GROUND WATER PROSPECTS MAP

(PREPARED FROM SATELLITE IMAGE INTERPRETATION WITH LIMITED FIELD CHECKS)

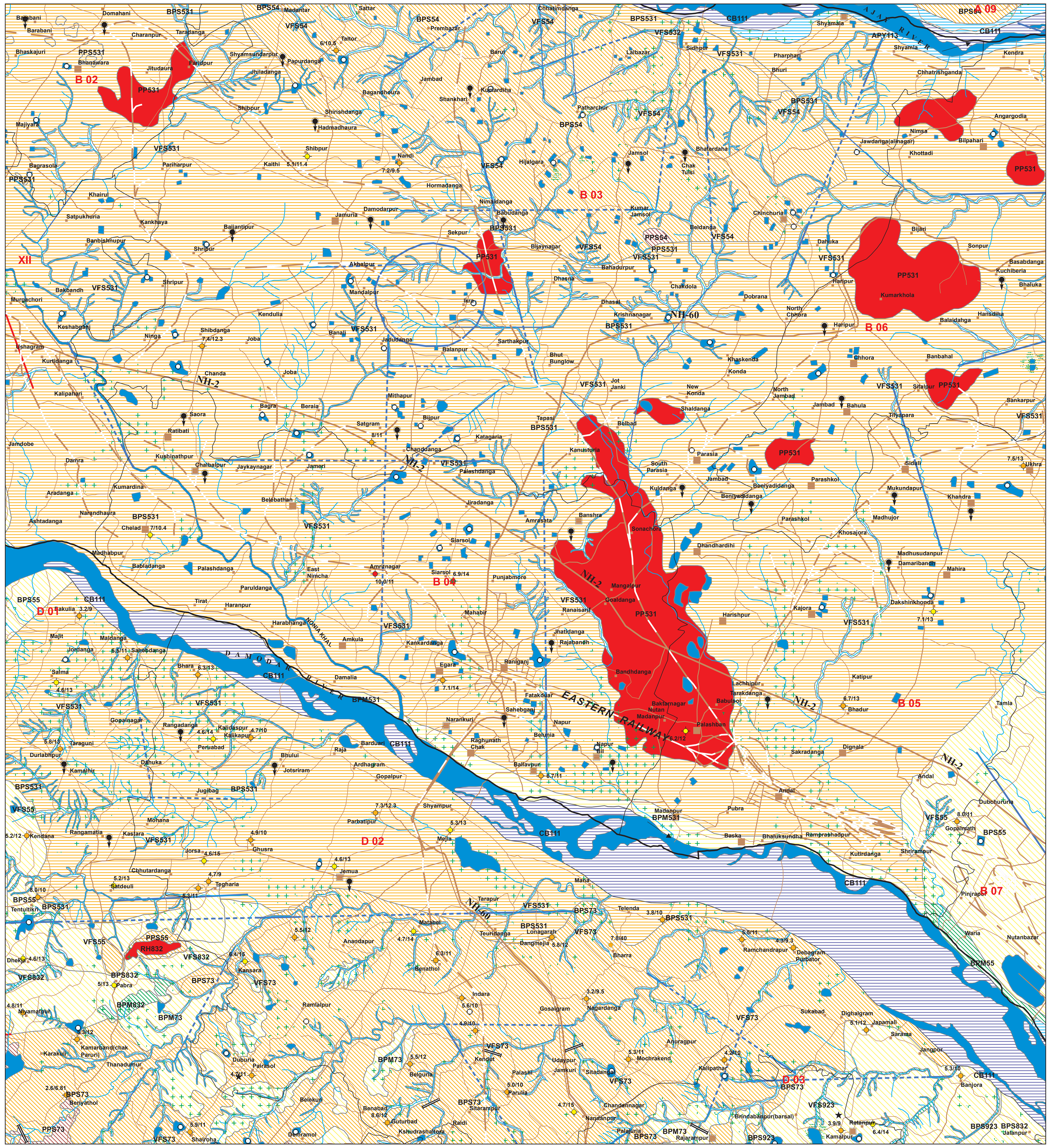
0 1 2 3 4 5 Kilometers

SCALE - 1 : 50,000

N / S / E / W

MAP SHEET NO. 73M/2

BANKURA, BARDDHAMAN & BIRBHUM DISTRICTS, WEST BENGAL



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 (LS = LOOSE SEDIMENTS, PR = PERMEABLE ROCK, FIR = FISSURED ROCK, FR = FRACTURED ROCK, WR / = WEATHERED ROCK / WM WEATHERED MATERIAL, IR = IMPERVIOUS ROCK, IM = IMPERVIOUS MATERIAL)	TYPE OF WELLS SUITABLE (DW = DUG WELL, RW = RING WELL, BW = BORE WELL, TW = TUBE WELL, DBW / DTW = DUG CUM-BORE WELL / DUG CUM-TUBE WELL)	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) 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, SD = SUBSURFACE DYKE, RS = RECHARGE SHAFT, ST = STORAGE TANK, SCM = SOIL CONSERVATION MEASURES)	REMARKS (PROBLEMS / LIMITATIONS)
CB111	Hugli Formation (Present Day): Alluvium (Sand Dominant) (111)	Channel Bar (CB)	5 - 6 / 2	Excellent	LS	TW	5-10 m	400-500 LPM	Very High	P	42%	Not Required	Groundwater prospects very high with high recharge potential. Recharge structures not required.
PB111		Point Bar (PB)	6 / 1	Very Good	LS	RW TW	5-10 m	300-400 LPM	Very High	P	7%	Not Required	Groundwater prospects very high with high recharge potential. Recharge structures not required.
APY113	Panskura Formation (Upper Holocene): Alluvium (Sand Dominant) (113)	Alluvial Plain Younger (APY)	No wells observed	Very Good	LS	DW TW	10 - 12 m 20 - 30 m	125 - 150 m^3/day 200 - 200 LPM	Very High	P	20%	Not Required	Aquifer is formed of Sandy part of alluvium. Recharge structures not required as good recharge conditions prevail
VFS55	Gondwana Supergroup (Carboniferous to Jurassic): Shale with Sandstone Bands (Panchet Formation) (55)	Valley Fill Shallow (VFS)	No wells observed	Good	LS Underlain by WM+FR	TW / BW	30 - 50 m	100 - 125 LPM	Moderate	P	40%	DT Moderate	Recharge structures will increase sustainability of groundwater prospect
BPM55		Buried Pediment Medium (BPM)	No wells observed	Moderate	WM+FR	DW TW / BW	15 - 20 m 40 - 50 m	10 - 15 m^3/day 100 - 125 LPM	Moderate	P	10%	Not Required	Recharge structures not required since units are very small with no settlements
BPS55		Buried Pediplain Shallow (BPS)	4.65 - 8.03 / DW - 4	Limited	WM+FR	DW TW/ BW	15 - 20 m 40 - 60 m	5 - 10m^3/day 50 - 100 LPM	Low	P	30%	Not Required	Aquifer conditions modified by coal mining activities Groundwater development may not be sustainable in the long run.Areas of piped water supply
PPS55		Weathered Pediplain Shallow (PPS)	No wells observed	Limited	FR	DW TW/ BW	15 - 20 m 40 - 60 m	5 - 10m^3/day 30 - 50 LPM	Low	P	Negligible	Not Required	Recharge structures not required since units are very small with no settlements
VFS54	Sandy Shale (Barren Measure) (54)	Valley Fill Shallow (VFS)	No wells observed	Good	LS Underlain by WM+FR	TW / BW	30 - 50 m	50 - 75 LPM	Moderate	P	10%	DT Moderate	Groundwater prospects moderate, recharge structures will improve the sustainability of groundwater sources
BPS54		Buried Pediplain Shallow (BPS)	6.08 / DW - 1	Limited	WM+FR	DW TW / BW	5 - 10 m 40 - 60 m	< 5 m^3/day 30 - 50 LPM	Low	P	10%	RW / DT Moderate	Recharge structures will increase scope for groundwater development
PPS54		Weathered Pediplain Shallow (PPS)	No wells observed	Poor	FR	DW TW / BW	5 - 10 m 40 - 60 m	< 5 m^3/day 20 - 30 LPM	Low	P	Nil	Not Required	Very small unit,recharge structure not required
VFS531	Sandstone & Shale with Coal (Raniganj Formation) (531)	Valley Fill Shallow (VFS)	No wells observed	Good	LS Underlain by WM+FR	TW / BW	20 - 25 m	75 - 100 LPM	Moderate	P	40%	Not Required	Aquifer conditions modified by coal mining activities Groundwater development may not be sustainable in the long run.Areas of piped water supply
BPM531		Buried Pediplain Moderate (BPM)	No wells observed	Moderate	WM+FR	DW TW / BW	5 -10 m 20 - 25 m	15 - 25 m^3/day 75 - 100 LPM	Moderate	P	30%	Not Required	Aquifer conditions modified by coal mining activities Groundwater development may not be sustainable in the long run.Areas of piped water supply
BPS531		Buried Pediplain Shallow (BPS)	3.25 - 10.07 / DW - 28	Moderate	WM+FR	DW TW / BW	5 - 10 m 20 - 30 m	10 - 15 m^3/day 30 - 50 LPM	Low	P	Nil	Not Required	Aquifer conditions modified by coal mining activities Groundwater development may not be sustainable in the long run.Areas of piped water supply
PPS531		Weathered Pediplain Shallow (PPS)	No wells observed	Limited	FR	DW TW / BW	5 - 10 m 20 - 30 m	5 - 10 m^3/day 30 - 50 LPM	Low	P	Nil	Not Required	Aquifer conditions modified by coal mining activities Groundwater development may not be sustainable in the long run.Areas of piped water supply
PP531		Weathered Pediplain (PP)	6.21 / DW - 1	-	-	-	-	-	-	-	-	-	Active Open Cast Coal Mines.Groundwater development not feasible
VFS532	Sandstone & Shale with Coal (Barakar Formation) (532)	Valley Fill Shallow (VFS)	No wells observed	Good	LS Underlain by WM+FR	TW / BW	20 - 25 m	75 - 100 LPM	Moderate	P	40%	Not Required	Aquifer conditions modified by coal mining activities Groundwater development may not be sustainable in the long run.Areas of piped water supply
VFS73	Mafic Intrusives (Lr. Proterozoic -1470 mill.yrs): Anorthosite and Grabbroic Anorthosite (73)	Valley Fill Shallow (VFS)	No wells observed	Moderate	LS Underlain by WM+FR	TW/ BW	30 - 50 m	50 - 75 LPM	Moderate	P	60%	CD Moderate	Prospect inferred as no wells observed. Recharge structure will improve groundwater prospects
BPM73		Buried Pediplain Moderate (BPM)	No wells observed	Moderate	WM+FR	DW TW/ BW	5 - 10 m 40 - 50 m	5 - 10m^3/day 50 -75 LPM	Moderate	P	30%	RP Moderate	Weathered material and underlying fracture rock form the aquifer.Sustainability of groundwater yield can be increased with recharge structure
BPS73		Buried Pediplain Shallow (BPS)	2.6 - 8.69 / DW - 20 HP - 1	Limited	WM+FR	DW TW/ BW	5 -10 m 40 - 60 m	< 5 m^3/day 30 - 50 LPM	Low	P	20%	RP High	Limited grounwater resources.Priority of recharge structures is high
PPS73		Weathered Pediplain Shallow (PPS)	No wells observed	Poor	FR	DW TW/ BW	5 -10 m 40 - 60 m	< 5 m^3/day 30 - 50 LPM	Low	P	Nil	RP High	Essentially run-off zone.Recharge structure may help in limited groundwater development
VFS832	Chhotanagpur Granite Gneiss Complex (Lower Proterozoic-2300 - 2400 mill.yrs): Granitoid Gneiss (832)	Valley Fill Shallow (VFS)	No wells observed	Moderate	LS Underlain by WM+FR	TW / BW	30 - 50 m	150 - 175 LPM	Moderate	P	Nil	CD Moderate	Prospects inferred as no wells observed. Recharge condition is moderate with moderate groundwater prospects
BPM832		Buried Pediplain Moderate (BPM)	No wells observed	Moderate	WM+FR	DW TW / BW	5 - 10 m 40 - 50 m	15 - 25 m^3/day 150 - 175 LPM	Moderate	P	50%	RP Moderate	Recharge structure will improve ground water prospects
BPS832		Buried Pediplain Shallow (BPS)	4.84 - 5 / DW - 2	Limited	WM+FR	DW TW / BW	5 - 10 m 40 - 60 m	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 m 40 - 60 m	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
RH832		Residual Hill (RH)	No wells observed	-	-	-	-	-	-	-	-	-	Run-off zone. Not suitable for groundwater development
VFS923	Unclassified Metamorphics (Older Metamorphics) (Archaean): Mica Schist (923)	Valley Fill Shallow (VFS)	No wells observed	Moderate	LS Underlain by WM+FR	TW / BW	30 - 50 m	100 - 125 LPM	Moderate	P	10%	CD Moderate	Prospects inferred as no well observed. Recharge condition is moderate with moderate groundwater prospects
BPS923		Buried Pediplain Shallow (BPS)	3.91 - 6.21 / DW - 4	Limited	WM+FR	DW TW / BW	5 - 10 m 40 - 60 m	5 - 10 m^3/day 50 - 75 LPM	Low	P	5%	RP High	Recharge structures will improve sustainability of groundwater sources

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.

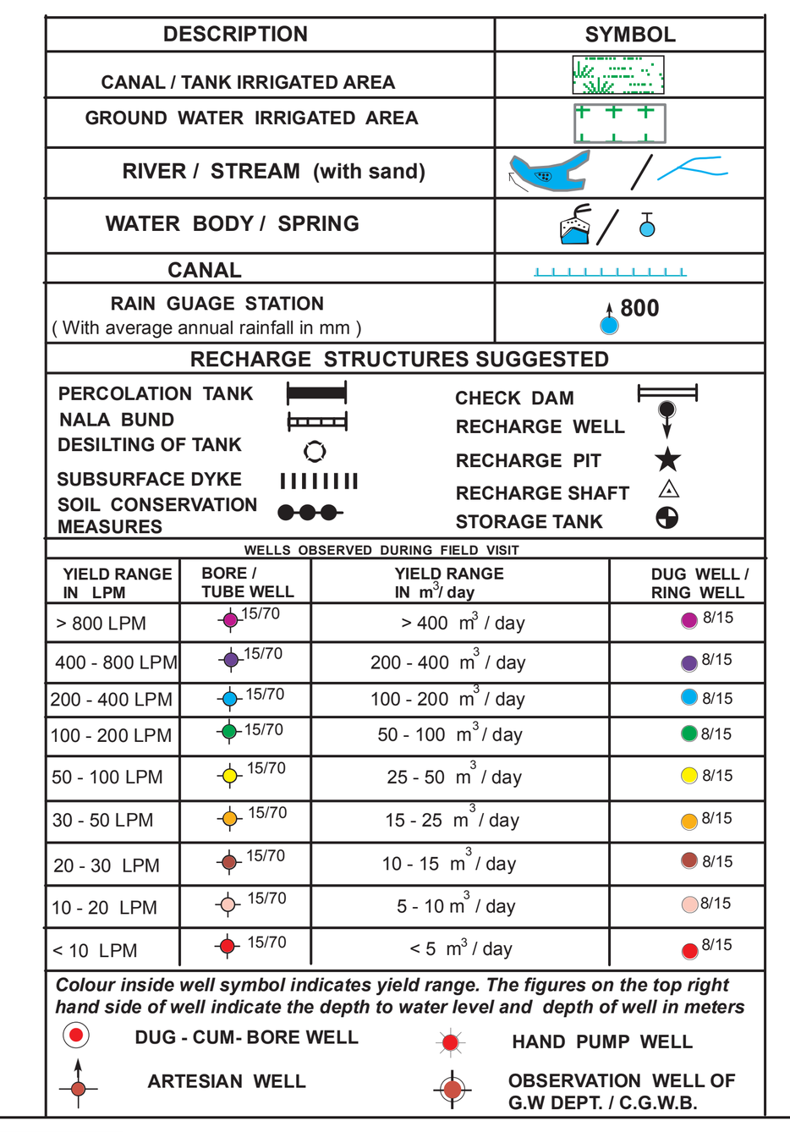
D____D / Q____Q / P____P These are dykes, quartz reefs and pegmatite veins, which generally act as barriers for ground water movement.

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

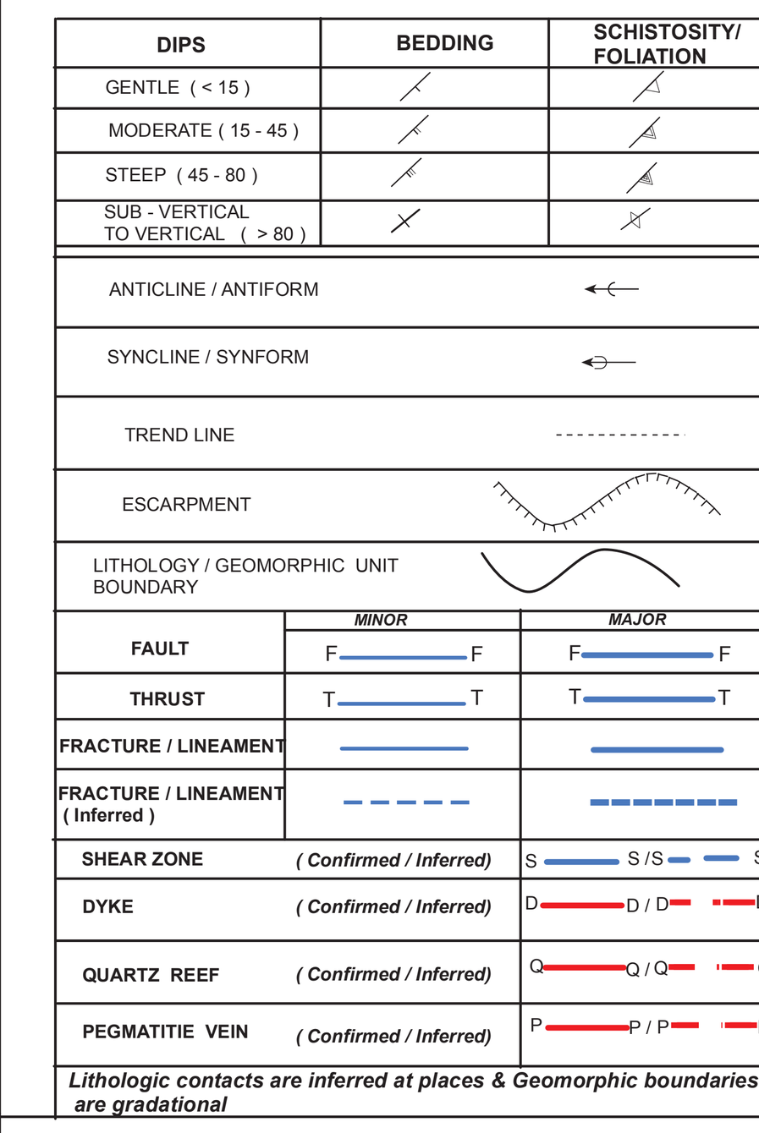
YIELD RANGE OF WELLS	COLOUR CODE	DEPTH RANGE OF WELLS: SHALLOW < 30 METERS	MODERATE 30 - 80 METERS	DEEP > 80 METERS
> 800 LPM	VIOLET			
400 - 800 LPM	INDIGO			
200 - 400 LPM	BLUE			
100 - 200 LPM	GREEN			
50 - 100 LPM	YELLOW			
30 - 50 LPM	ORANGE			
20 - 30 LPM	BROWN			
10 - 20 LPM	PINK			
Prospects limited to valley portions only (Hills, Plateaus etc.)	RED			
Run-off zone/ Barrier for G.W. movement	RED		(Inselberg / Ridge / Dyke etc.)	

HYDROLOGICAL INFORMATION



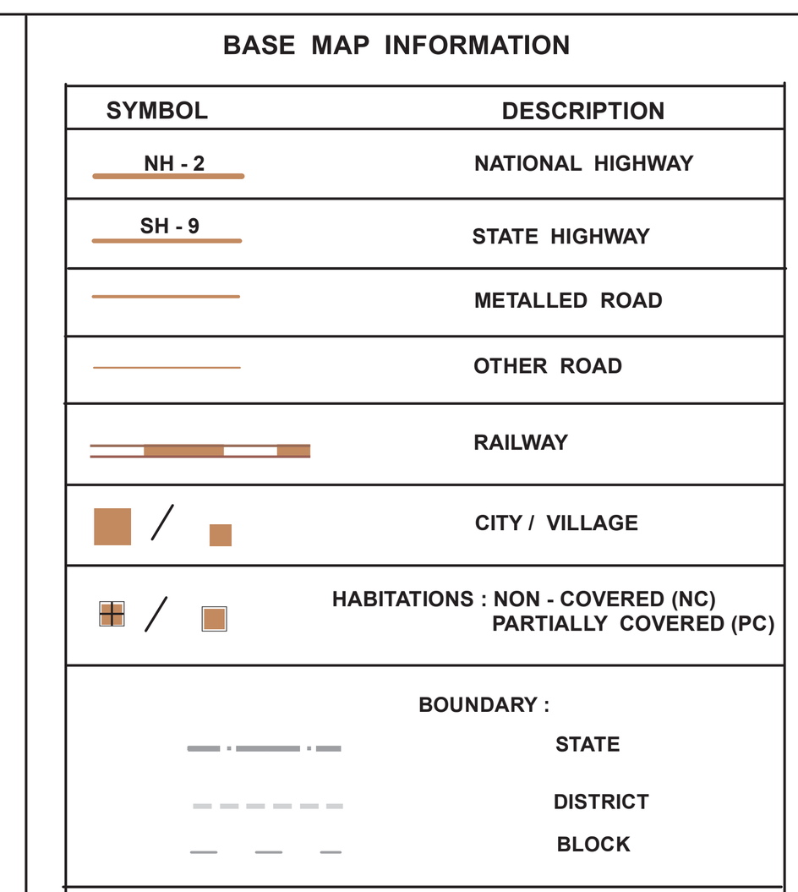
DESCRIPTION
SYMBOL
CANAL / TANK IRRIGATED AREA
GROUND WATER IRRIGATED AREA
RIVER / STREAM (with sand)
WATER BODY / SPRING
CANAL
RAIN GUAGE STATION (With average annual rainfall in mm)
800
RECHARGE STRUCTURES SUGGESTED
PERCOLATION TANK
NALA BUND
DESILTING OF TANK
SUBSURFACE DYKE
SOIL CONSERVATION MEASURES
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 m³/ day
DUG WELL / RING WELL
> 800 LPM
400 - 800 LPM
200 - 400 LPM
100 - 200 LPM
50 - 100 LPM
30 - 50 LPM
20 - 30 LPM
10 - 20 LPM
< 10 LPM
15/70
> 400 m³ / day
200 - 400 m³ / day
100 - 200 m³ / day
50 - 100 m³ / day
25 - 50 m³ / day
15 - 25 m³ / day
10 - 15 m³ / day
5 - 10 m³ / day
< 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 depth of well in meters
DUG - CUM- BORE WELL
ARTESIAN WELL
HAND PUMP 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
THRUST
FRACTURE / LINEAMENT
FRACTURE / LINEAMENT (Inferred)
SHEAR ZONE (Confirmed / Inferred)
DYKE (Confirmed / Inferred)
QUARTZ REEF (Confirmed / Inferred)
PEGMATITIE VEIN (Confirmed / Inferred)
Lithologic contacts are inferred at places & Geomorphic boundaries are gradational

BASE MAP INFORMATION

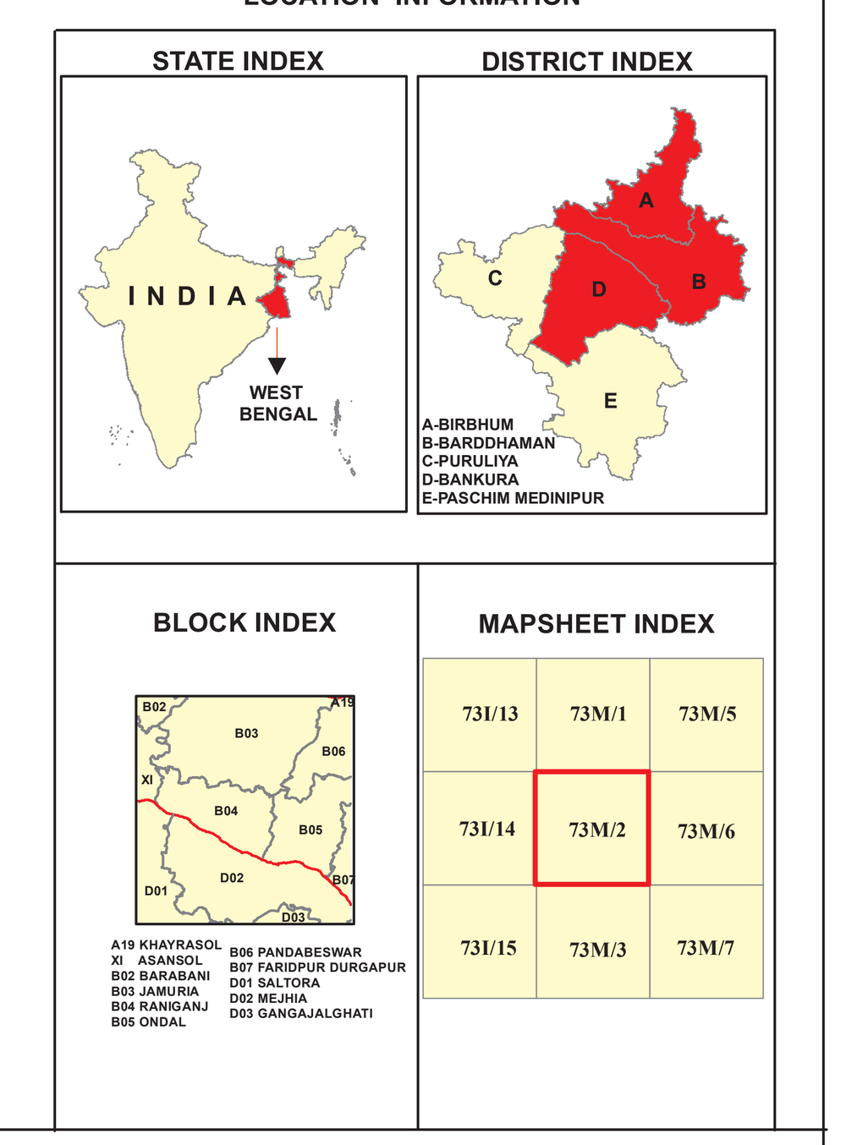


OTHER INFORMATION

Rainfall : 1431mm

(Source IMD)

LOCATION INFORMATION



STATE INDEX
DISTRICT INDEX
INDIA
WEST BENGAL
BLOCK INDEX
MAPSHEET INDEX
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73M/5
73I/14
73M/2
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73I/15
73M/3
73M/7
A19 KHAYRASOL
XI ASANSOL
B02 BARABANI
B03 JAMURIA
B04 RANIGANJ
B05 ONDAL
B06 PANDABESWAR
B07 FARIDPUR DURGAPUR
D01 SALTORA
D02 MEJHIA
D03 GANGAJALGHATI

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GEOINFORMATICS & REMOTE SENSING CELL
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GEOLOGICAL SURVEY OF INDIA
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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.

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