GROUND WATER PROSPECTS MAP

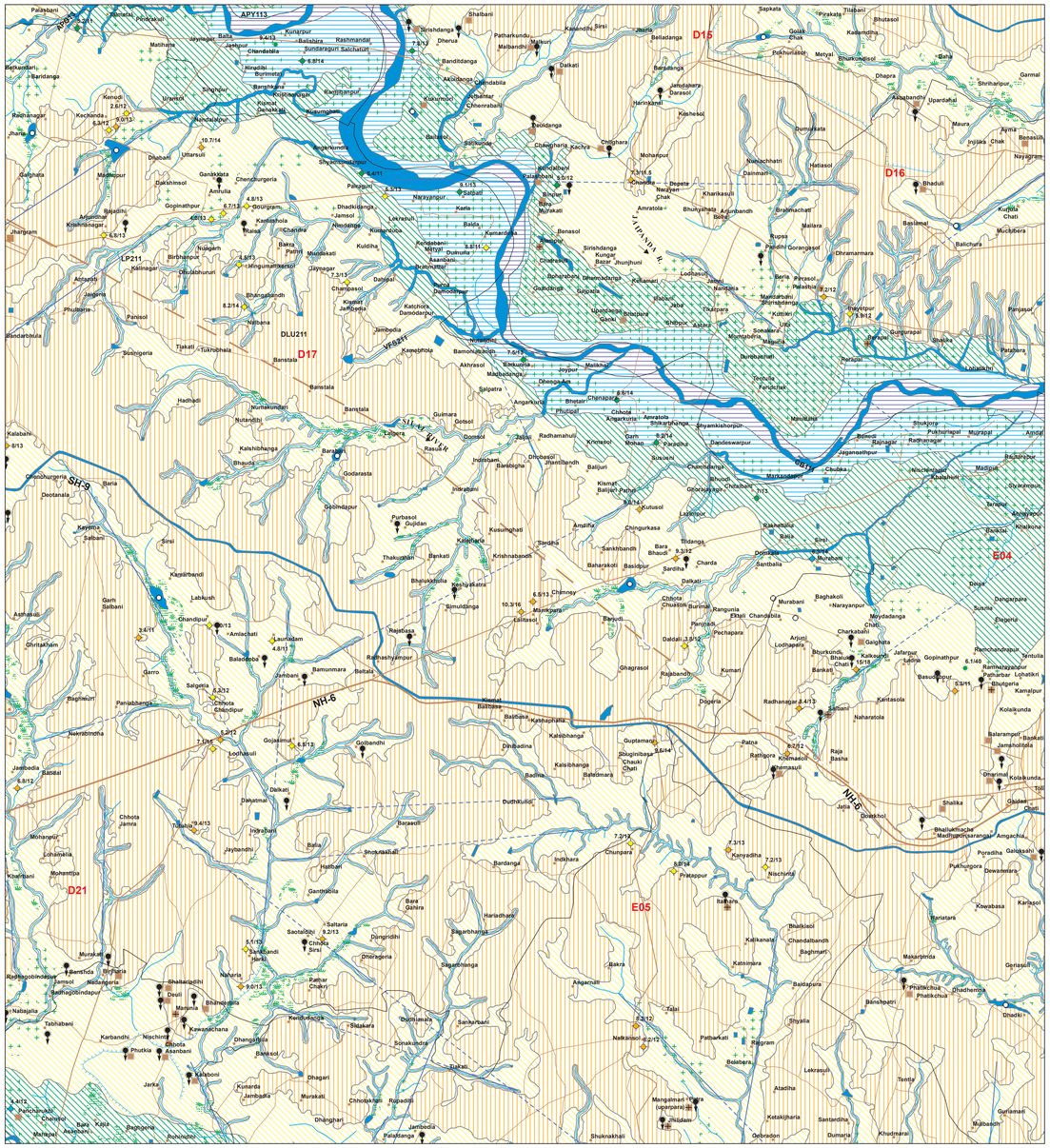
(PREPARED FROM SATELLITE IMAGE INTERPRETATION WITH LIMITED FIELD CHECKS)

Kilometers
0 1 2 3 4 5

SCALE - 1 : 50,000

MAP SHEET NO. 73N/1

PASCHIM MEDINIPUR DISTRICT, 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 (COLOUR INDICATES YIELD RANGE AND HATCHING INDICATE DEPTH RANGE)	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; FR = FISSURED ROCK; FR = FRACTURED ROCK; WM = WEATHERED MATERIAL; WR = WEATHERED MATERIAL; IR = IMPERVIOUS ROCK)	TYPE OF WELLS SUITABLE (DW = DUG WELL; TW = TUBE WELL; DTW = DUG CUM-TUBE WELL; BW = BORE WELL; DBW = DUG CUM-BORE 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; ST = STORAGE TANK; RP = RECHARGE PIT; SD = SUBSURFACE DYKE; RS = RECHARGE SHAFT; ST = STORAGE TANK; SCM = SOIL CONSERVATION MEASURES)	REMARKS (PROBLEMS / LIMITATIONS)
CB111	Alluvium (Sand Dominant) (111) — Hugli/Bhagirathi Formation (Present Day)	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	Alluvium (Sand Dominant) (111) — Hugli/Bhagirathi Formation (Present Day)	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	Alluvium (Sand and Silt) (113) — Arambagh Fm (Early to Late Holocene)	Alluvial Plain Younger (APY)	4.6 - 8.6 / DW - 4	Very Good	LS	DW, TW	10 - 12 m; 20 - 30 m	100 - 125 m^3/day; 200 - 250 LPM	Very High	P	30%	Not Required	Aquifer is formed of sandy part of alluvium. Recharge structures are not required as good recharge condition prevails.
APO13	Alluvium (Sand, Silt and Clay) (13) — Sijua/Rampurhat Fm (Late Pleistocene to Early Holocene)	Alluvial Plain Older (APO)	No wells observed	Good	LS	DW, TW	10 - 15 m; 40 - 60 m	50 - 75 m^3/day; 150 - 200 LPM	High	P	Nil	Not Required	Aquifer is formed of sandy part of alluvium. Recharge structures are not required as good recharge condition prevails.
VFS211	Laterite (Ferricrete-hard crust lateritic nodules and lithomarge clay) (211) — Lalgarh/Jamboni Formation (Middle to Upper Pleistocene)	Valley Fill Shallow (VFS)	No wells observed	Moderate	LS Underlain by WM + FR	TW / BW	40 - 50 m	50 - 100 LPM	Moderate	P	Nil	DT Moderate	Recharge structure will increase the sustainability of ground water prospects
LP211	Laterite (Ferricrete-hard crust lateritic nodules and lithomarge clay) (211) — Lalgarh/Jamboni Formation (Middle to Upper Pleistocene)	Lateritic Plain (LP) (Lithomarge Clay)	2.1 - 6.5 / DW - 19 HP - 1	Limited	WM + FR	DW; TW / BW	15 - 20 m; 50 - 60 m	15 - 25 m^3/day; 50 - 100 LPM	Moderate	P	25%	RW / DT High	Recharge wells have high priority as the lithomarge clay layer needs to be penetrated to recharge underlying aquifer formed of weathered material and fractured rock
DLU211	Laterite (Ferricrete-hard crust lateritic nodules and lithomarge clay) (211) — Lalgarh/Jamboni Formation (Middle to Upper Pleistocene)	Dissected Lateritic Upland (DLU) (Hard Crust and lateritic nodules)	2.4 - 7.7 / DW - 5	Poor to limited	WM + IR (Impervious Material)	TW / BW	80 -100 m	30 - 50 LPM	Low	P	Nil	Not Required	Essentially run-off zone where hard crust is present. Areas of lateritic nodules are recharge zones with deep water table conditions.Primarily forest areas with sparse settelments.Not suitable for large scale development of ground water.
VFS832	Granitoid Gneiss (832) — Chhotanagpur Gneissic Complex (Lower Proterozoic-2300 - 2460 mn yrs.)	Valley Fill Shallow (VFS)	No wells observed	Moderate	LS Underlain by WM + FR	TW / BW	30 - 50 m	150 - 175 LPM	Moderate	P	Nil	Not Required	Prospects inferred as no wells observed. Recharge condition is moderate with moderate ground water prospects.
BPM832	Granitoid Gneiss (832) — Chhotanagpur Gneissic Complex (Lower Proterozoic-2300 - 2460 mn yrs.)	Buried Pediment 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	Nil	Not Required	Very small unit, no settlements, recharge structure not required
BPS832	Granitoid Gneiss (832) — Chhotanagpur Gneissic Complex (Lower Proterozoic-2300 - 2460 mn yrs.)	Buried Pediment Shallow (BPS)	No wells observed	Limited	WM + FR	DW; TW / BW	5 - 10 m; 40 - 60 m	10 - 15 m^3/day; 75 - 100 LPM	Low	P	Nil	Not Required	Very small unit, no settlements, recharge structure not required

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; D — — D /Q — — Q / F — — 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 - 50 METERS)	DEEP (> 50 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		(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	19/70	> 400 m^3 / day	8/15
400 - 800 LPM	19/70	200 - 400 m^3 / day	8/15
200 - 400 LPM	19/70	100 - 200 m^3 / day	8/15
100 - 200 LPM	19/70	50 - 100 m^3/ day	8/15
50 - 100 LPM	19/70	25 - 50 m^3 / day	8/15
30 - 50 LPM	19/70	15 - 25 m^3 / day	8/15
20 - 30 LPM	19/70	10 - 15 m^3 / day	8/15
10 - 20 LPM	19/70	5 - 10 m^3 / day	8/15
< 10 LPM	19/70	< 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 - 90)		
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
PEGMATITE 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 : 1542mm

(Source IMD)

LOCATION INFORMATION

STATE INDEX: INDIA; WEST BENGAL

DISTRICT INDEX: A-BIRBHUM; B-BARDDHAMAN; C-BANKURA; D-RANIGUNJ; E-PASCHIM MEDINIPUR

BLOCK INDEX: D15 BINPUR - I; D16 BELPAHARI; D17 SALBANI; E04 JHARGRAM; E05 KHARAGPUR I; D21 GOPIBALLAVPUR; E15 SANKRAIL

MAPSHEET INDEX

73J/14	73N/2	73N/6
73J/15	73N/3	73N/7
73J/16	73N/4	73N/8

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