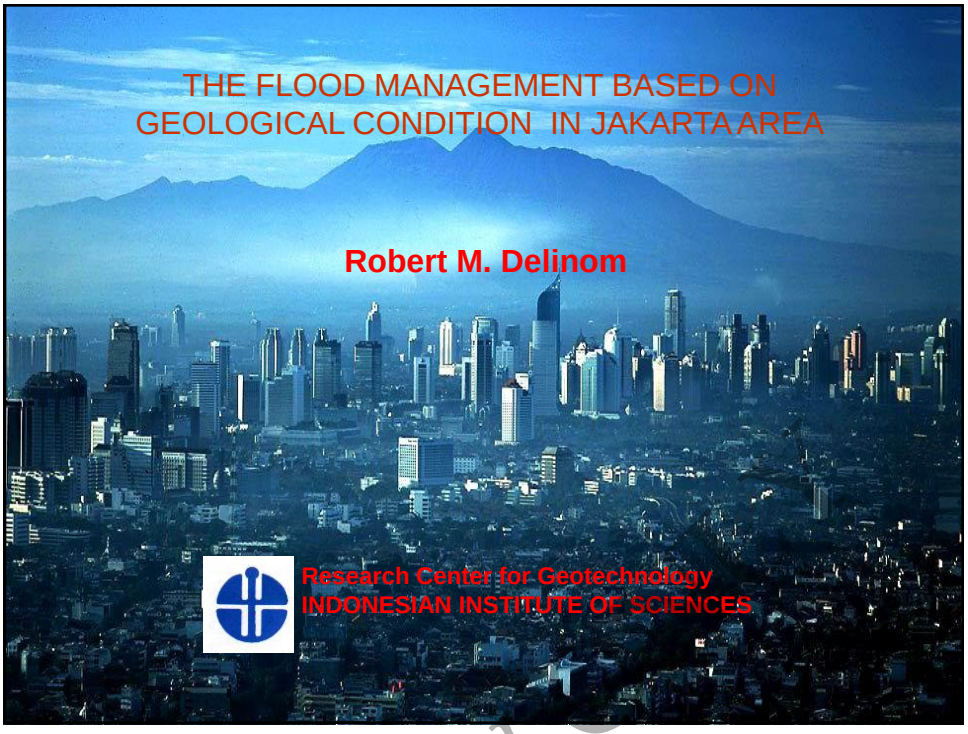
THE FLOOD MANAGEMENT BASED ON
GEOLOGICAL CONDITION IN JAKARTA AREA
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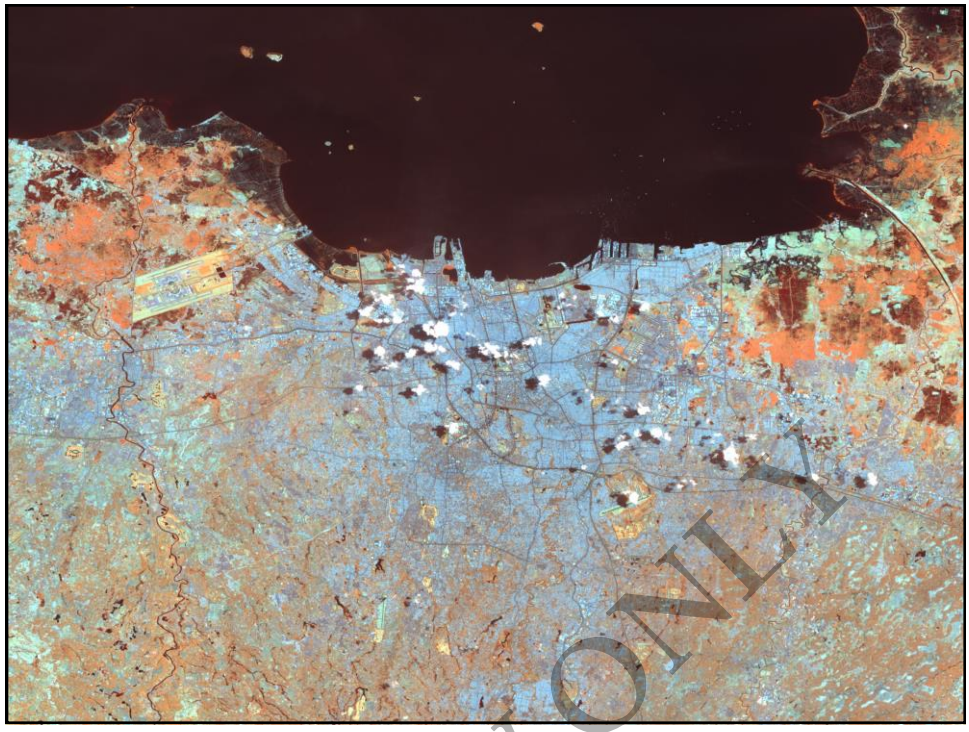
INDONESIAN INSTITUTE OF SCIENCES

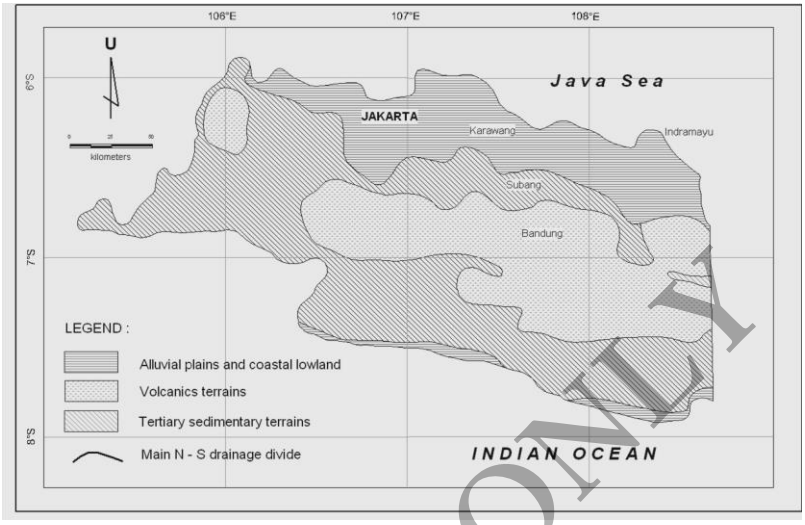

JAVA SEA
SUNDA STRAIT
Serang
Anyer
JAKARTA
Bekasi
Karawang
Tangerang
Indramayu
Pandeglang
Cibinong
ANAITAN IS.
Bogor
Jatiluhur
Dam
Ujungkulon
National Park
Wildlife
Husein Sastranegara
Airport
Cirebon
Baduy
Village
Mt.
Pangrango
Mt.
Ceremay
BANDUNG
Pelabuhan Ratu
Cianjur
Sukabumi
Kuningan
Mt. Malabar
Garut
Mt. Guntur
Tasikmalaya
CENTRAL
JAVA
INDIAN OCEAN
Sindangbarang
Pangandaran
WEST JAVA
JAVA

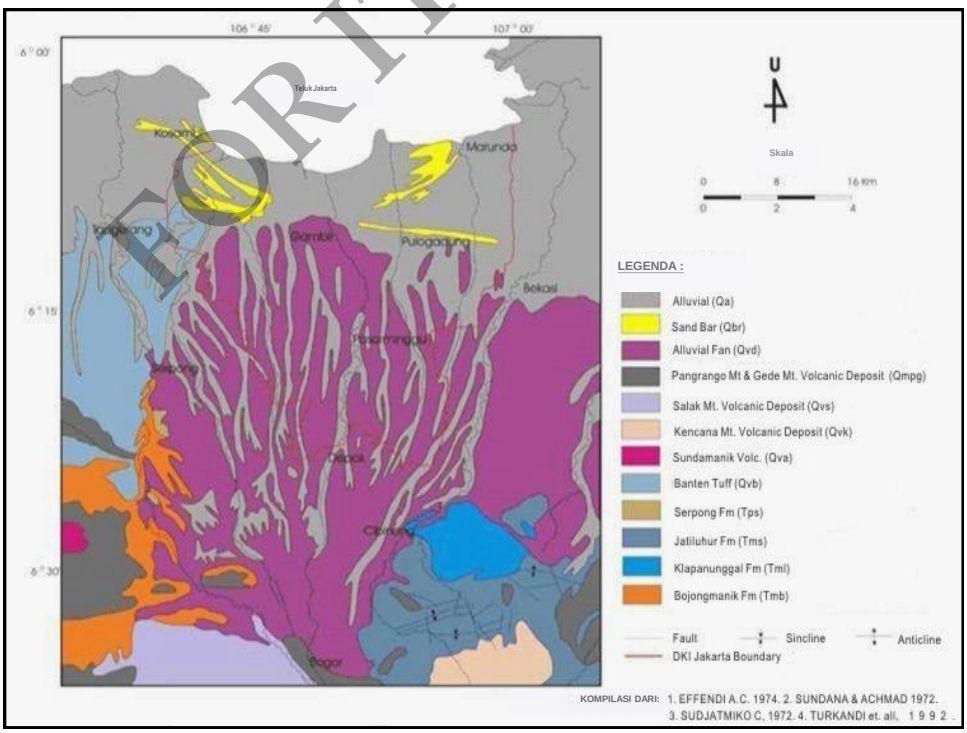


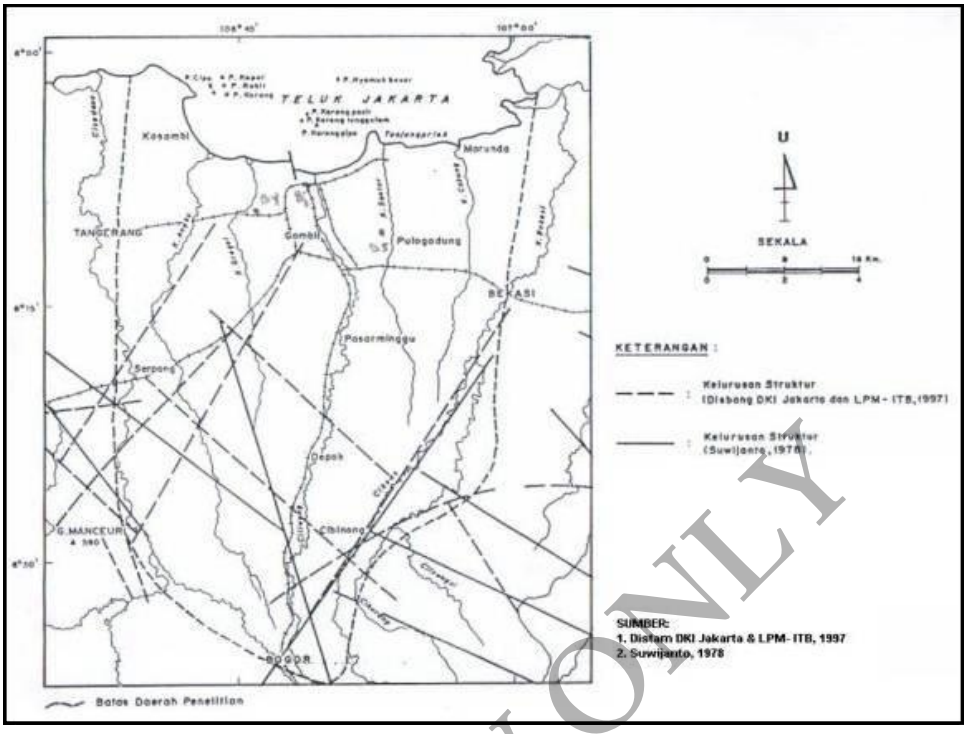
INTRODUCTION

- Around 10 millions inhabitants live in Jakarta Area. (During Office Hour around 12 millions)
- Located in the coastal lowland
- 13 rivers flow inside this area
- Floods in Jakarta were recognize since long time ago (Dutch Occupation Era)
- Enormous Flood occurred on year 1621, 1654, and 1918
- The last two floods Occurred on 1976,1996, 2002, and 2007
- General causal factors: excessive rainfall, landused change and uncontrolled city develoment
- The Geological Factor?

Three major geological terranes on West Java (After Engelen and Kloosterman, 1996)

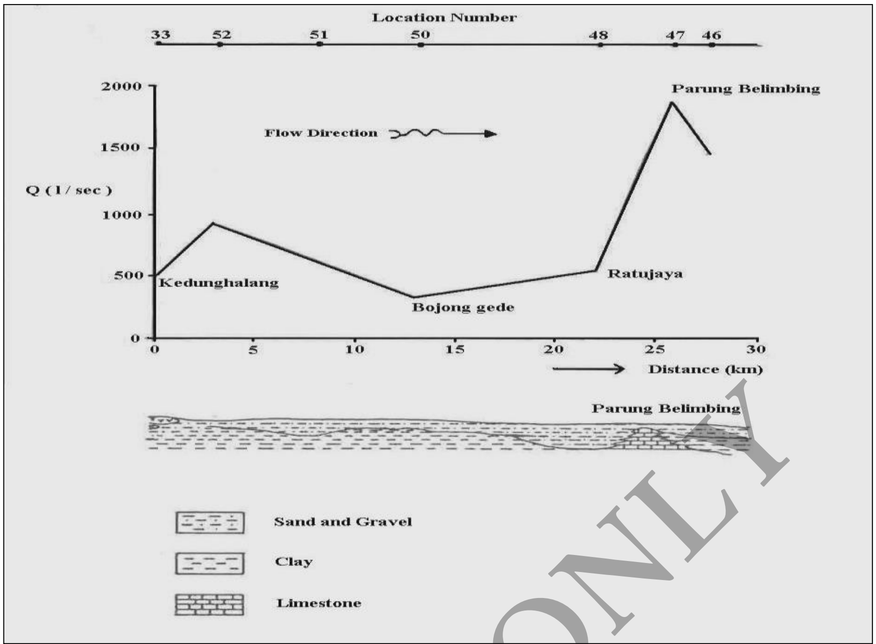




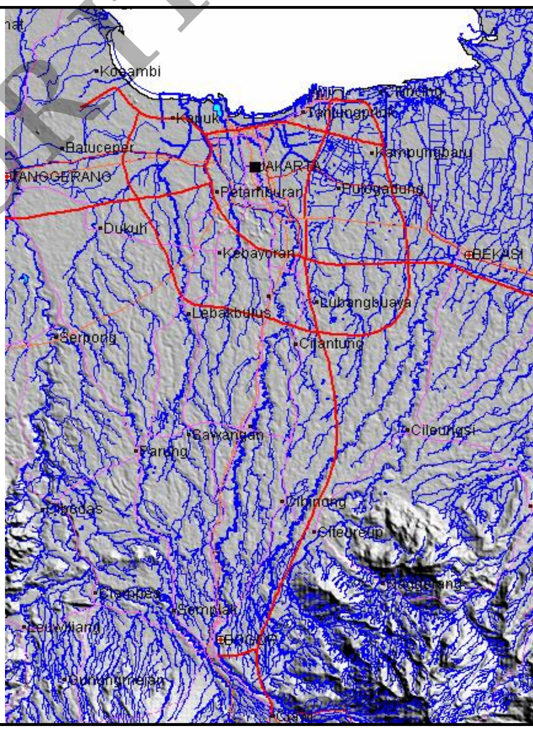


JAKARTA LITHOLOGY CHARACTERISTIC

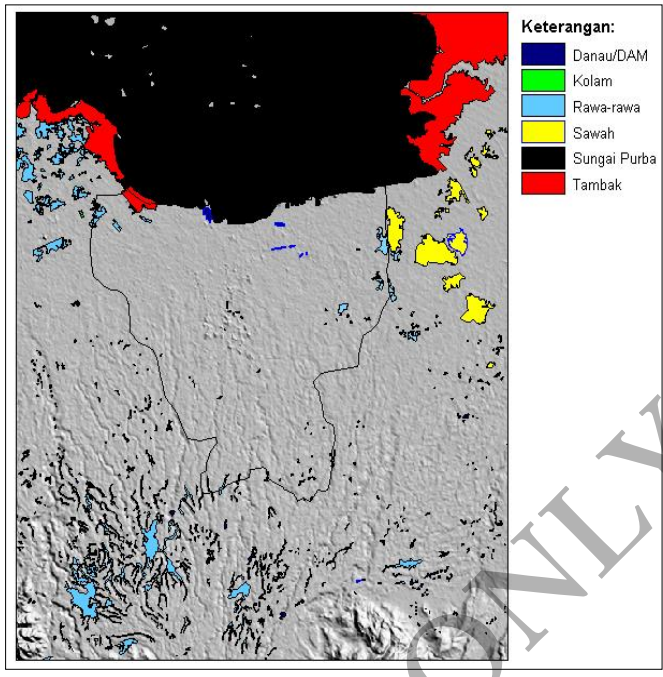
- Genetically, formed in fluviatile, fluvio-marine, fluvio-volcanic or shallow marine environment
- As an area with volcanic chain in the hinterland area, it is mostly formed by fluviatile and fluvio-volcanic sediment
- Groundwater over production can cause water quality decline
- High porosity
- Some aquifer found as a lens in beach ridge



Location Number
33
52
51
50
48
47
46
2000
1500
1000
500
0
Q (1 / sec)
Flow Direction
Parung Belimbing
Kedunghalang
Bojong gede
Ratujaya
0
5
10
15
20
25
30
Distance (km)
Parung Belimbing
Sand and Gravel
Clay
Limestone



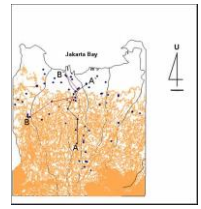
Kapuk
Batuceper
TANGGERANG
JAKARTA
Petamburan
Pulogadung
Kampungbaru
Dukuh
Kebayoran
BEKASI
Lebakbulus
Lubangbuaya
Serpong
Cijantung
Sawangan
Parung
Cileungsi
Cibinong
Citeureup
Semplak
BOGOR

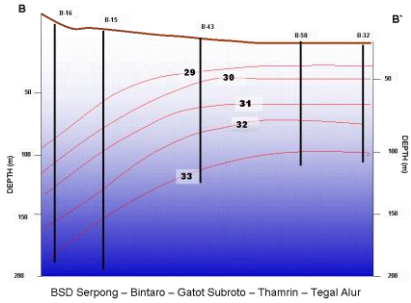


- A detail observation in geological properties
- Borehole temperature measurement
- Objectives :

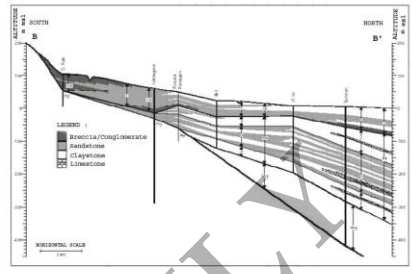
  - identify the Jakarta Basin recharge Area
  - control of geological condition to the groundwater flow of this basin

Subsurface temperature distribution in the cross section of B – B'



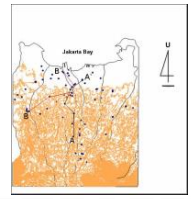


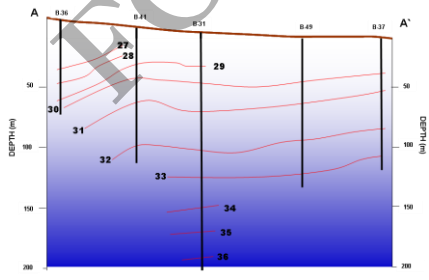
BSD Serpong – Bintaro – Gatot Subroto – Thamrin – Tegal Alur



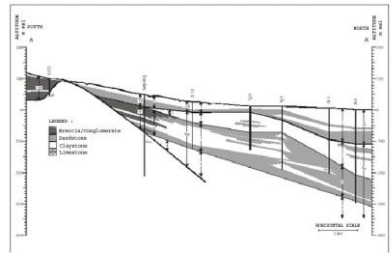
Cross section B-B` showing convective heat flow distribution along the primary groundwater-flow path as well as it`s reflection in the geological cross section

Subsurface temperature distribution in the cross section of A – A'

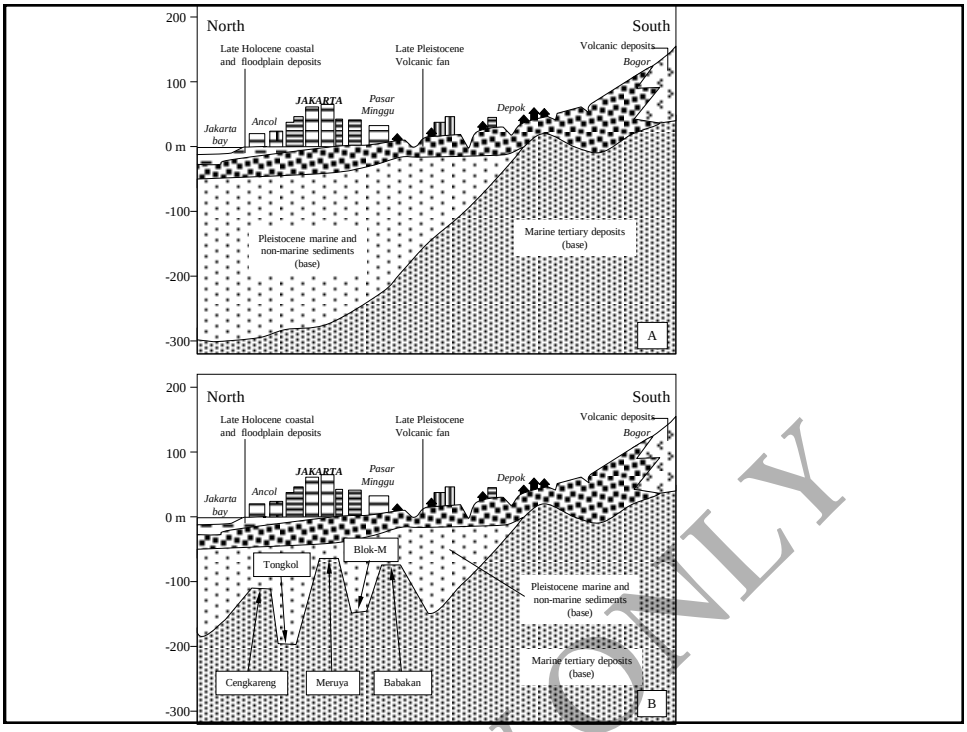


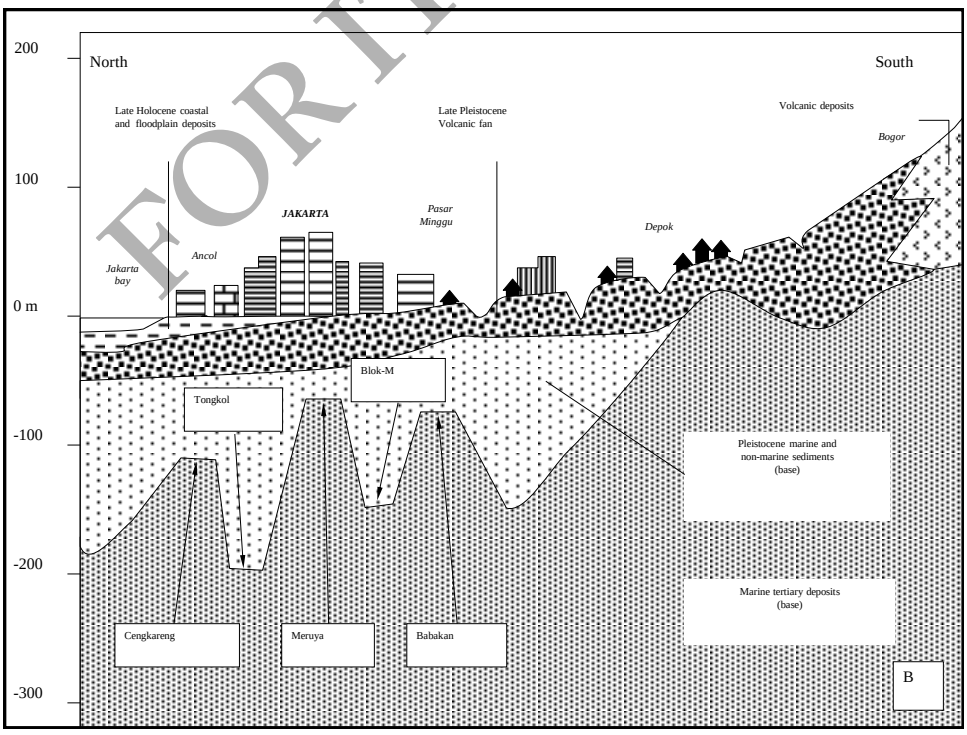


Ades – Malaktek Bogor – Pasar Minggu – Kebon Sirih - Sunter

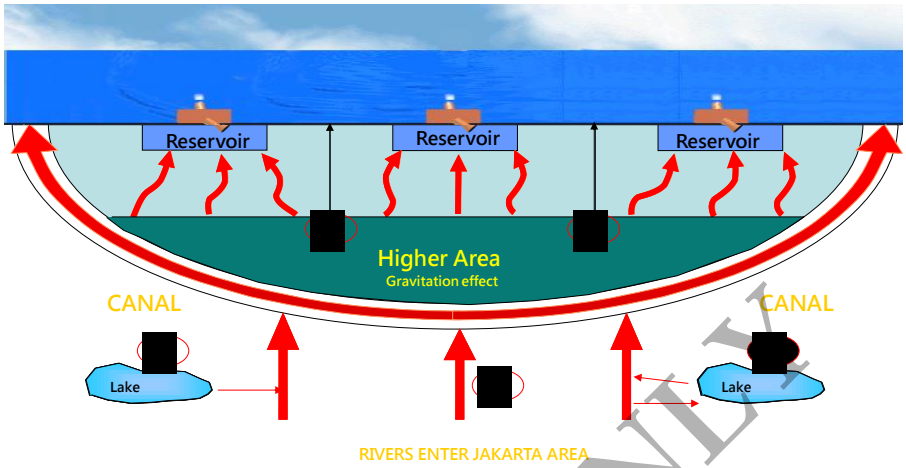


Cross section showing some local pattern that can be identified as a local recharge. Compare to the geological cross section it`s reflection some Limestone Formation (Depok High) that controlled the groundwater flow. This difference presumably reflects a shallow thermal regime.


200
100
0 m
-100
-200
-300
North
South
Late Holocene coastal and floodplain deposits
Late Pleistocene Volcanic fan
Volcanic deposits
Bogor
JAKARTA
Pasar Minggu
Depok
Ancol
Jakarta bay
Pleistocene marine and non-marine sediments (base)
Marine tertiary deposits (base)
A
Tongkol
Blok-M
Cengkareng
Meruya
Babakan
B


200
100
0 m
-100
-200
-300
North
South
Late Holocene coastal and floodplain deposits
Late Pleistocene Volcanic fan
Volcanic deposits
Bogor
JAKARTA
Pasar Minggu
Depok
Ancol
Jakarta bay
Tongkol
Blok-M
Pleistocene marine and non-marine sediments (base)
Marine tertiary deposits (base)
Cengkareng
Meruya
Babakan
B

FLOOD MANAGEMENT PLAN OF JAKARTA AREA



CONCLUSION

The geological condition in Jakarta Basin should be considered as one important factor in analyzing the Jakarta Flooding .