1 GROUND WATER PROSPECTS MAP

2 (PREPARED FROM SATELLITE IMAGE INTERPRETATION WITH LIMITED FIELD CHECKS)

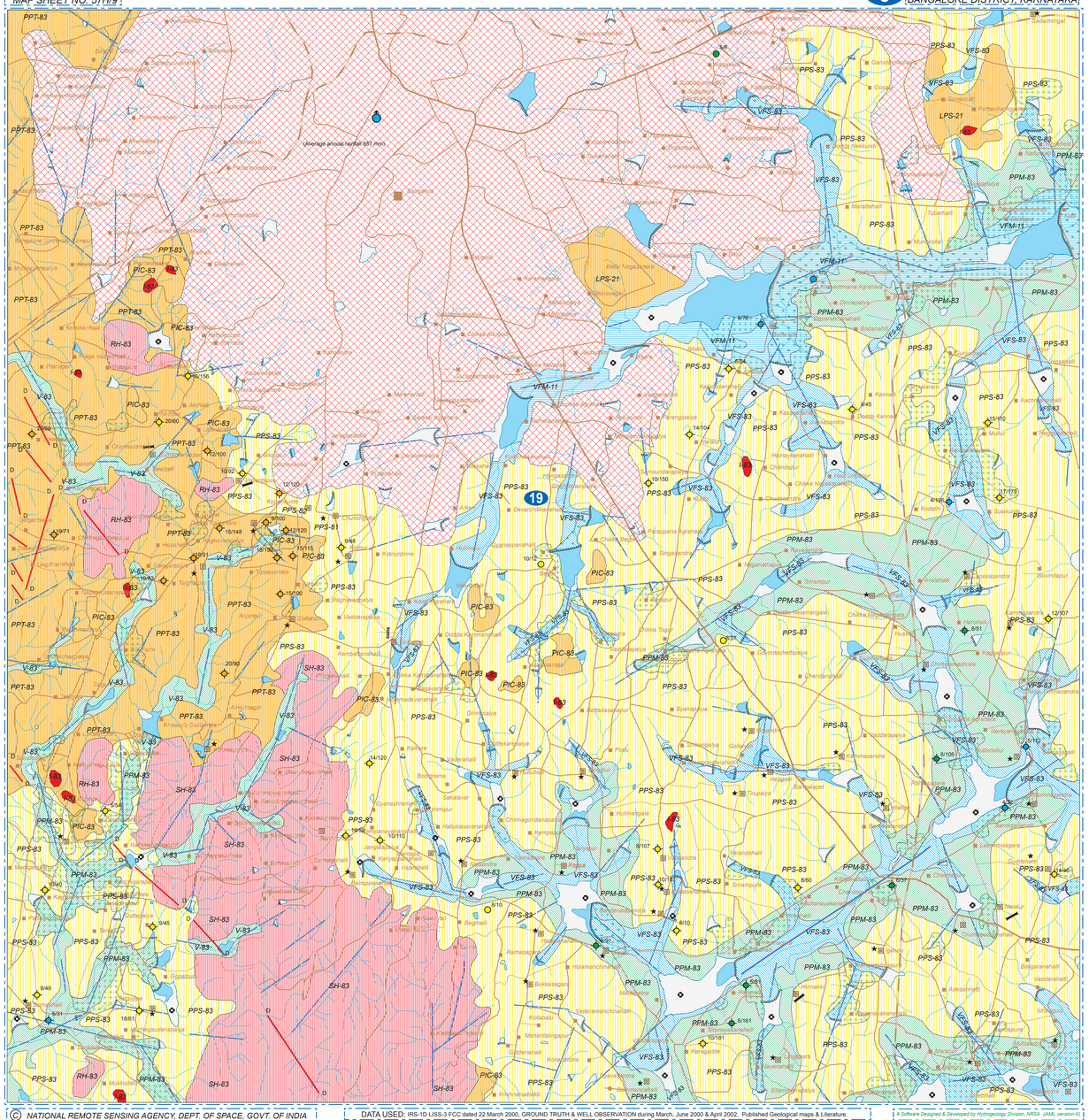
3 1 0 1 2 3 4 5 Kilometers

SCALE - 1:50,000

6 N W E S

4 MAP SHEET NO. 57H/9

5 BANGALORE DISTRICT, KARNATAKA



7

DATA USED: IRS-1D LISS-3 FCC dated 22 March 2000, GROUND TRUTH & WELL OBSERVATION during March, June 2000 & April 2002. Published Geological maps & Literature.

8

Software Designed & Developed by Hydrogeology Division, NRSA (AMI, version-II)

9

20 L E G E N D

MAP UNIT (HYDROGEOMORPHIC UNIT) — REPRESENTED IN THE MAP WITH ALPHANUMERIC CODE (COLOUR INDICATES GROUND WATER PROSPECTS)		GEOLOGICAL SEQUENCE/ ROCK TYPE (REPRESENTED IN THE MAP WITH NUMERIC CODE)	GEOMORPHIC UNIT/LANDFORM (REPRESENTED IN THE MAP WITH ALPHABETIC CODE)	DEPTH TO WATER LEVEL (SUMMER/PRE-MONSOON (AVERAGE IN METERS)) NO. OF WELLS OBSERVED	RECHARGE CONDITIONS (BASED ON AVAILABILITY OF WATER (RAINFALL & OTHER SOURCES))	GROUND WATER PROSPECTS: AQUIFER MATERIAL (LS= LOOSE SEDIMENTS; PR= PERMEABLE ROCK; FIR= FISSURED ROCK; FR= FRACTURED ROCK; WR= WEATHERED ROCK; IR = IMPERVIOUS ROCK)	TYPE OF WELLS SUITABLE (DW = DUG WELL; BW = RING WELL; BW = BORE WELL; TW = TUBE WELL; DBW = DUG-CUM-BORE / TUBE WELL; DTW)	DEPTH RANGE OF WELLS (SUGGESTED) MIN - MAX (IN METRES)	YIELD RANGE OF WELLS (EXPECTED) (in LPM or m³/day)	HOMOGENEITY IN THE UNIT & SUCCESS RATE OF WELLS (PROBABILITY) VERY HIGH HIGH MODERATE LOW	QUALITY OF WATER POTABLE (P) NON-POTABLE (NP) (INDICATE REASONS IF NON POTABLE)	GROUND WATER IRRIGATED AREA (APPROX . RANGE IN PERCENTAGE)	RECHARGE STRUCTURES SUITABLE & PRIORITY PT = PERCOLATION TANK; CD = CHECK DAM; NB = NALA BUND; RW = RECHARGE WELL; DT = DESILTING OF TANK; RP = RECHARGE PIT	REMARKS (PROBLEMS / LIMITATIONS)
VFM-11	RECENT	ALLUVIUM -SAND & SILT DOMINANT (11)	VALLE YFILL-MODERATE (VFM) (12-15 m)	2-6 m DW-1 BW-1	VERY GOOD	LS+WR+FIR	DW BW	6-10 m 25-30 m	150-175 cu.m/day 300-400 lpm	High High	P	15-20	DT High Priority	It occurs in southern part over lesser extent. Unconsolidated sediments and weathered gneiss form good aquifer. High potential zone due to recharge from tank and tank irrigated areas. Suitable for further development. Desiltation on high priority due to large accumulation of sand.
LPS-21	QUATERNARY	LATERITE (21)	LATERITE PLAIN-SHALLOW (LPS) (6-9 m)	NO WELLS OBSERVED	LIMITED	WR+FIR	BW	80-100 m	30-40 lpm	Low	P	Nil	RP Moderate Priority	More run-off as this zone forms topographic high. Exploitation is minimal as plantations of eucalyptus and casurina have been developed.Very few habitations. Not suitable for ground water development.
PPS-81	PENINSULAR GNEISSIC COMPLEX (ARCHAEAN)	GRANITE (81)	PEDIPLAIN-SHALLOW (PPS) (6-8 m)	10-18 m BW-1	MODERATE	WR+FIR	BW	80-100 m	75-100 lpm	Moderate	P	5-10	RP/PT Moderate Priority	Weathered and fissured granite form aquifer. More run-off as it forms topographic high.Better prospects in the vicinity of PPM and VFS.
PPS-82		MIGMATITE (82)	PEDIPLAIN-SHALLOW (PPS) (6-8 m)	10-18 m BW-1	MODERATE	WR+FIR	BW	80-100 m	75-100 lpm	Moderate	P	5-10	RP/PT Moderate Priority	Weathered and fissured migmatite form aquifer. More run-off as it forms topographic high.Better prospects in the vicinity of PPM and VFS.
VFS-83		BANDED BIOTITE GNEISS & HORNBLENDE GNEISS (83)	VALLEY FILL-SHALLOW (VFS) (8-10 m)	2-6 m BW-4	GOOD	LS+WR+FIR	DW BW	10-12 m 60-80 m	100-150 cu.m/day 200-300 lpm	Moderate Moderate	P	20-30	DT High Priority	Loose sediments and weathered gneiss form aquifer.Potential zone due to recharge from tanks and tank irrigated areas.Desiltation on high priority due to large accumulation of sand and silt. Suitable for ground water development.
PPM-83			PEDIPLAIN-MODERATE (PPM) (10-12 m)	5-8 m BW-6	GOOD	WR+FIR	DW BW	12-15 m 60-80 m	75-100 cu.m/day 150-200 lpm	Moderate Moderate	P	20-25	RP/PT Moderate Priority	Weathered and fissured gneiss form aquifer.Moderately good potential zone as it lies adjacent to VFM and VFS. Suitable for ground water development.
PPS-83			PEDIPLAIN-SHALLOW (PPS) (6-8 m)	10-18 m DW-4 BW-21	MODERATE	WR+FIR	BW	80-100 m	75-100 lpm	Moderate	P	5-10	RP/PT Moderate Priority	Weathered and fissured gneiss form aquifer.More run-off as it forms topographic high.Better prospects in the vicinity of PPM and VFS.
V-83			VALLEY (V)	NO WELLS OBSERVED	GOOD	WR+FR	DW BW	12-15 m 60-80 m	75-100 cu.m/day 150-200 lpm	Moderate Moderate	P	Negligible	Not Riquired	Weathered and fissured gneiss form aquifer. Very good prospects as it recieves run-off water from other units. Lineament zones form high potential zones.
PPT-83			PEDIPLAIN-DISSECTED (PPT)	15-20 m BW-14	LIMITED	WR+FIR	BW	90-110 m	20-30 lpm	Low	P	Negligible	RP/PT Low Priority	Weathered and fissured gneiss form aquifer.Considerable run-off due to dissection,relief,slope and rock out crops.Better prospects in valley portions.
PIC-83			PEDIMENT-INSELBERG COMPLEX (PIC)	NO WELLS OBSERVED	POOR	WR+FIR	BW	90-110 m	15-25 lpm	Low	P	Nil	Not Required	Weathered and fissured gneiss form aquifer.More run-off due to frequent rock out crops.Prospects limited to areas free of rock out crops. Prospects inferred based on PPT-83. Not suitable for ground water development. No habitations.
I-83			INSELBERG (I)	———	———	———	———	———	———	———	———	———	———	Run off-zone; Not suitable for ground water development.
RH-83			RESIDUAL HILL (RH)	———	———	———	———	———	———	———	———	———	———	Mainly run off-zone; Prospects limited to valey portions only.
SH-83			STRUCTURAL HILL (SH)	———	———	———	———	———	———	———	———	———	———	Mainly run off-zone; Prospects limited to valey portions only.

F——F / ——— / — — These are fault / fracture zones, which generally act as conduits for movement of ground water in hard rocks. Along these zones, the yields are significantly higher and wells are likely to be sustainable for longer duration. However, the inferred fractures need to be confirmed by detailed ground surveys.

These are the dykes, quartz reefs, pegmatites etc. which generally act as barriers for ground water movement.

N.B. - The depth range and yield range of wells may vary within the unit because of certain inhomogeneities. Fractures / lineaments which are clearly observed / inferred from the satellite image are indicated on the map. There could be some obscured fractures which also influence the ground water prospects. Locations of the recharge structures shown in the map are tentative. This map is useful for narrowing down the target zones, and exact locations on the ground for wells and recharge structures should be identified based on follow-up ground hydrogeological / geophysical surveys.

BANGALORE CITY

16 C O M M O N M A P I N D E X 17

15 GROUND WATER PROSPECTS INFORMATION

YIELD RANGE OF WELLS	COLOUR CODE	DEPTH RANGE OF WELLS: SHALLOW < 30 METERS	MODERATE 30-80 METERS	DEEP > 80 METERS
> 800 LPM	Violet			
400-800 LPM	Indigo			
200-400 LPM	Blue			
100-200 LPM	Green			
50-100 LPM	Yellow			
10-50 LPM	Orange			
Prospects limited to valley portions only (Hills, Plateaus etc.)	Red			
Run-off zone/ Barrier for G.W. movement		(Inselberg / Ridge / Dyke etc.)		

HYDROLOGICAL INFORMATION

DESCRIPTION	SYMBOL
CANAL/TANK IRRIGATED AREA	
GROUND WATER IRRIGATED AREA	
RAIN GUAGE STATION (With average annual rainfall in mm)	600

RECHARGE STRUCTURES SUGGESTED

PERCOLATION TANK; CHECK DAM; NALA BUND; RECHARGE WELL; DESILTING OF TANK; RECHARGE PIT

WELLS OBSERVED DURING FIELD VISIT

YIELD RANGE IN LPM	BORE / TUBE WELL	YIELD RANGE IN m³/day	DUG WELL/ RING WELL
> 800 LPM	>570	> 400 m³/day	8/15
400-800 LPM	>570	200-400 m³/day	8/15
200-400 LPM	>570	100-200 m³/day	8/15
100-200 LPM	>570	50-100 m³/day	8/15
50-100 LPM	>570	25-50 m³/day	8/15
10-50 LPM	>570	5-25 m³/day	8/15
< 10 LPM	>570	< 5 m³/day	8/15

Colour inside well symbol indicates yield range. The figures on the top right hand side of well indicate the depth to water level and total depth of well in meters.

DUG-CUM-BORE WELL; HAND PUMP WELL; ARTESIAN WELL; OBSERVATION WELL OF G.W.DEPT. / C.G.W.B.

STRUCTURAL INFORMATION

DIPS	BEDDING	SCHISTOSITY/ FOLIATION
GENTLE (< 15°)		
MODERATE (15°-45°)		
STEEP (45°-80°)		
SUB-VERTICAL TO VERTICAL (> 80°)		

ANTICLINE / ANTIFORM; SYNCLINE / SYNFORM; TREND LINE; ESCARPMENT; LITHOLOGIC / GEOMORPHIC UNIT BOUNDARY

	MINOR	MAJOR
FAULT	f	F
FRACTURE / LINEAMENT		
FRACTURE / LINEAMENT (Unferred)		

DYKE (Confirmed / Inferred); QUARTZ REEF (Confirmed / Inferred); PEGMATITE (Confirmed / Inferred)

(Lithologic contacts are inferred at places & Geomorphic boundaries are gradational)

18 BASE MAP INFORMATION

SYMBOL	DESCRIPTION
	RIVER / STREAM
	WATER BODY / SPRING
	CANAL
NH-7	NATIONAL HIGHWAY
SH-9	STATE HIGHWAY
	METALLED ROAD
	OTHER ROAD
	RAILWAY
	CITY / VILLAGE
	HABITATIONS: NOT-COVERED (NC)/ PARTIALY COVERED (PC)
	BOUNDARY : STATE
	DISTRICT

OTHER INFORMATION

Average annual rainfall is 857 mm.

21 LOCATION INFORMATION

MAPSHEET INDEX

57G/8	57G/12	57G/16
57H/5	57H/9	57H/13
57H/6	57H/10	57H/14

ADMINISTRATIVE INDEX

BANGALORE

10 PREPARED BY
TECHNOLOGY INFORMATICS DESIGN ENDEAVOUR
#19, 9 TH CROSS, 6 TH MAIN,
MALLESWARAM,BANGLORE - 560 003

11 TECHNICAL GUIDANCE & QUALITY CHECK
NATIONAL REMOTE SENSING AGENCY
DEPT. OF SPACE, GOVT OF INDIA
BALANAGAR
HYDERABAD-37

12 PARTICIPATING ORGANISATIONS
1) P.H.E Dept, Govt. of Karnataka
2) G.W. Dept, Govt. of Karnataka
3) Karnataka State Remote Sensing centre
4) Central Ground Water Board

13 METHODOLOGY & PROJECT EXECUTION
NATIONAL REMOTE SENSING AGENCY
DEPT. OF SPACE, GOVT. OF INDIA
BALANAGAR, HYDERABAD

14 SPONSORED BY
RAJIV GANDHI NATIONAL DRINKING WATER MISSION
MINISTRY OF RURAL DEVELOPMENT
GOVT. OF INDIA, NEW DELHI