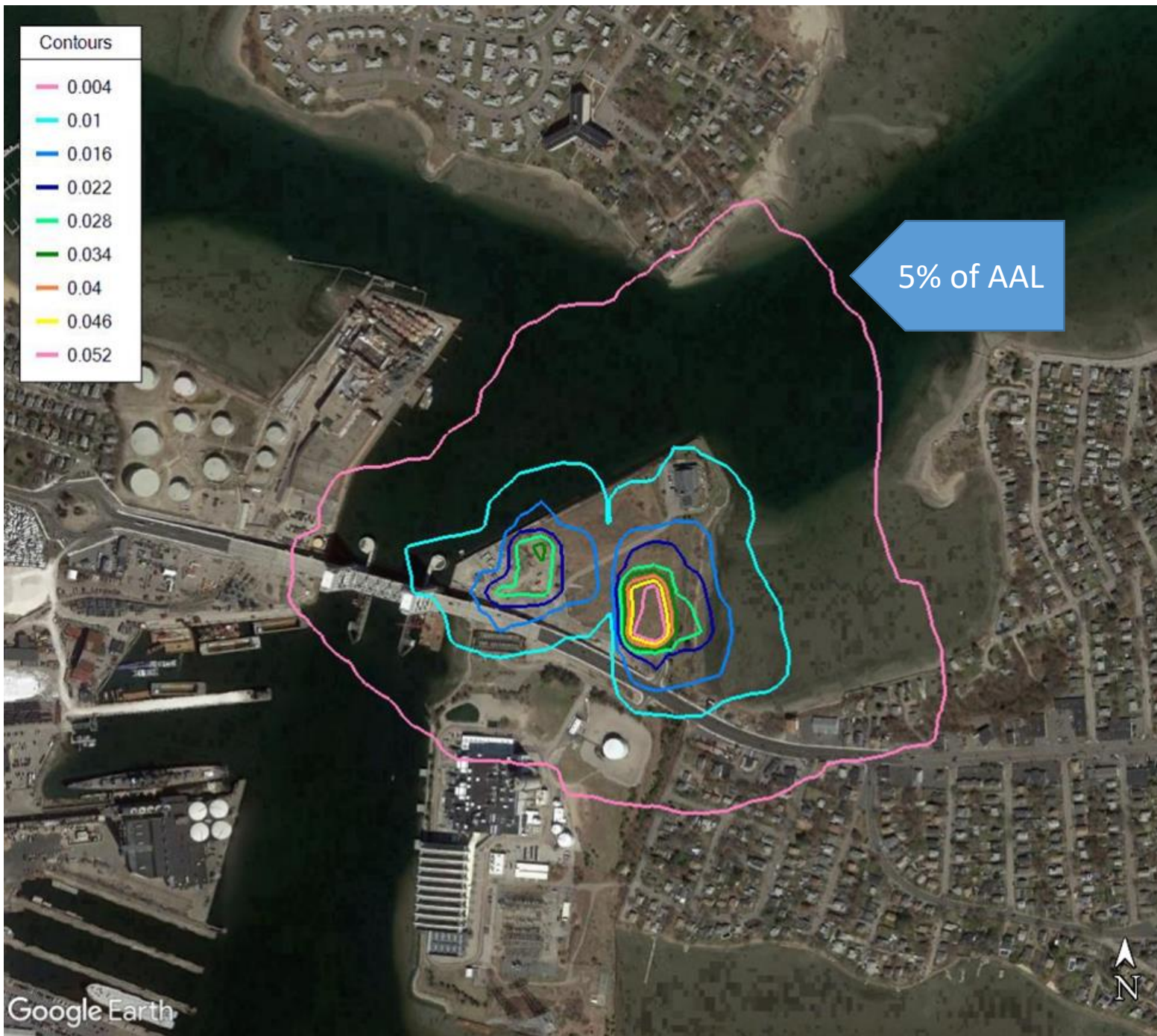
# Modeled Formaldehyde 24-hr Concentration

Contours in  $\mu\text{g}/\text{m}^3$

Max =  $0.386 \mu\text{g}/\text{m}^3$

TEL =  $2 \mu\text{g}/\text{m}^3$





# Modeled Formaldehyde Annual Concentration

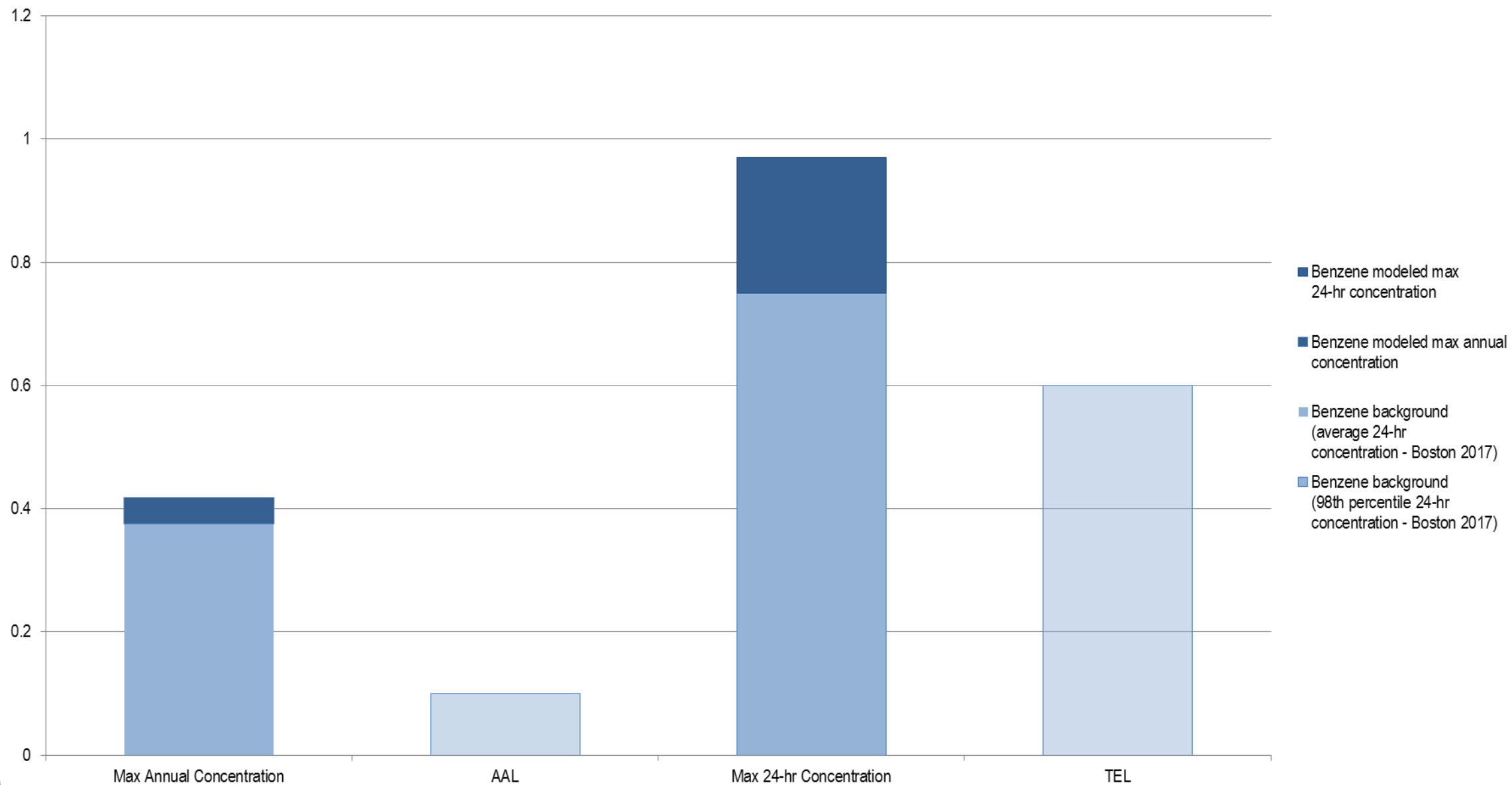
Contours in  $\mu\text{g}/\text{m}^3$

Max =  $0.0554 \mu\text{g}/\text{m}^3$

AAL =  $0.08 \mu\text{g}/\text{m}^3$

# Benzene – Background Plus Modeled Maximum

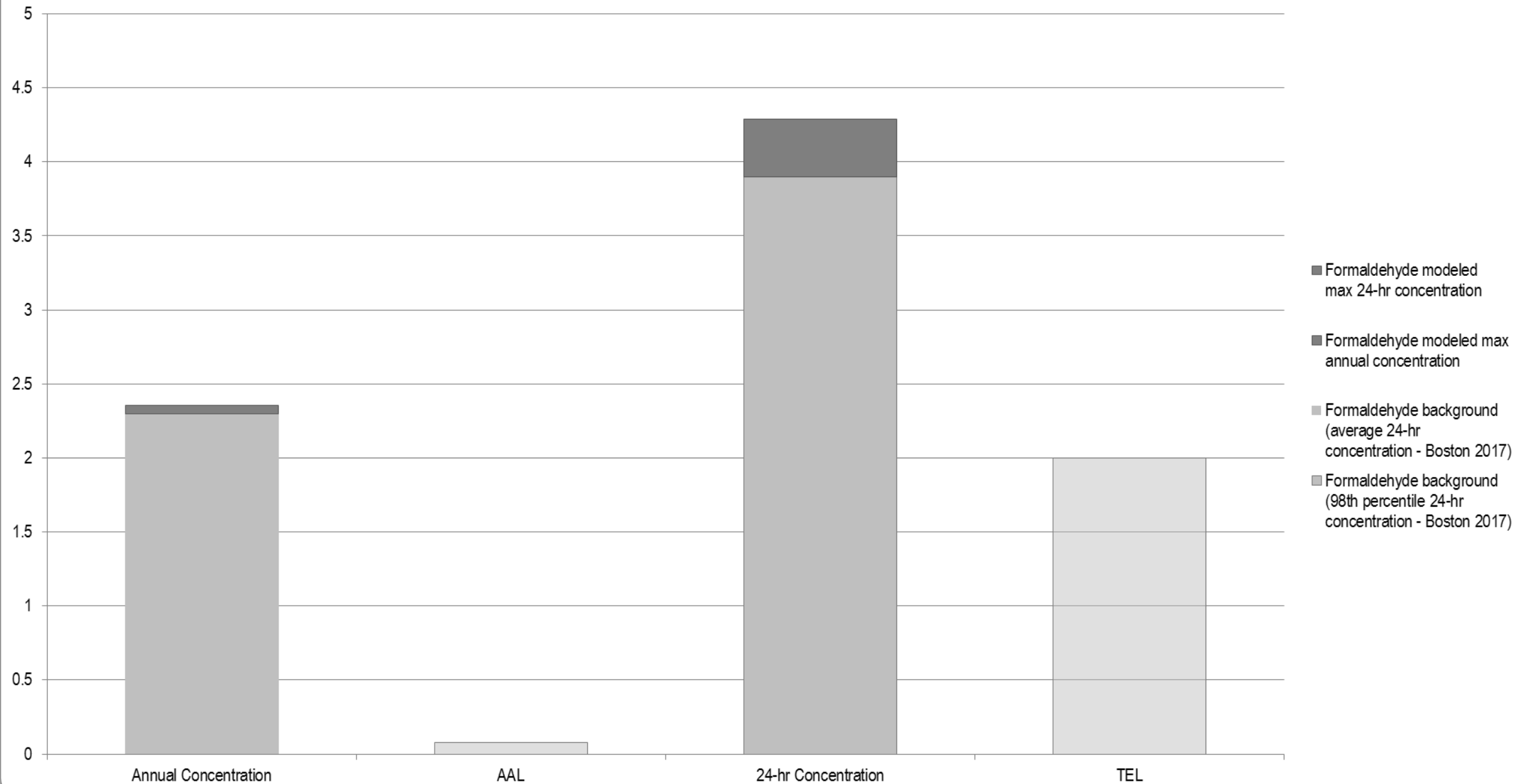
( $\mu\text{g}/\text{m}^3$ )





# Formaldehyde – Background Plus Modeled Maximum

( $\mu\text{g}/\text{m}^3$ )



# Group Discussion of Air Quality Impact Pathway

- What are your observations?
- What questions remain?
- What else would be helpful to know?

