

Country Report on Monitoring status, Needs and Plan

**Presented By
Quazi Sarwar Imtiaz Hashmi
Director (Planning)
Dept. of Environment, Dhaka, Bangladesh**

Outline of Presentation

- Monitoring Activities
- Dry Deposition monitoring
- Graphical data of PM_{10} , SO_x , NO_x
- Observation of data
- Wet deposition monitoring
- Graphical data of P^H , EC, SO_4^{2-} , Cl^- , NO_3^- , Na^+ , K^+ , Mg^{2+} , Ca^{2+}
- Observation of Data
- Needs
- Future plan

Monitoring Activities Under Male' declaration

Project in Bangladesh

- Two types of monitoring
 - Dry Deposition Monitoring
 - Wet Deposition Monitoring

In Dry Deposition Monitoring

- Metrological Data
- Field Temperature
- Air Quality Monitoring

In Wet deposition Monitoring

- Rain water Quality Test
- Precipitation Amount

Dry Deposition

● Metrological Data

- Metrological Parameters are
 - ❖ Wind Direction
 - ❖ Wind Speed
 - ❖ Solar Radiation
 - ❖ Av. Rain Fall
- All Metrological Parameters have been being monitored by Metrological Department, Shatkhira
- Male' station personnel has been collecting data from metrological Dept monthly basis.
- Data have been being sent to UNEP through NIA (DP of Male')
- The metrological Data is very important for measurement of Air Quality Parameters by Passive Sampler

Dry Deposition

- **Field Temperature**

- Field Temperature has been being monitored by Station Personnel every day basis.
- The recorded temperature has been sent to UNEP through NIA (PD of Male')
- The Field Temperature is very important for measurement of air Quality

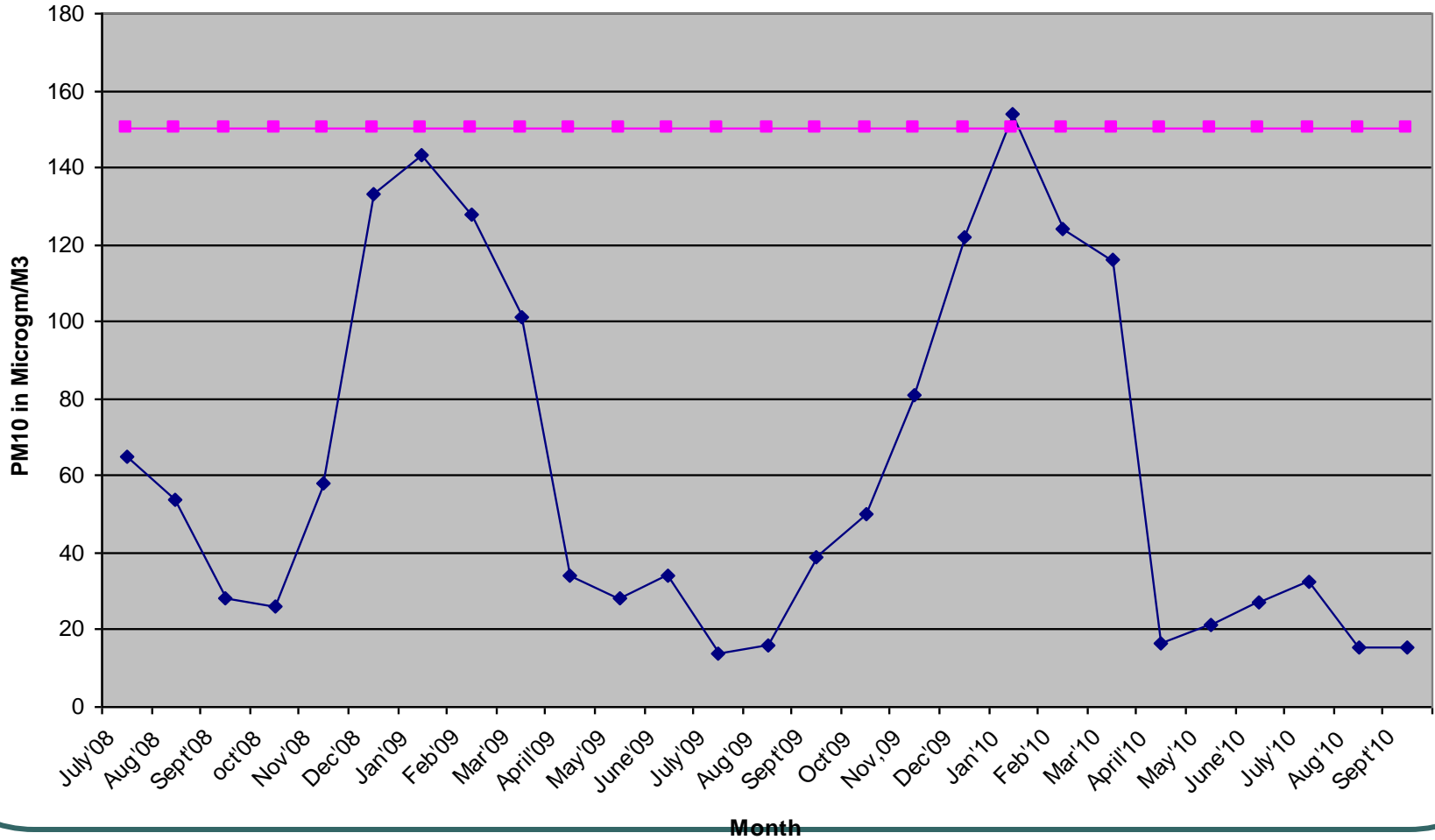
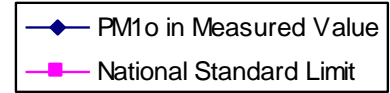
Dry Deposition

- Air Quality

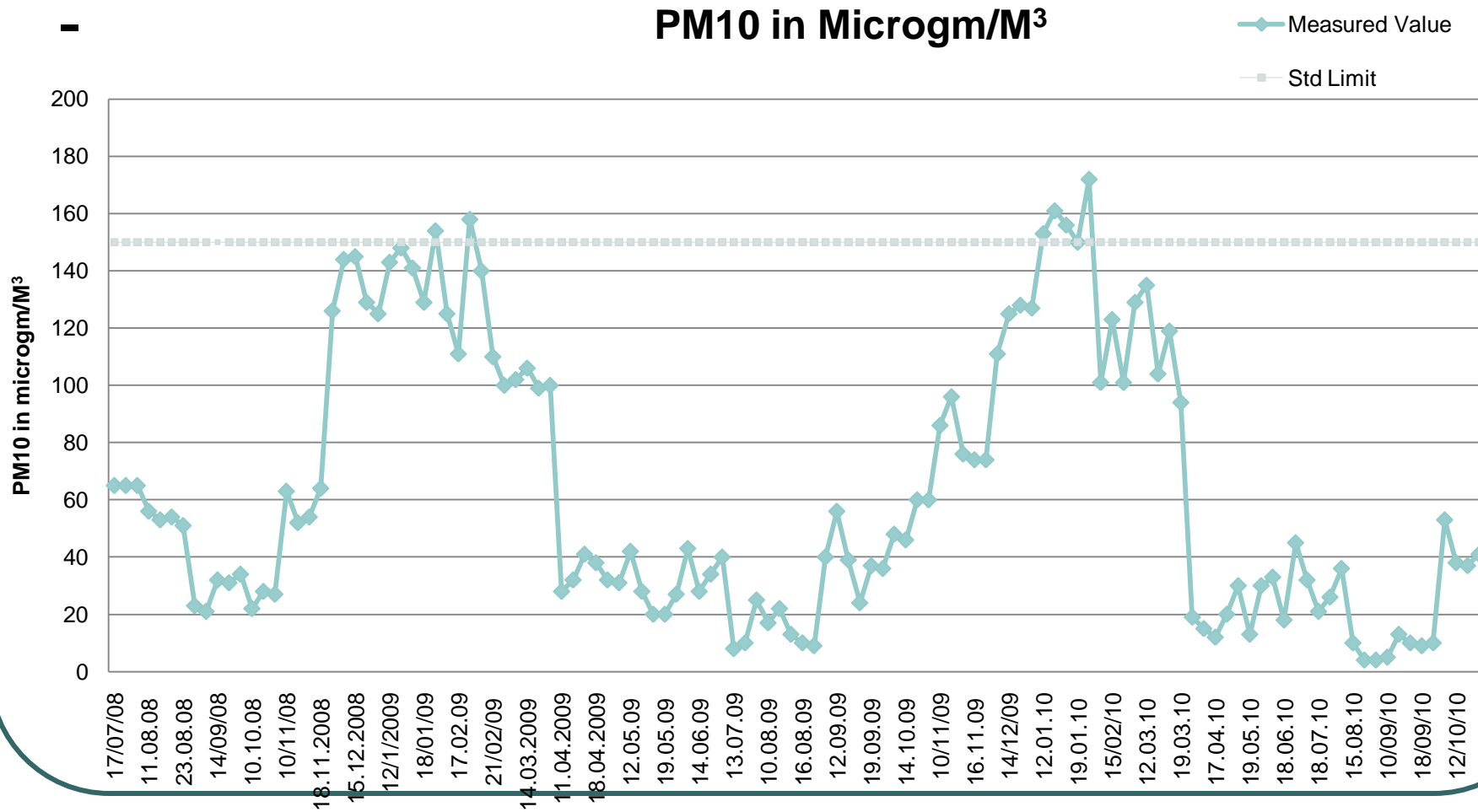
- The parameters are :
 - ❖ PM10 (Particulate Matter 10micron)
 - ❖ SOX (Oxide of Sulfure)
 - ❖ NOX (Oxide of Nitrogen)
 - ❖ O3 (Ozone)
- PM10 has been monitored by High Volume sampler (HVS) and measured in Khulna Male Lab
- SOx, NOx and O3 have been Monitored by passive sampler and samples have been sent IVL (Swedish Environmental Lab) for analysis
- Require Instruments are:
 - ❖ High Volume Sampler (HVS)
 - ❖ Electric Balance(Four Digits)
 - ❖ Desiccators

Particulate Matter (PM₁₀)

Month Average PM₁₀

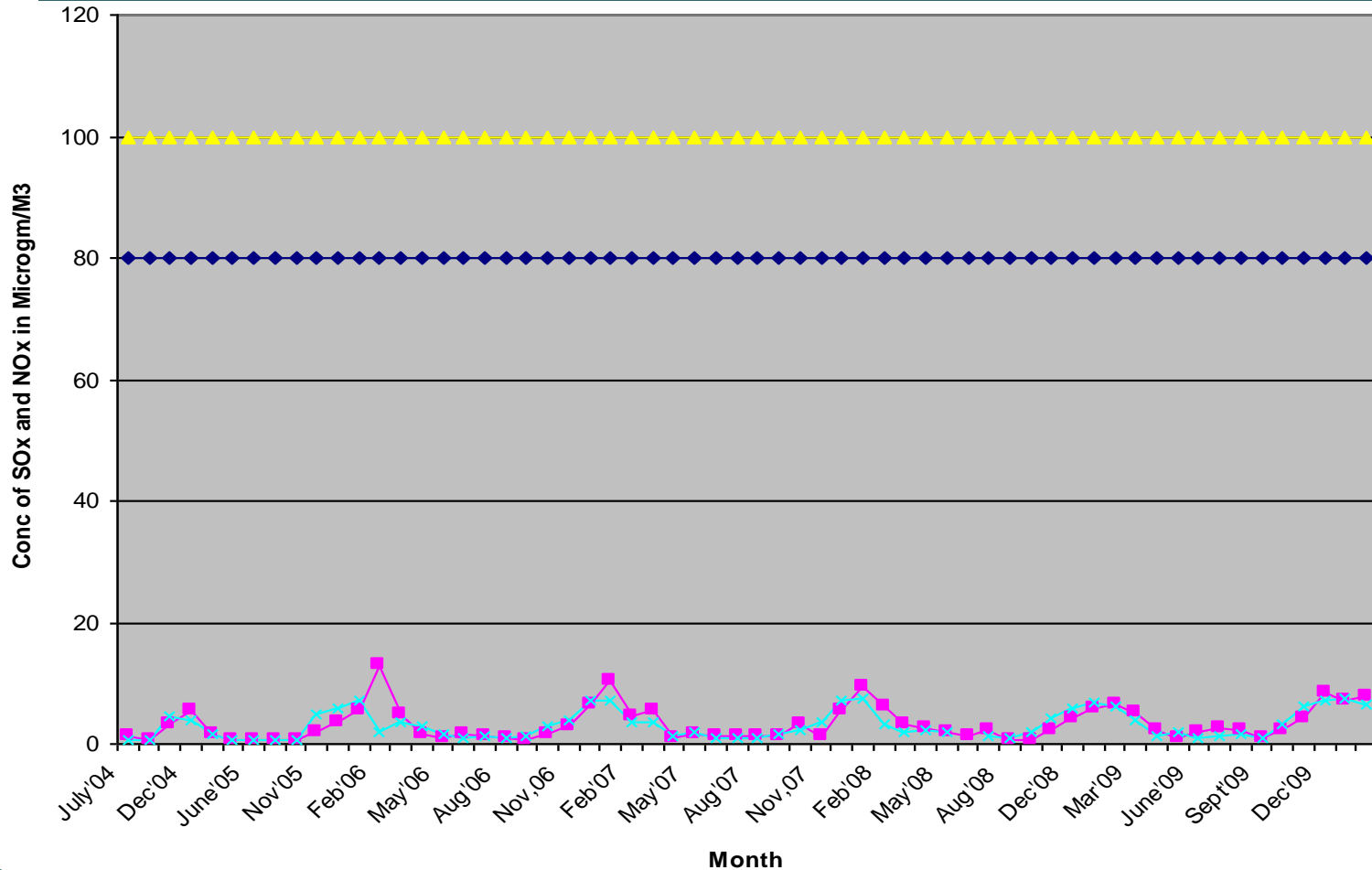
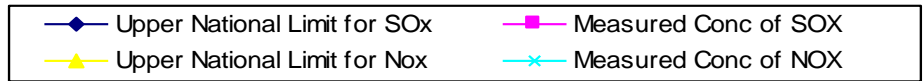


PM₁₀ Conc. Of Ambient Air (24hrs Av. Data)

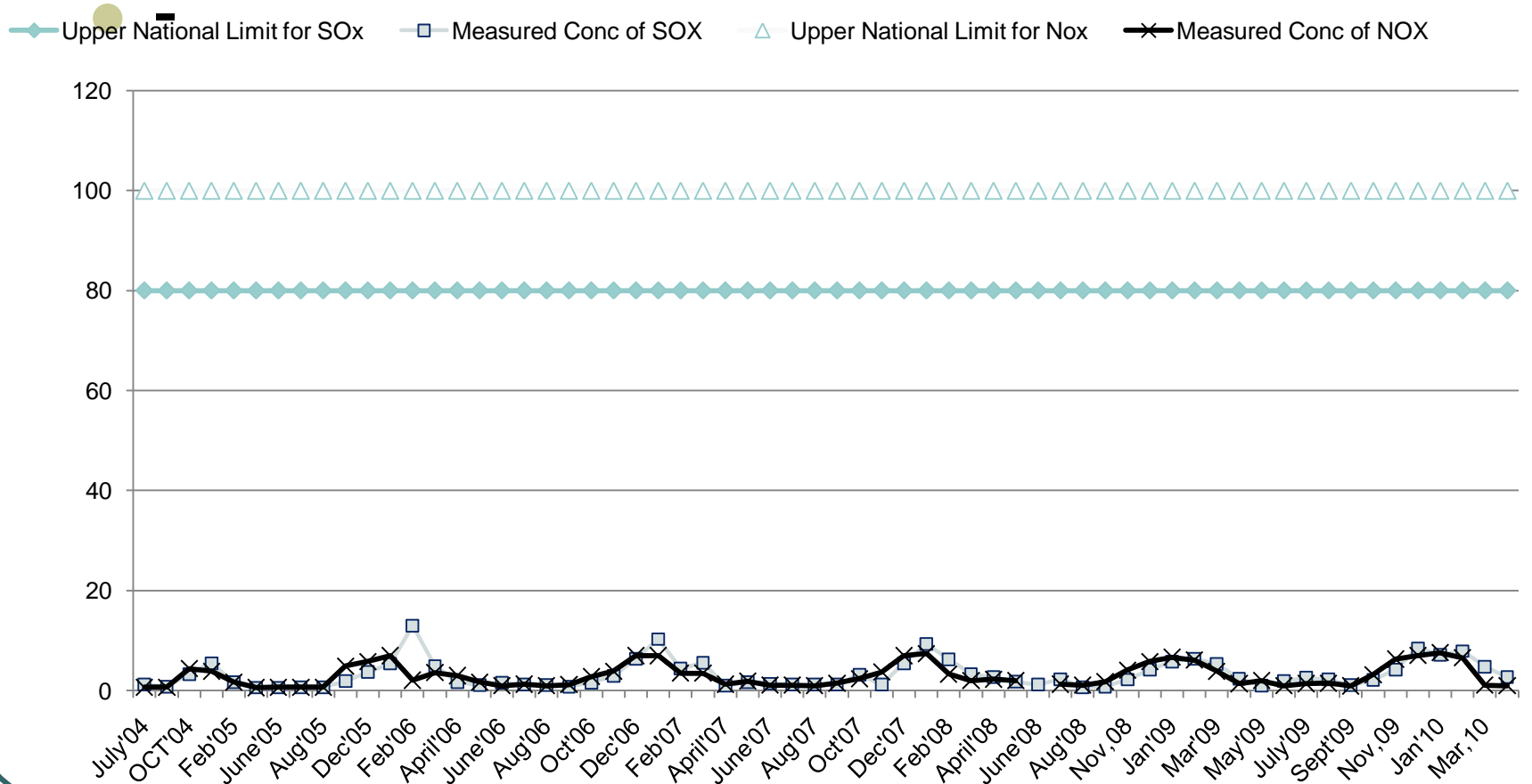


Conc. of SOx and NOx in Air

Conc of SOx and NOx in Air



Ambient Conc. Of SO_x and NO_x in Air by Passive sampler



Observation about Dry Deposition

- PM₁₀ sampling by High volume sampler has been taken five day in month and duration of sampling 24 hours.
- The result shown in the graph is Month average value.
- The Highest PM₁₀ Value is in January.
- Higher PM₁₀ Value is Dec to Mar
- The passive samplers and field blank have been exposed in air at male station and duration is one Month.
- The SOX and NOX are not monitored by High volume sampler because the values are below detection limit.

Wet Deposition

- Precipitation amount
-

- Rain water Quality

➤ The Monitoring Parameters are:

❖ pH

❖ EC

❖ Sodium ion (Na^+), Potassium Ion (K^+), Calcium (Ca^{2+}), Magnesium (Mg^{2+}), Ammonium (NH_4^+)

❖ Sulfate (SO_4^{2-}), Nitrate (NO_3^-), Chloride (Cl^-)

➤ The used Instruments are

❖ Bulk Collector

❖ Rain Collector

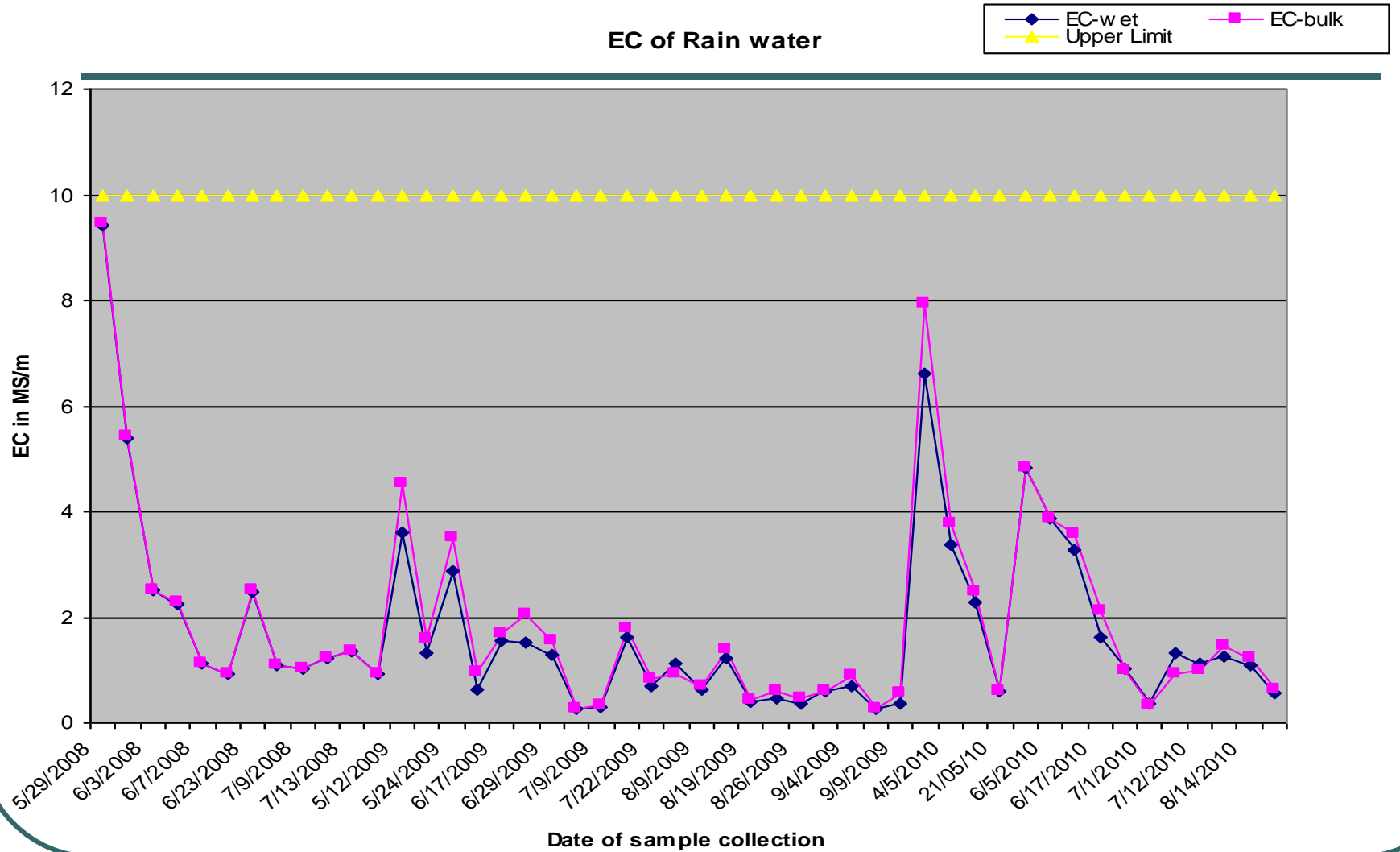
❖ pH Meter, EC meter

❖ Atomic absorption spectrometer

❖ Spectrophotometer

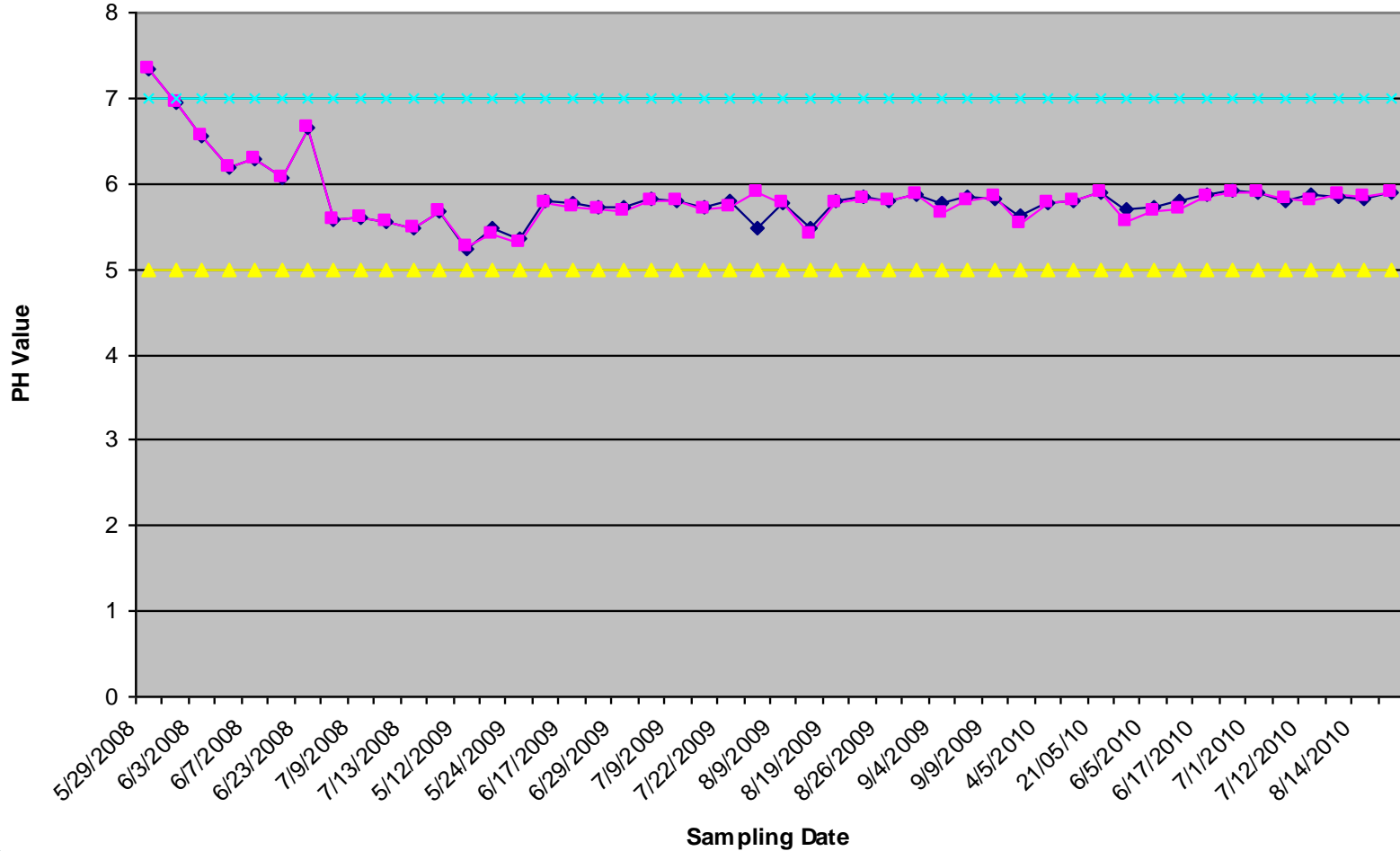
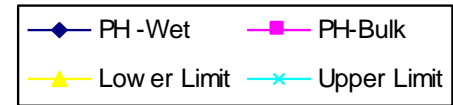
❖ Digital Balance

EC of Rain water (bulk and wet only collector) in mS/m



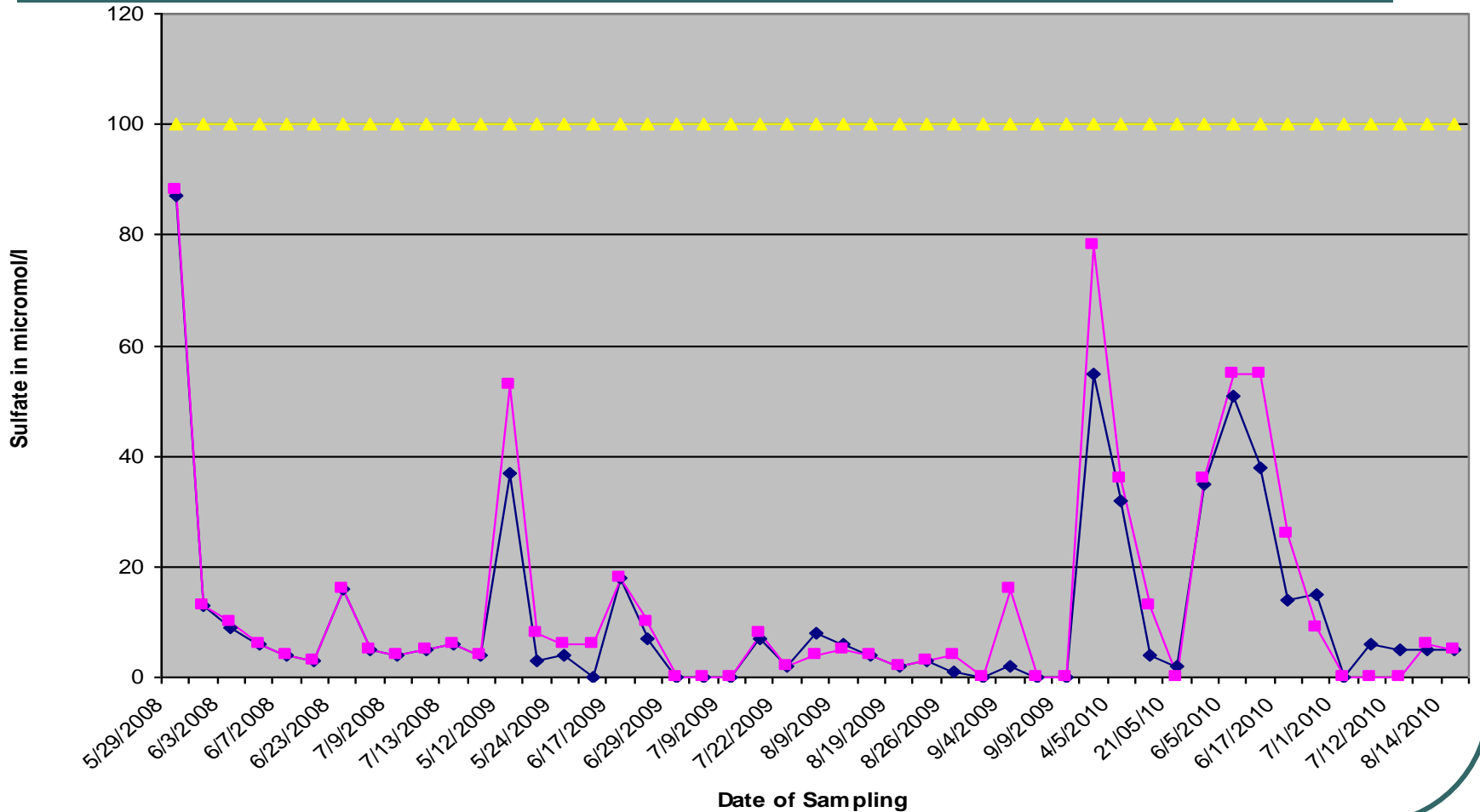
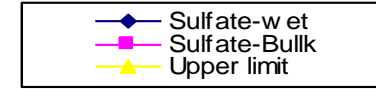
PH of Rain water (bulk and wet only collector)

PH of rain water



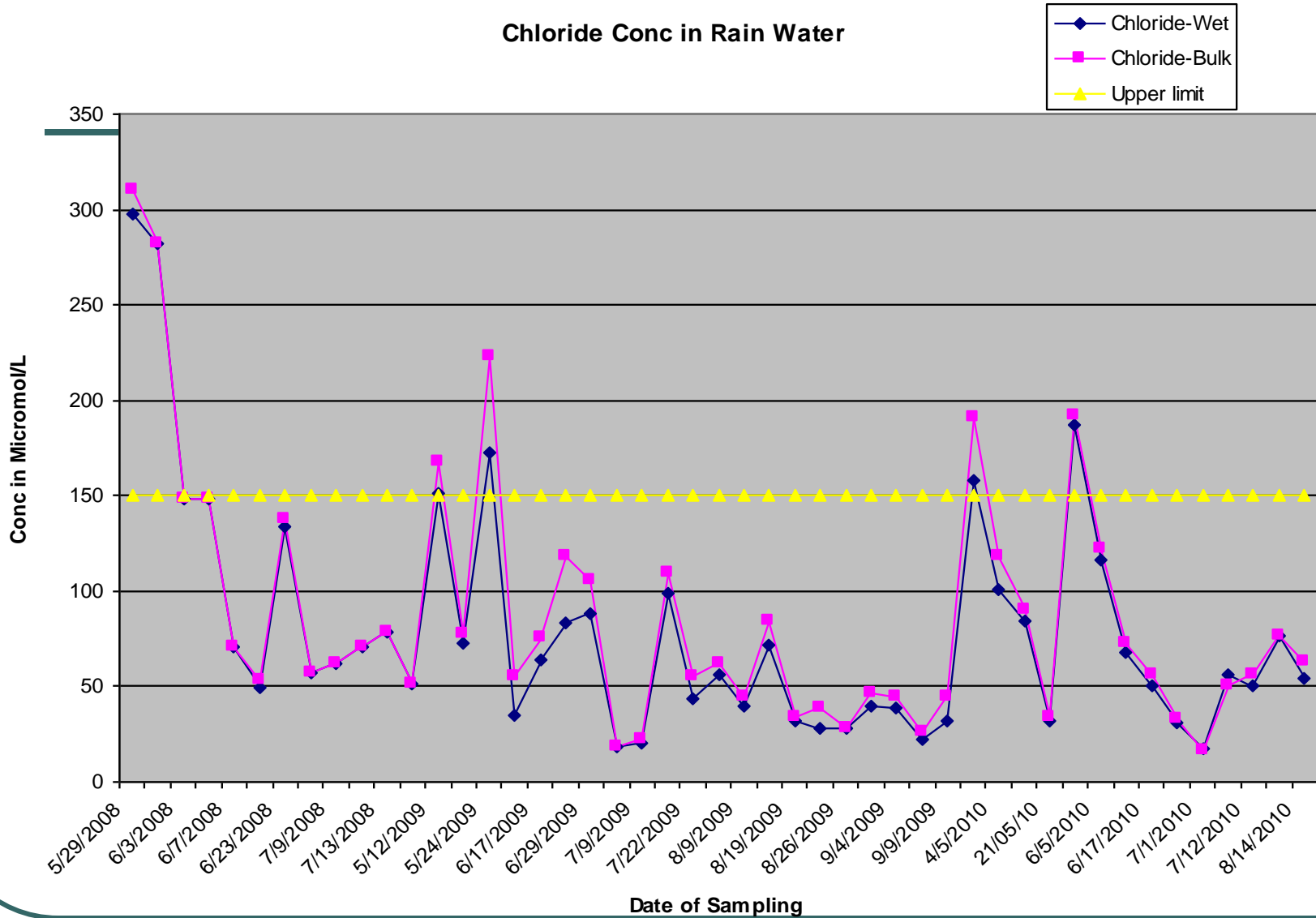
Sulfate conc of Rain water (bulk and wet only collector) in $\mu\text{mol/L}$

Sulfate conc of Rain water

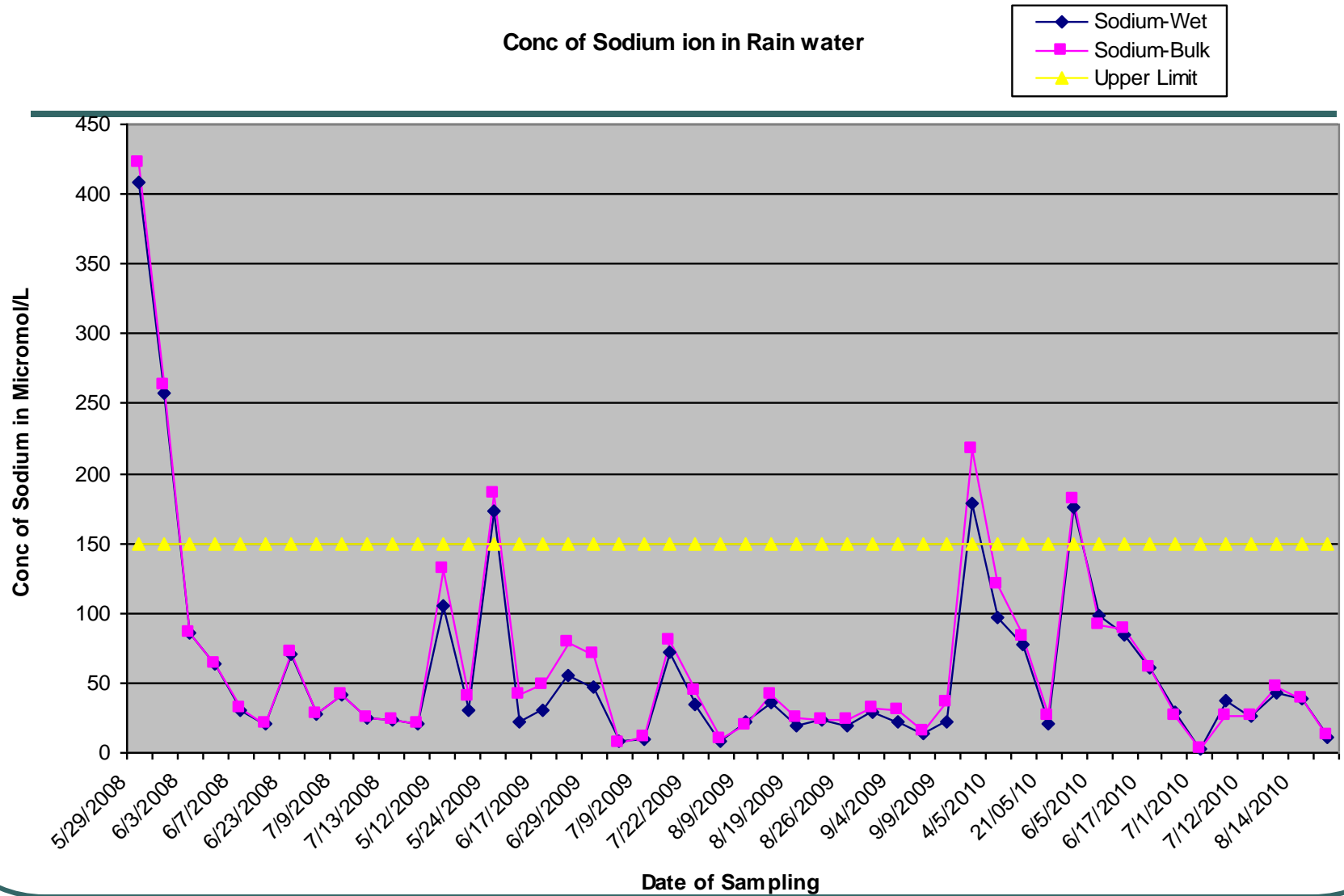


Chloride conc of Rain water (bulk and wet only collector) in $\mu\text{mol/L}$

Chloride Conc in Rain Water

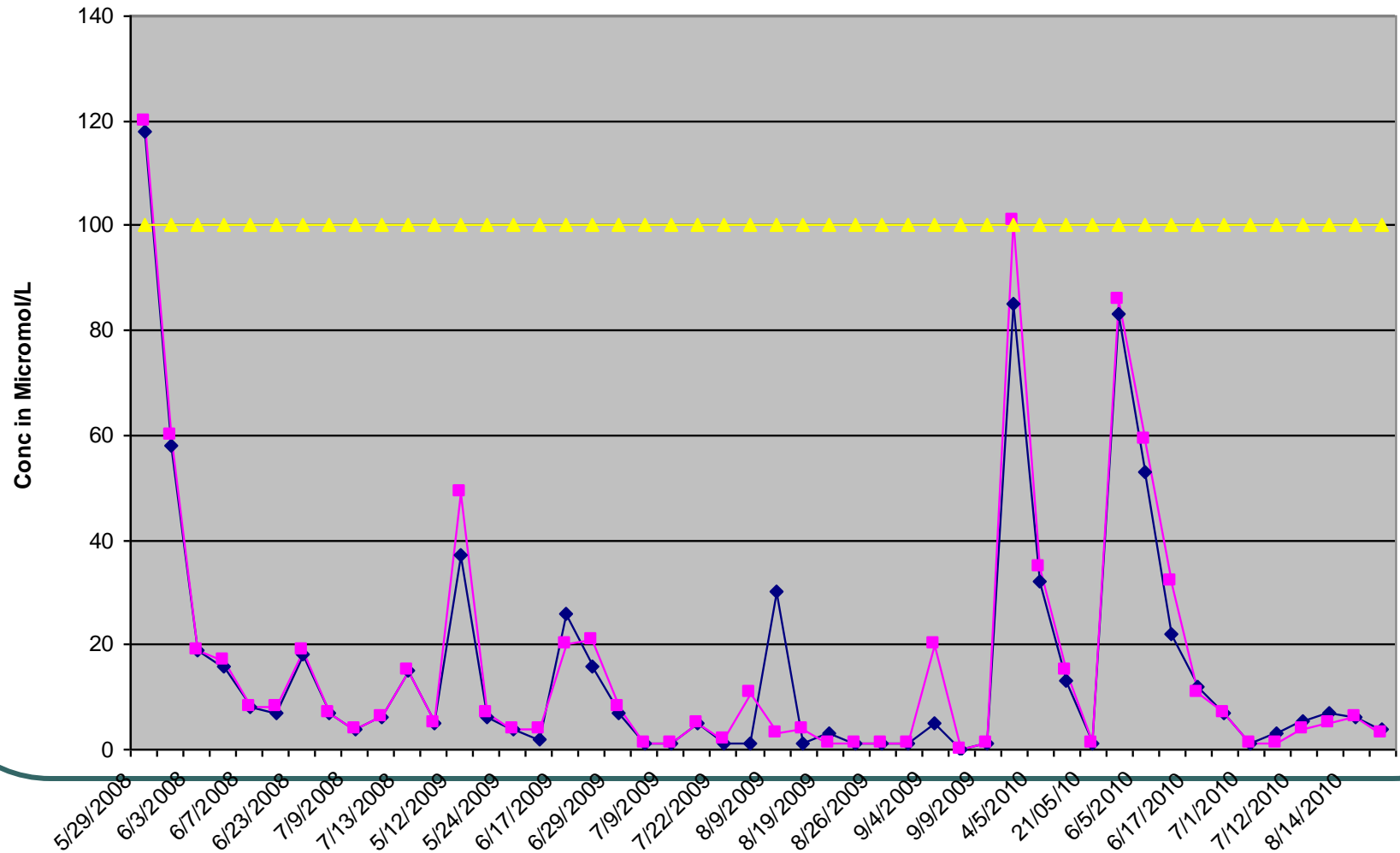
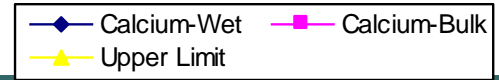


Sodium conc of Rain water (bulk and wet only collector) in $\mu\text{mol/L}$



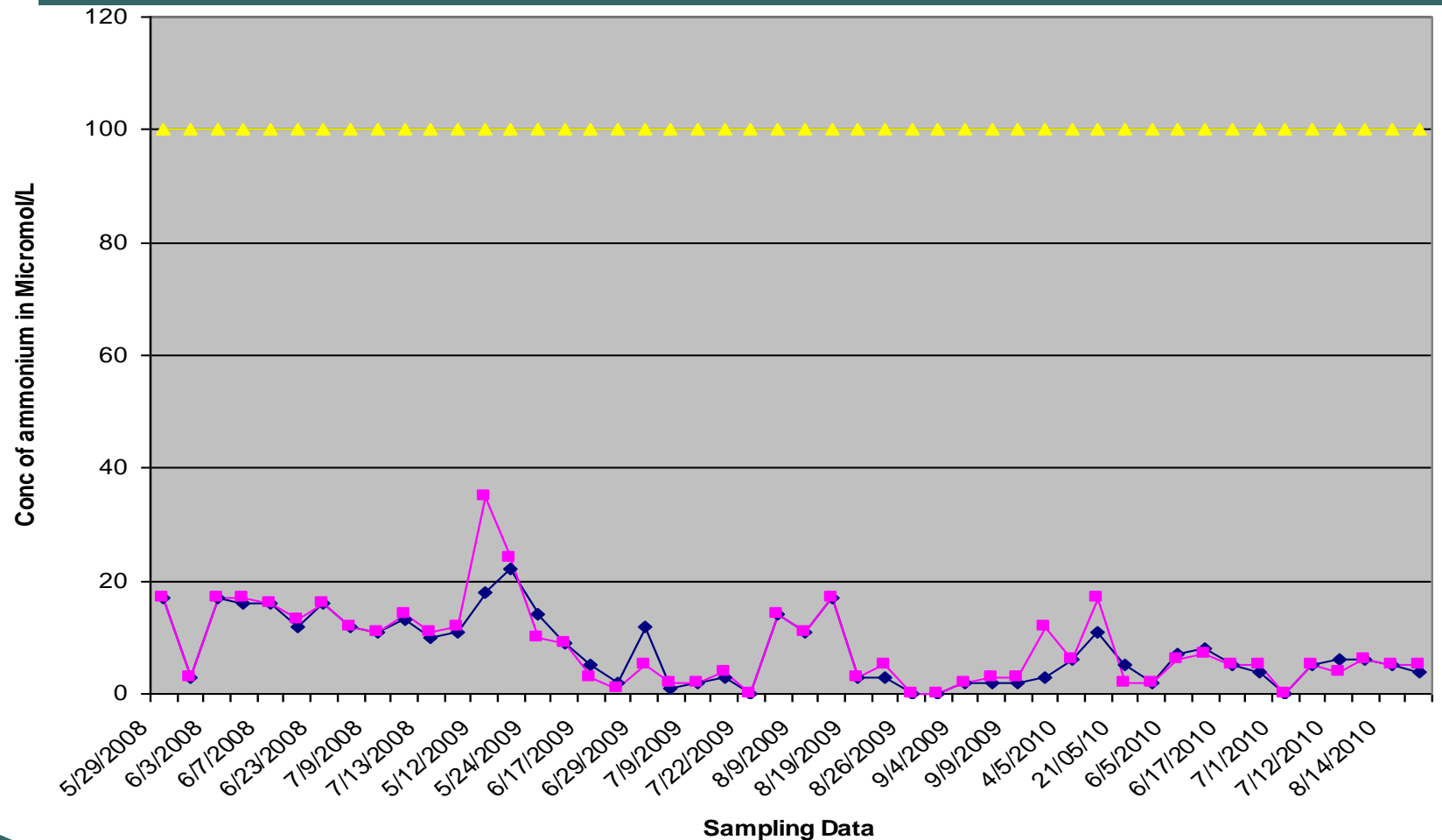
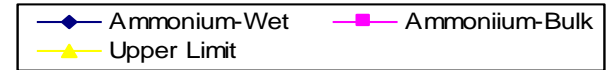
Calcium conc of Rain water (bulk and wet only collector) in $\mu\text{mol/L}$

Conc of Calcium ion in Rain water



Ammonium conc. of Rain water (bulk and wet only collector) in $\mu\text{mol/L}$

Conc of Ammonium ion in Rain water



Observation of Wet Deposition Monitoring

- The graphical data represent single sample of rain for both Bulk and wet only collectors.
- Initial one or two rain is shown higher minerals concentration than another rains of same year.
- Sodium and Chloride conc of rain water is shown higher than limit in several cases.

Needs

- Calibration of High Volume Sampler
- 5 digits Electric balance
- Replacement of Air Compressor for AAS
- Replacement of Hollow Cathode (Sodium, Calcium, Magnesium) for AAS
- Durable Lid and funnel of Wet Only Collector

Plan

- 2nd monitoring Stations
- To Include new parameter-PM_{2.5}
- Undertaking Corrosion Study
- Formulating Air Pollution Reduction Policy

Thank You