GROUND WATER PROSPECTS MAP

(PREPARED FROM SATELLITE IMAGE INTERPRETATION WITH LIMITED FIELD CHECKS)

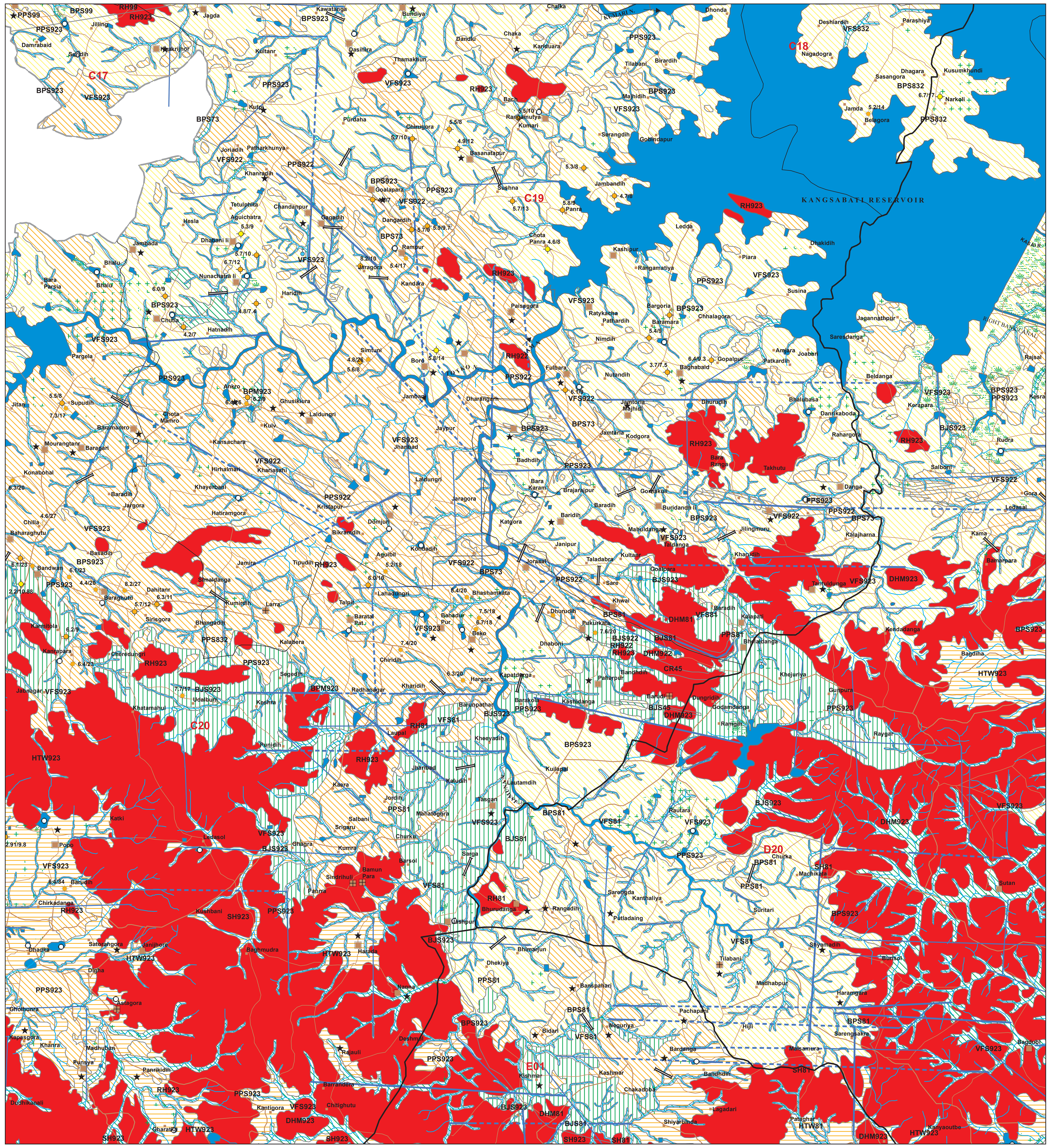
Kilometers
0 1 2 3 4 5

SCALE - 1 : 50,000

N W E S

MAP SHEET NO. 73J/9

PURULIYA,BANKURA AND PASCHIM MEDINIPUR DISTRICTS, WEST BENGAL



DATA USED : IRS - P6 LISS III FCC dated February 2006, GROUND TRUTH & WELL OBSERVATION during April-May, 2009 & Jan-Feb, 2010, Published Geological maps & Literatures.

Designed & Developed by Hydrogeology Division, NRSC, ISRO

L E G E N D

MAP UNIT (HYDROGEOMORPHIC UNIT) REPRESENTED IN THE MAP WITH ALPHANUMERIC CODE	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 PRE / POST- MONSOON (AVERAGE IN METERS) / NO. OF WELLS OBSERVED	RECHARGE CONDITIONS BASED ON AVAILABILITY OF WATER (RAINFALL & OTHER SOURCES)	GROUND WATER PROSPECTS: AQUIFER MATERIAL	TYPE OF WELLS SUITABLE	DEPTH RANGE OF WELLS (SUGGESTED) MIN - MAX (IN METERS)	YIELD RANGE OF WELLS (EXPECTED) (in LPM or m^3 / day)	HOMOGENEITY IN THE UNIT & SUCCESS RATE OF WELLS (PROBABILITY)	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	REMARKS (PROBLEMS / LIMITATIONS)
VFS81	Kuilapal Granite/ Manbhum Granite (Lower Proterozoic - 1200 mill. yrs)	Granite (81)	Valley Fill Shallow (VFS)	No wells observed	Moderate	LS Underlain by WM+FR	TW/BW	30 - 50	100 - 125 LPM	Moderate	P	10%	CD/DT Moderate	Prospect inferred as no wells observed. Recharge structures will improve groundwater prospects
BPS81			Buried Pediplain Shallow (BPS)	No wells observed	Limited	WM+FR	DW TW/BW	5 - 10 40 - 60	5 -10 m^3/day 50 - 75 LPM	Low	P	5%	RP High	Limitd grounwater resources. Priority of recharge structures is high
PPS81			Weathered Pediplain Shallow (PPS)	No wells observed	Poor	FR	DW TW/BW	5 - 10 40 - 60	5 -10 m^3 /day 30 - 50 LPM	Low	P	Negligible	RP High	Essentially run-off zone.Recharge structures may help in limited groundwater development
BJS81			Bajada Shallow (BJS)	No wells observed	Moderate	LS Underlain by WM+FR	DW TW/BW	10 - 15 90 - 100	10 - 15 m^3/day 100 - 125 LPM	Moderate	P	Nil	Not Required	Material deposited along slope and underlying Sandstone form the aquifer.Better yield at greater depths
HTW81			Hill Top Weathered (HTW)	No wells observed	Limited	WM+FR	DW TW/BW	< 5 25 - 30	< 5 m^3/day 30 - 50 LPM	Low	P	Nil	Not Required	Very small units,recharge structures not required
RH,SH,DHM 81			Residual, (RH) Structural, (SH) Denudational Hill/ Moderately dissected (DHM)	No wells observed	-	-	-	-	-	-	-	-	-	Run-off zone.Not suitable for groundwater development
BPS73	Mafic Intrusives (Lr.Proterozoic 2100 mill. yrs)	Anorthosite and Gabbroic Anorthosites (73)	Buried Pediplain Shallow (BPS)	6.17 / DW - 1	Limited	WM+FR	DW TW/ BW	5 -10 40 - 60	< 5 m^3/day 30 - 50 LPM	Low	P	Negligible	RP/DT High	Limited groundwater resources. Priority of recharge structures is high
VFS45	Dalma Group (Lr. Proterozoic - 2100 mill. yrs)	Quartzite (45)	Valley Fill Shallow (VFS)	No wells observed	Moderate	LS Underlain by WM+FR	TW / BW	30 - 50	100 - 125 LPM	Moderate	P	Nil	Not Required	Very small units, recharge structures not required
BPS45			Buried Pediplain Shallow (BPS)	No wells observed	Limited	WM+FR	DW TW / BW	5 - 10 40 - 60	5 - 10 m^3/day 50 - 75 LPM	Low	P	Nil	Not Required	Very small units, recharge structures not required
BJS45			Bajada Shallow (BJS)	No wells observed	Moderate	LS Underlain by WM+FR	DW TW / BW	10 - 15 90 - 100	10 - 15 m^3/day 100 - 125 LPM	Moderate	P	Nil	Not Required	Recharge is moderate. Better yields at greater depths within fractured rocks
CR,DHM 45			Curvilinear Ridge, (CR) Denudational Hill/ Moderately dissected (DHM)	No wells observed	-	-	-	-	-	-	-	-	-	Run-off zone.Not suitable for groundwater development
VFS922	Singhbhum Group (Lr. Proterozoic - 2300-2400 mill. yrs)	Epidiorite and Hornblende Schist (922)	Valley Fill Shallow (VFS)	No wells observed	Moderate	LS Underlain by WM+FR	TW / BW	30 - 50	100 - 125 LPM	Moderate	P	5%	CD/DT Moderate	Prospect inferred as no wells observed. Recharge structures will improve groundwater prospects
PPS922			Weathered Pediplain Shallow (PPS)	4.4 - 8.4 / DW - 7 HP - 15	Poor	FR	DW TW / BW	5 - 10 40 - 60	5 - 10 m^3/day 30 - 50 LPM	Low	P	Negligible	RP High	Essentially run-off zone.Recharge structures may help in limited groundwater development
BJS922			Bajada Shallow (BJS)	2.2 - 7.7 / DW - 3 HP - 2	Moderate	LS Underlain by WM+FR	DW TW / BW	10 - 15 90 - 100	10 - 15 m^3/day 100 - 125 LPM	Moderate	P	Nil	Not Required	Material deposited along slope and underlying weatherea material and fractured rock form the aquifer.Better yield at greater depths
HTW922			Hill Top Weathered (HTW)	2.9 - 6.4 / DW - 1 HP - 1	Limited	WM+FR	DW TW / BW	<5 25 - 30	<5 m^3/day 30 - 50 LPM	Low	P	10%	RP High	Prospects limited. Better prospects along fracture zones
RH,DHM 922			Residual, (RH) Denudational Hill/ Moderately dissected (DHM)	No wells observed	-	-	-	-	-	-	-	-	-	Run-off zone.Not suitable for groundwater development
VFS832	Chotonagpur Gneissic Complex (Lr.Proterozoic 2300-2400mill.yrs.)	Granitoid Gneiss (832)	Valley Fill Shallow (VFS)	No wells observed	Moderate	LS Underlain by WM+FR	TW / BW	30 - 50	150 - 175 LPM	Moderate	P	Nil	CD Moderate	Prospects inferred as no wells observed. Recharge condition is moderate with moderate groundwater prospects
BPS832			Buried Pediplain Shallow (BPS)	5.2 - 6.7 / DW - 1 HP - 1	Limited	WM+FR	DW TW / BW	5 - 10 40 - 60	10 - 15 m^3/day 75 - 100 LPM	Low	P	30%	RP High	Recharge structures will improve sustainability of groundwater sources
PPS832			Weathered Pediplain Shallow (PPS)	No wells observed	Poor	FR	DW TW / BW	5 - 10 40 - 60	5 - 10 m^3/day 30 - 50 LPM	Low	P	Nil	RP High	Due to high run off and poor infiltration, recharge structures are required to maintain sustainability of groundwater sources
VFS923	Unclassifiesd Metamorphics (Older Metamorphics) (Archean)	Mica Schist (923)	Valley Fill Shallow (VFS)	No wells observed	Moderate	LS Underlain by WM+FR	TW / BW	30 - 50	100 - 125 LPM	Moderate	P	5%	CD/DT Moderate	Prospect inferred as no wells observed. Recharge structures will improve groundwater prospects
BPM923			Buried Pediplain Moderate (BPM)	4.2 / HP - 1	Moderate	WM+FR	DW TW / BW	15 - 20 40 - 50	10 - 15 m^3/day 100 - 125 LPM	Moderate	P	20%	Not Required	Very small units,recharge structures not required
BPS923			Buried Pediplain Shallow (BPS)	3.7 - 8.2 / DW - 22 HP - 4	Limited	WM+FR	DW TW / BW	5 - 10 40 - 60	5 - 10 m^3/day 50 - 75 LPM	Low	P	5%	RP High	Limitd grounwater resources. Priority of recharge structures is high
PPS923			Weathered Pediplain Shallow (PPS)	4.4 - 8.4 / DW - 7 HP - 15	Poor	FR	DW TW / BW	5 - 10 40 - 60	5 - 10 m^3/day 30 - 50 LPM	Low	P	Negligible	RP High	Essentially run-off zone.Recharge structures may help in limited groundwater development
BJS923			Bajada Shallow (BJS)	2.2 - 7.7 / DW - 3 HP - 2	Moderate	LS Underlain by WM+FR	DW TW / BW	10 - 15 90 - 100	10 - 15 m^3/day 100 - 125 LPM	Moderate	P	Nil	Not Required	Material deposited along slope and underlying weatherea material and fractured rock form the aquifer.Better yield at greater depths
HTW923			Hill Top Weathered (HTW)	2.9 - 6.4 / DW - 1 HP - 1	Limited	WM+FR	DW TW / BW	<5 25 - 30	<5 m^3/day 30 - 50 LPM	Low	P	10%	RP High	Prospects limited. Better prospects along fracture zones
RH,SH,DHM 923			Residual, (RH) Structural, (SH) Denudational Hill/ Moderately dissected (DHM)	No wells observed	-	-	-	-	-	-	-	-	-	Run-off zone.Not suitable for groundwater development
VFS99		Shale,Slate and Phyllite Unclassified Metamorphics (99)	Valley Fill Shallow (VFS)	No wells observed	Moderate	LS Underlain by WM+FR	TW / BW	30 - 50	50 -75 LPM	Moderate	P	Nil	DT High	Loose sediments and mostly weathered zone form the aquifer, recharge structure will enhance sustainability of groundwater prospects
BPS99			Buried Pediplain Shallow (BPS)	No wells observed	Limited	WM+FR	DW TW / BW	5 - 10 40 - 60	<5 m^3/day 30 - 50 LPM	Low	P	10%	Not Required	Very small units,recharge structures not required
PPS99			Weathered Pediplain Shallow (PPS)	No wells observed	Poor	FR	DW TW / BW	5 - 10 40 - 60	5 - 10 m^3/day 30 - 50 LPM	Low	P	10%	Not Required	Very small units,recharge structures not required
RH 99			Residual Hill (RH)	No wells observed	-	-	-	-	-	-	-	-	-	Run-off zone. Not suitable for groundwater development

Aquifer material: LS = LOOSE SEDIMENTS; PR = PERMEABLE ROCK; FIR = FISSURED ROCK; FR = FRACTURED ROCK; WR / WM = WEATHERED ROCK / WEATHERED MATERIAL; IR = IMPERVIOUS ROCK; IM = IMPERVIOUS MATERIAL

Type of wells: DW = DUG WELL; RW = RING WELL; BW = BORE WELL; TW = TUBE WELL; DBW / DTW = DUG CUM-BORE WELL / DUG CUM-TUBE WELL

Recharge structures: PT = PERCOLATION TANK; CD = CHECK DAM; NB = NALA BUND; RW = RECHARGE WELL; DT = DESILTING OF TANK; RP = RECHARGE PIT; SD = SUBSURFACE DYKE; RS = RECHARGE SHAFT; ST = STORAGE TANK; SCM = SOIL CONSERVATION MEASURES

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.*

D___D / Q___Q / P___P These are dykes, quartz reefs and pegmatite veins, 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 location on the ground for wells and recharge structures should be identified based on follow-up ground hydrogeological/geophysical surveys.

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			
30 - 50 LPM	ORANGE			
20 - 30 LPM	BROWN			
10 - 20 LPM	PINK			
Prospects limited to valley portions only (Hills, Plateaus etc.)	RED			
Run-off zone/ Barrier for G.W. movement	RED		(Inselberg / Ridge / Dyke etc.)	

HYDROLOGICAL INFORMATION

DESCRIPTION	SYMBOL
CANAL / TANK IRRIGATED AREA	
GROUND WATER IRRIGATED AREA	
RIVER / STREAM (with sand)	
WATER BODY / SPRING	
CANAL	
RAIN GUAGE STATION (With average annual rainfall in mm)	800

RECHARGE STRUCTURES SUGGESTED

PERCOLATION TANK; NALA BUND; DESILTING OF TANK; SUBSURFACE DYKE; SOIL CONSERVATION MEASURES; CHECK DAM; RECHARGE WELL; RECHARGE PIT; RECHARGE SHAFT; STORAGE TANK

WELLS OBSERVED DURING FIELD VISIT

YIELD RANGE IN LPM	BORE / TUBE WELL	YIELD RANGE IN m^3/ day	DUG WELL / RING WELL
> 800 LPM	15/70	> 400 m^3 / day	8/15
400 - 800 LPM	15/70	200 - 400 m^3 / day	8/15
200 - 400 LPM	15/70	100 - 200 m^3 / day	8/15
100 - 200 LPM	15/70	50 - 100 m^3 / day	8/15
50 - 100 LPM	15/70	25 - 50 m^3 / day	8/15
30 - 50 LPM	15/70	15 - 25 m^3 / day	8/15
20 - 30 LPM	15/70	10 - 15 m^3 / day	8/15
10 - 20 LPM	15/70	5 - 10 m^3 / day	8/15
< 10 LPM	15/70	< 5 m^3 / 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 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

LITHOLOGY / GEOMORPHIC UNIT BOUNDARY

	MINOR	MAJOR
FAULT	F___F	F___F
THRUST	T___T	T___T
FRACTURE / LINEAMENT		
FRACTURE / LINEAMENT (Inferred)		

SHEAR ZONE	(Confirmed / Inferred)	S___S / S – – S
DYKE	(Confirmed / Inferred)	D___D / D – – D
QUARTZ REEF	(Confirmed / Inferred)	Q___Q / Q – – Q
PEGMATITIE VEIN	(Confirmed / Inferred)	P___P / P – – P

Lithologic contacts are inferred at places & Geomorphic boundaries are gradational

BASE MAP INFORMATION

SYMBOL	DESCRIPTION
NH - 2	NATIONAL HIGHWAY
SH - 9	STATE HIGHWAY
	METALLED ROAD
	OTHER ROAD
	RAILWAY
	CITY / VILLAGE
	HABITATIONS : NON - COVERED (NC) PARTIALLY COVERED (PC)
	BOUNDARY : STATE
	DISTRICT
	BLOCK

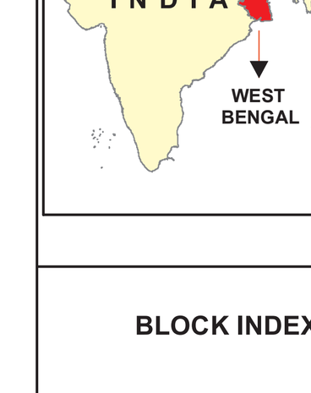
OTHER INFORMATION

Rainfall : 1322mm

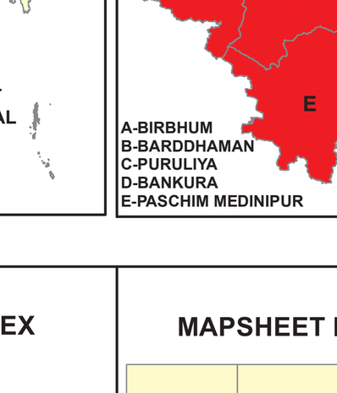
(Source IMD)

LOCATION INFORMATION

STATE INDEX

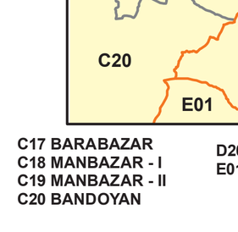


DISTRICT INDEX



A-BIRBHUM
B-BARDDHAMAN
C-PURULIYA
D-BANKURA
E-PASCHIM MEDINIPUR

BLOCK INDEX



C17 BARABAZAR
C18 MANBAZAR - I
C19 MANBAZAR - II
C20 BANDOYAN
D20 RANIBUNDH
E01 BINPUR - II

MAPSHEET INDEX

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