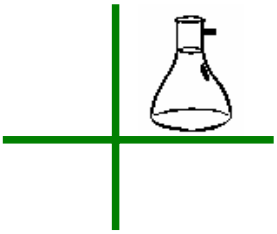

STUDY FOR QUANTIFYING SULPHATE AND NITRATE FORMATION OF AIR BORNE POLLUTANTS FROM COAL BASED POWER PLANT EMISSIONS.

Introduction:

- The major pollutants that cause acidic deposition are **sulfur dioxide** (SO_2) and **nitrogen oxides** (NO_x) produced during the **combustion** of **fossil fuels**. In the **atmosphere** these gases oxidize to sulfuric acid (H_2SO_4) and nitric acid (HNO_3) that can be transported long distances. Before being returned to the earth dissolved in rain drops (wet deposition), deposited on the surfaces of plants as cloud droplets, or directly on plant surfaces (**dry deposition**). Electrical utilities contribute 70% of SO_2 that are added to the atmosphere. Most of this is from the combustion of **coal**.
- A very significant portion of acid deposition occurs in the dry form.
- This material is deposited as sulfur dioxide gas and very finely divided particles (aerosols) directly on the surfaces of plants (needles and leaves). The rate of deposition depends not only on the concentration of acid materials suspended in the air, but on the nature and density of plant surfaces exposed to the atmosphere and the atmospheric conditions (e.g., wind speed and humidity).
- Acid deposition has the potential to adversely affect environment.
- Long-term exposure of acid sensitive materials used in building construction and in monuments (e.g., zinc, marble, limestone, and some sandstone) can result in surface corrosion and deterioration.
- Acidic deposition greatly accelerates the very slow depletion of soil nutrients due to natural **weathering** processes.
- The greatest concern for adverse effects of acidic deposition is the decline in biological productivity in lakes. When a lake has a pH less than 6.0, several **species** of minnows, as well as other species that are part of the food chain for many fish, cannot survive.

Methodology:

- To estimate the formation of Sulphate & Nitrate (H2SO4 & HNO3) through available data with the station and also by actual monitoring the stack emission, ambient air and meteorological condition at site on **specified** locations.
- Using the EPA approved modeling methodology (i.g. Industrial Source Complex Model version3 (ISC3) air dispersion model (EPA, 1995).
- Air Quality measurements to determine the spatial distribution of SO2, SO3, and NO3 emission.
- Surface water sampling to access potential contamination due to formation of H2SO4 and HNO3 at appropriate location of importance.

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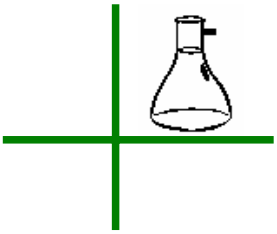

- For the measurement of various parameters USEPA methodology may be applicable.

Scope of Work:

1. Evolve monitoring plan for monitoring particulate, NO2, SO2, and CO2 etc. in air & emission.
2. Briefing and presentation on the proceedings for project prior to initiation of the job.
3. Execution of monitoring plan and Analyze the collected samples for Sulfate and Nitrate convertibility which contribute to the formation of acid rain (H2SO$/HNO3) using best available procedures.
4. Collection of data from continuous/periodical monitoring system.
5. Measurement of Air, Soil & Surface water quality for estimation of impact of acid rain.
6. Soft ware solution for estimation of SO4 and NO3 which resulted from the emission of the station ultimately contributing in formation of acid rain.
7. Preparation of draft report on the basis of findings.
8. Presentation of the project findings and relevant details to the station officials.
9. Submission of final report.

Findings:

- Quantifying the formation of SO4 and NO3 due to the operations of coal based power plant.
- Impact of estimated acid rain (H2SO4 & HNO3) on soil, water (surface/ground) and vegetation through sample survey.

Time: 15 months.

Estimated Cost: 8 Lac