

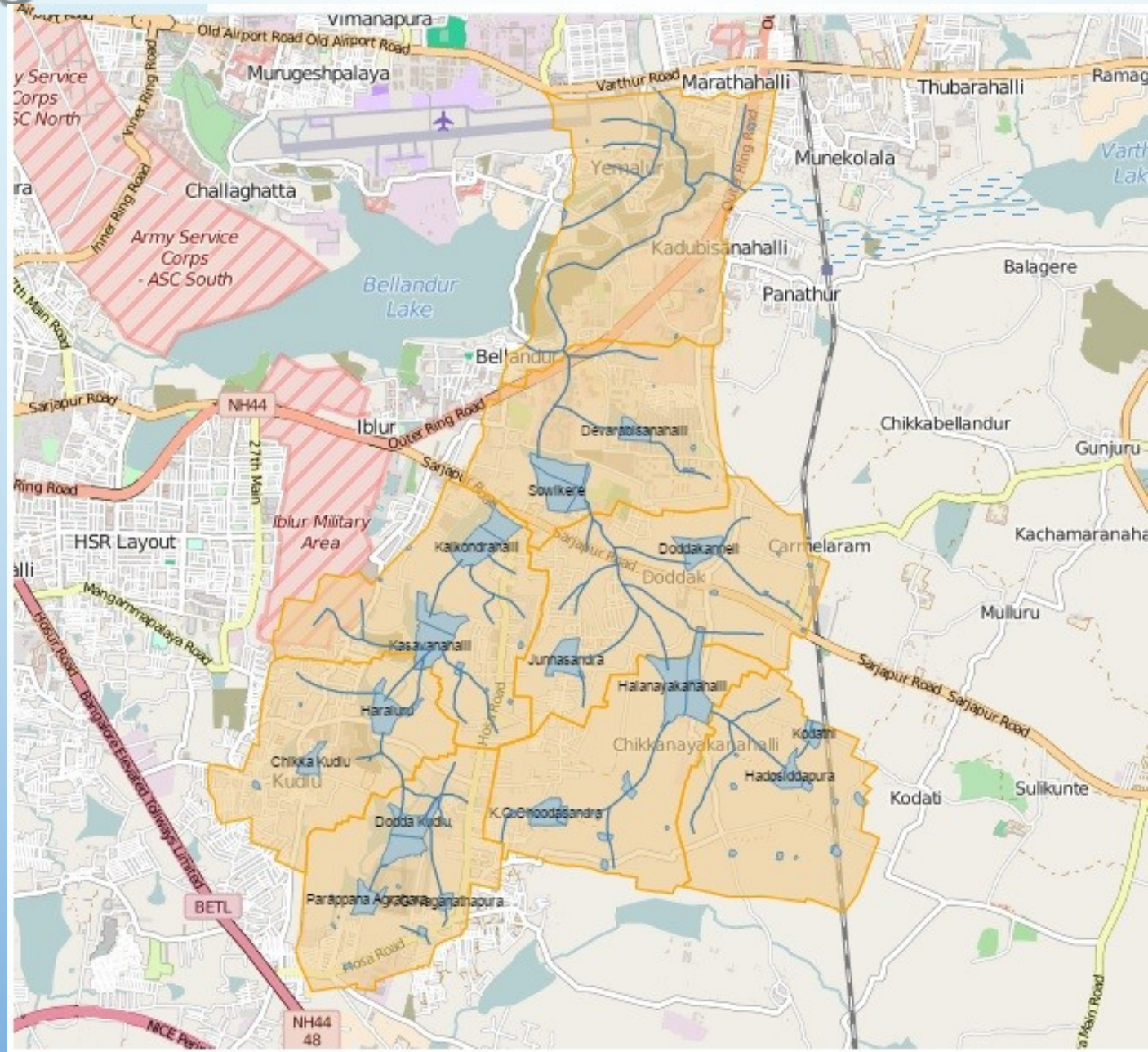
The background is a light blue gradient with several realistic water droplets of various sizes scattered across it. The droplets have highlights and shadows, giving them a three-dimensional appearance.

# YEMALUR WATERSHED VES STUDIES

BIOME ENVIRONMENTAL TRUST

1<sup>ST</sup> - 4<sup>TH</sup> FEBRUARY 2016

# STUDY AREA



## ***OBJECTIVE***

- THE VES OR RESISTIVITY SURVEY IS A NON-DESTRUCTIVE IN-SITU TEST
- CONDUCTED BY MEASURING VARIATIONS IN THE ELECTRICAL RESISTIVITY OF THE GROUND
- TO IDENTIFY GROUNDWATER YIELDING ZONES AND THEIR STRUCTURE
- THE DIRECTION OF GROUNDWATER MOVEMENT AND VARIATIONS IN QUALITY WITHIN THEM

## ***CRITERIA FOR SELECTION OF VES ARRAYS***

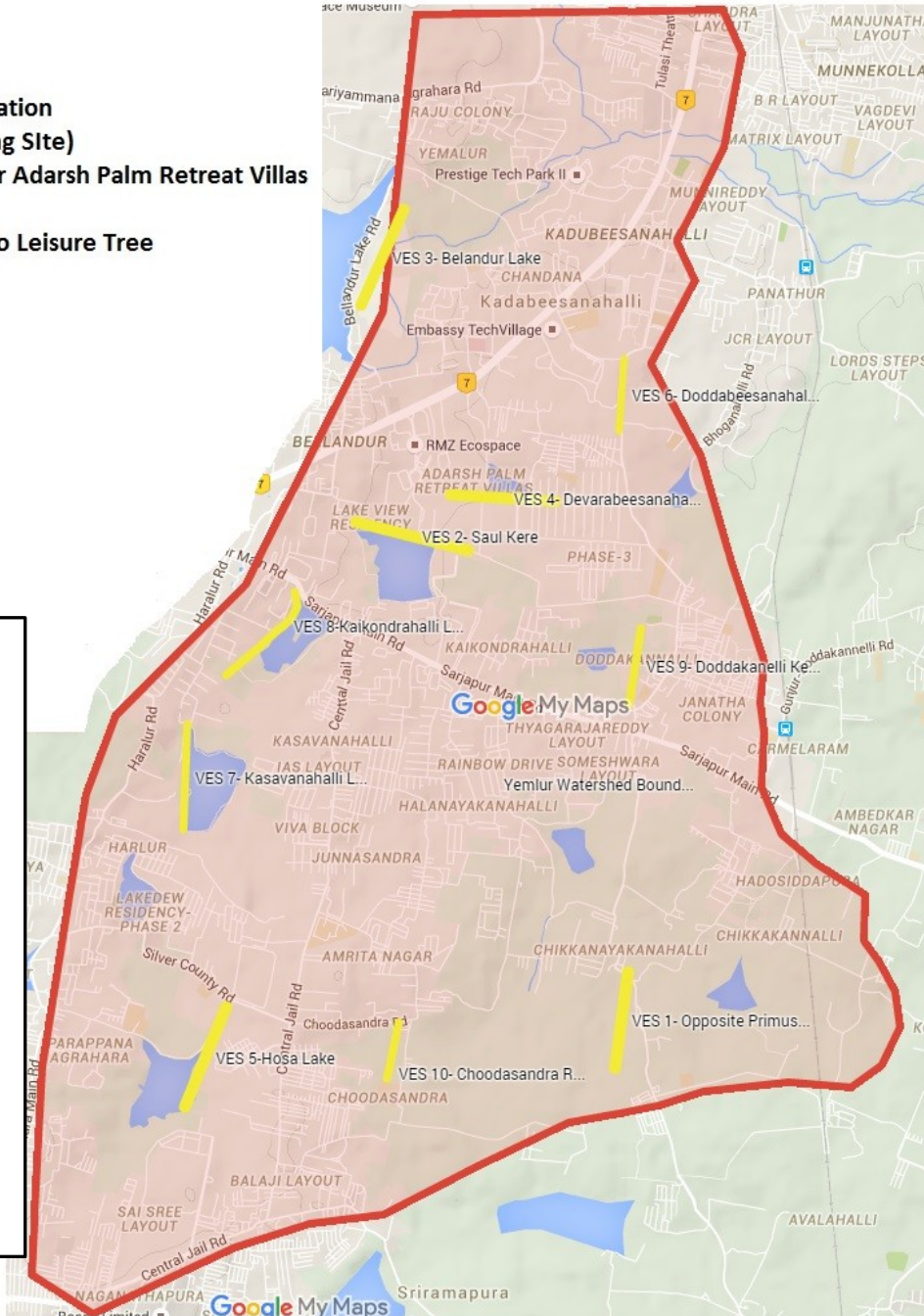
- ROUGHLY 700 M STRAIGHT STRETCH OF LAND
- PREFERABLY UNPAVED AND FREE FROM INTERSECTING POWER LINES
- COVERING ALL PARTS OF THE WATERSHED
- BALANCE OF N-S AND E-W ORIENTATION

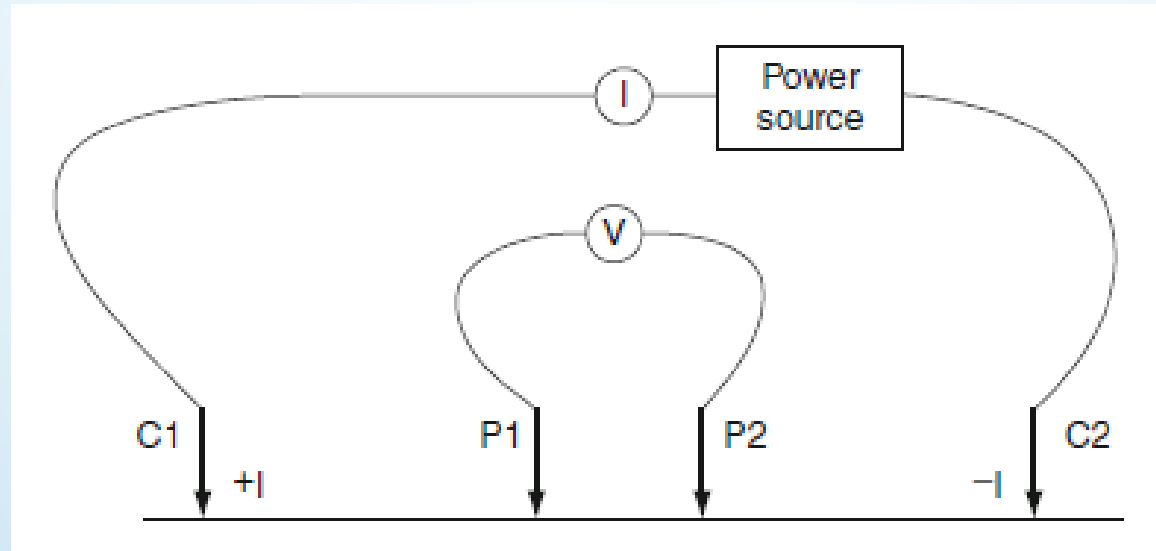
## VES ARRAYS

- VES 1- Opposite Primus School**
- VES 2- Saul Kere Roughly E-W orientation**
- VES 3- Belandur Lake (Inside Sterling Site)**
- VES 4- Devarabeesanahalli Lake Near Adarsh Palm Retreat Villas**
- VES 5-Hosa Lake.**
- VES 6- Doddabeesanahalli Rd close to Leisure Tree**
- VES 7- Kasavanahalli Lake**
- VES 8-Kaikondrahalli Lake**
- VES 9- Doddakanelli Kere**
- VES 10- Choodasandra Road**

The team identified TEN such locations along lake trails, cutting through properties which were under development at the time and alongside interior roads with less traffic.

The BBMP LAKE committees, Citizens groups and the developers were reached out to for necessary permissions.





## ***BASIC EXPERIMENTAL SETUP***

- A CURRENT IS PASSED INTO THE GROUND THROUGH TWO METAL STAKES (CURRENT ELECTRODES C1 AND C2)
- THE RESULTING VOLTAGE DIFFERENCE ON THE GROUND SURFACE IS MEASURED BETWEEN TWO OTHER POINTS (POTENTIAL ELECTRODES P1 AND P2).
- CURRENT (I) AND VOLTAGE (V) VALUES ARE USED TO CALCULATE THE APPARENT RESISTIVITY
- SUBSURFACE RESISTIVITY DISTRIBUTION IS MAPPED BY MAKING MEASUREMENTS WITH THE CURRENT AND VOLTAGE ELECTRODES AT DIFFERENT POSITIONS.

# ***MATERIALS***

- TESTING EQUIPMENT INCLUDING BATTERY
- TWO METAL RODS FOR MAKING PITS
- TWO HAMMERS
- TWO METAL STAKE TYPE OF ELECTRODES
- TWO CERAMIC POTENTIAL ELECTRODES
- ELECTRICAL WIRE AND TWINE
- WATER TO BE ADDED IN THE ELECTRODE PITS
- BUCKETS FOR WATER
- SALT IF LOW GALVANIC CONTACT IS ENCOUNTERED

## ***LABOUR REQUIREMENT***

- ONE PERSON TO MOVE AND HAMMER EACH CURRENT ELECTRODE
- ONE PERSON ALONG EACH LINE TO LAY OUT THE WIRE, PASS ON INSTRUCTIONS AND GUIDE THE PERSON CARRYING THE ELECTRODE
- ONE PERSON TO MOVE THE POTENTIAL ELECTRODES AND PASS ON INSTRUCTIONS FROM THE PERSON CONDUCTING THE EXPERIMENT
- TOTAL OF FIVE PERSONS FOR A DURATION OF 4 DAYS
- 2 MEMBERS FROM BIOME WERE ALSO PRESENT TO PROVIDE ADDITIONAL SUPPORT



# ***STUDY DURATION AND BUDGET***

- 2-3 ARRAYS EACH DAY, STUDY COMPLETED OVER 4 DAYS FROM FEB 1<sup>ST</sup> TO FEB 4<sup>TH</sup>
- THE FOLLOWING ITEMS WERE BUDGETED FOR
  - LABOUR CHARGES INCLUDING MEALS @ 500 PER PERSON PER DAY
  - CAB FOR TRANSPORT OF LABOUR AND MATERIALS @ 3000 PER DAY
  - VEHICLE FOR TEAM @ 500 PER DAY
  - HYDROGEOLOGIST CHARGES
  - NEARBY HOTEL ACCOMMODATION FOR HYDROGEOLOGIST
  - MEALS FOR THE TEAM
  - WATER AND SALT AS REQUIRED

