GROUND WATER PROSPECTS MAP

(PREPARED FROM SATELLITE IMAGE INTERPRETATION WITH LIMITED FIELD CHECKS)

Kilometers

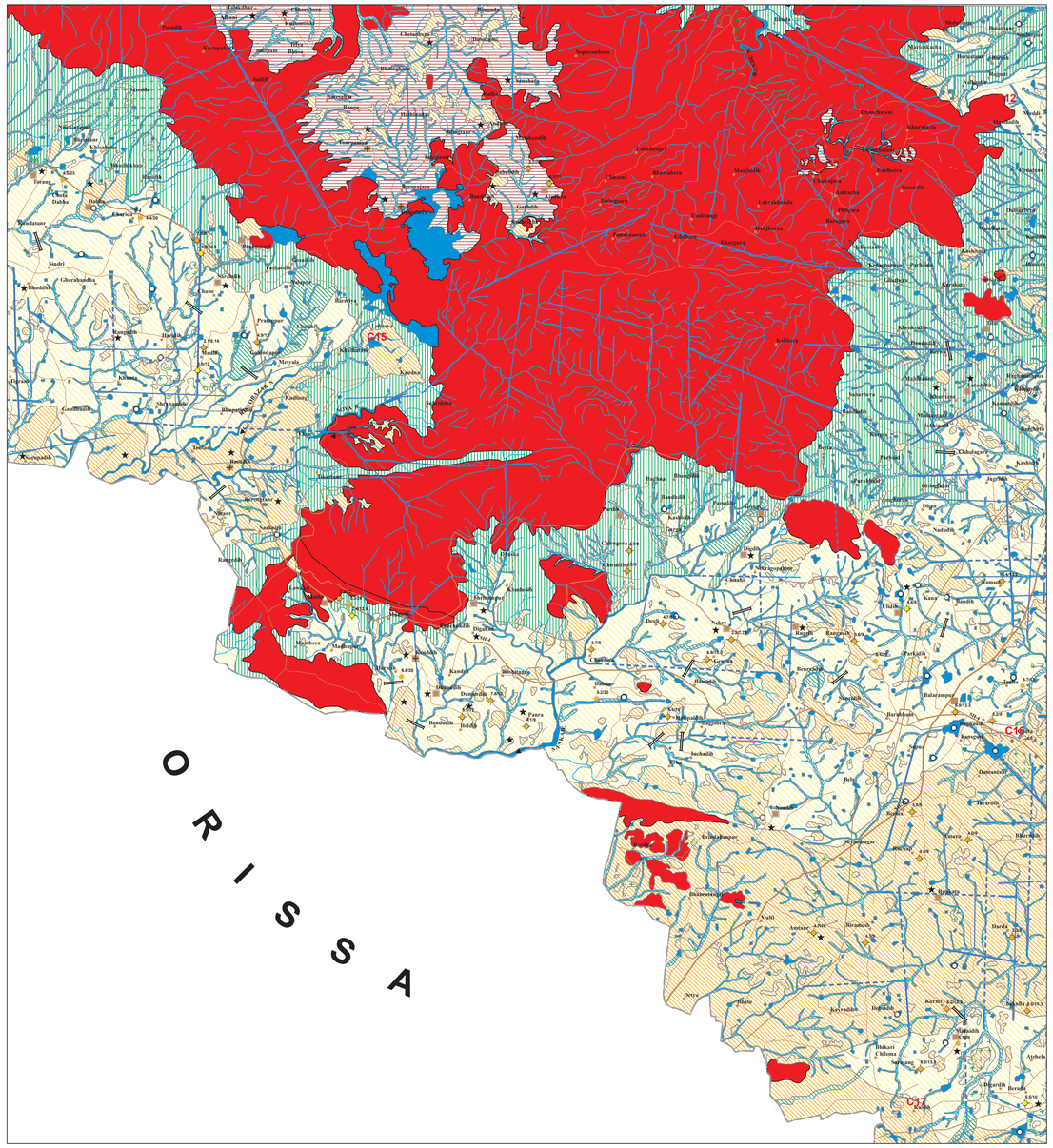
0 1 2 3 4 5

SCALE - 1 : 50,000

N W E S

MAP SHEET NO. 73I/4

PURULIYA DISTRICT, WEST BENGAL



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)	GROUNDWATER 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)
					LS = LOOSE SEDIMENTS; PR = POREMABLE ROCK; FR = FISSURED ROCK; FR = FRACTURED ROCK; WR = WEATHERED ROCK; WM = WEATHERED MATERIAL; IR = IMPERVIOUS ROCK; IM = IMPERVIOUS MATERIAL	DW = DUG WELL; TW = TUBE WELL; BW = BORE WELL; TW = TUBE WELL; DBW = DUG CUM-BORE WELL; DTW = DUG CUM-TUBE WELL						PT = PERCOLATION TANK; CD = CHECK DAM; NB = NALA BUND; RW = RECHARGE WELL; DT = DESILTING TANK; RP = RECHARGE PIT; SD = SUBSURFACE DYKE; RS = RECHARGE SHAFT; ST = STORAGE TANK; SCM = SOIL CONSERVATION MEASURES	
BPS73	(Lower Proterozoic (1250 mill yrs.)) Anorthosite and Gabbroic Anorthosite (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
VFS922	(Lower Proterozoic-2200 - 2400 mill yrs.) Epidiorite, 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	40%	CD/DT Moderate	Prospect inferred as no wells observed. Recharge structures will improve ground water prospects
BPM922		Buried Pediplain Moderate (BPM)	5.44 / DW - 1	Moderate	WM+FR	DW / TW / BW	5 - 10 / 40 - 50	10 - 15 m^3/day / 100 - 125 LPM	Moderate	P	35%	RP Moderate	Weathered material and underlying fractured rock form the aquifer.Sustainability of groundwater yield can be increased with recharge structure
PPS922		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	Essentially run-off zone.Recharge structure may help in limited groundwater development
LR922		Linear Ridge (LR)	No wells observed	–	–	–	–	–	–	–	–	–	Run-off zone, not suitable for ground water development
RH922		Residual Hill (RH)	No wells observed	–	–	–	–	–	–	–	-	–	Run-off zone, not suitable for ground water development
VFS832	(Lower Proterozoic-2200 - 2400 mill yrs.) Chhotanagpur Gneissic Complex 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	35%	CD/DT 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 / 40 - 50	15 - 25 m^3/day / 150 - 175 LPM	Moderate	P	30%	RP Moderate	Recharge structure will improve ground water prospects
BPS832		Buried Pediplain Shallow (BPS)	2.1 - 6.9 / DW - 7 HP - 4	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)	2.72 - 4.64 / DW - 2	Poor	FR	DW / TW / BW	5 - 10 / 40 - 60	5 - 10 m^3/day / 30 - 50 LPM	Low	P	Nil	RP/DT High	Due to high run-off and poor infiltration, recharge structures are required to maintain sustainability of groundwater sources
BJS832		Bajada Shallow (BJS)	2.52 - 4.75 / DW - 3	Moderate	LS Underlain by WM+FR	DW / TW / BW	10 - 15 / 90 - 100	15 - 25 m^3/day / 150 - 175 LPM	Moderate	P	40%	Not Required	Recharge is moderate. Better yields at greater depths within fractured rock
HTW832		Hill Top Weathered (HTW)	6.15 / DW - 1	Limited	WM+FR	DW / TW / BW	< 5 / 25 - 30	<5 m^3/day / 20 - 30 LPM	Low	P	Nil	RP Moderate	Prospects limited Better prospects along fracture controlled valleys.Priority of recharge structure is moderate since few settlements are present
RH832		Residual Hill (RH)	No wells observed	–	–	–	–	–	–	–	–	–	Run-off zone, not suitable for ground water development
DHM832		Denudational Hill/ Moderately dissected (DHM)	No wells observed	–	–	–	–	–	–	–	–	–	Run-off zone, not suitable for ground water development
VFS923	(Archaean) Unclassified Metamorphics (Older Metamorphics) 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	35%	CD Moderate	Prospects inferred as no well observed. Recharge condition is moderate with moderate groundwater prospects
BPM923		Buried Pediplain Moderate (BPM)	No wells observed	Moderate	WM+FR	DW / TW / BW	15 -20 / 40 - 50	10 - 15 m^3/day / 100 - 125 LPM	Moderate	P	Negligible	Not Required	Very small units,sparse settlements, recharge structures not required
BPS923		Buried Pediplain Shallow (BPS)	2.33 - 7.88 / DW - 8 HP - 1	Limited	WM+FR	DW / TW / BW	5 -10 / 40 - 60	< 5 m^3/day / 50 - 75 LPM	Low	P	20%	RP/DT High	Limited groundwater resources.Priority of recharge structures is high
PPS923		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
BJS923		Bajada Shallow (BJS)	2.46 - 7.21 / DW - 2 HP - 1	Moderate	LS Underlain by WM+FR	DW / TW / BW	10 - 15 / 90 - 100	10 - 15 m^3/day / 100 - 125 LPM	Moderate	P	25%	Not Required	Recharge is moderate. Better yields at greater depths within fractured rocks
RH923		Residual Hill (RH)	No wells observed	–	–	–	–	–	–	–	–	–	Run-off zone, not suitable for ground water development
VFS99	Shale,Slate,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	25%	CD/DT High	Loose sediments and mostly weathered zone form the aquifer, recharge structure will enhance sustainability of groundwater prospects
BPM99		Buried Pediplain Moderate (BPM)	No wells observed	Moderate	WM+FR	DW / TW / BW	5 - 10 / 40 - 50	5 - 10 m^3/day / 50 - 75 LPM	Moderate	P	40%	RP Moderate	Weathered material and underlying fracture rock form the aquifer.Sustainability of groundwater yield can be increased with recharge structure
BPS99		Buried Pediplain Shallow (BPS)	3.24 - 6.62 / DW - 8 HP - 2	Limited	WM+FR	DW / TW / BW	5 -10 / 40 - 60	<5 m^3/day / 30 - 50 LPM	Low	P	10%	RP High	Priority of recharge structures is high since yield is low. Dug wells preferred
PPS99		Weathered Pediplain Shallow (PPS)	No wells observed	Poor	FR	DW / TW / BW	5 - 10 / 40 - 60	<5 m^3/day / 20 - 30 LPM	Low	P	Nil	Not Required	Recharge structures not required since there are no settlements in the unit
BJS99		Bajada Shallow (BJS)	No wells observed	Moderate	LS Underlain by WM+FR	DW / TW / BW	10 - 15 / 90 - 100	5 - 10 m^3/day / 50 - 75 LPM	Moderate	P	25%	Not Required	Recharge is moderate. Better yields at greater depths within fractured rock
RH99		Residual Hill (RH)	No wells observed	–	–	–	–	–	–	–	–	–	Run-off zone, not suitable for ground water development

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 / 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 (< 10 METERS)	MODERATE (8 - 20 METERS)	DEEP (> 20 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 (Pediplain, 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)	600

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 / RWS WELL
> 800 LPM	10/70	> 400 m^3 / day	8/15
400 - 800 LPM	10/70	200 - 400 m^3 / day	8/15
200 - 400 LPM	10/70	100 - 200 m^3 / day	8/15
100 - 200 LPM	10/70	50 - 100 m^3 / day	8/15
50 - 100 LPM	10/70	25 - 50 m^3 / day	8/15
30 - 50 LPM	10/70	15 - 25 m^3 / day	8/15
20 - 30 LPM	10/70	10 - 15 m^3 / day	8/15
10 - 20 LPM	10/70	5 - 10 m^3 / day	8/15
< 10 LPM	10/70	< 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
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 : 1322 mm

(Source IMD)

LOCATION INFORMATION

STATE INDEX

DISTRICT INDEX

A-BIRBHUM
B-BARDDHAMAN
D-PURULIA
E-BANKURA
E-PASCHIM MEDINIPUR

BLOCK INDEX

C12 ARSA
C15 BAGHMUNDI
C16 BALARAMPUR
C17 BARABAZAR

MAPSHEET INDEX

73E/15	73I/3	73I/7
73E/16	73I/4	73I/8
73F/13	73J/1	73J/5

© NRSC (ISRO), DEPT. OF SPACE, GOVT. OF INDIA

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

PREPARED BY
GEOINFORMATICS & REMOTE SENSING CELL
W.B. STATE COUNCIL OF SCIENCE AND TECHNOLOGY
DEPARTMENT OF SCIENCE AND TECHNOLOGY
GOVERNMENT OF WEST BENGAL
4TH FLOOR, BIKASH BHAVAN
SALT LAKE, KOLKATA 700 091

TECHNICAL GUIDANCE & QUALITY CHECK
NATIONAL REMOTE SENSING CENTRE
INDIAN SPACE RESEARCH ORGANISATION (ISRO)
DEPT. OF SPACE, GOVT. OF INDIA
BALANAGAR, HYDERABAD - 500 625

PARTICIPATING ORGANIZATIONS
SURVEY OF INDIA
GEOLOGICAL SURVEY OF INDIA
PHED, GOVT. OF WEST BENGAL
STATE WATER INVESTIGATION DIRECTORATE, GOWB
P.S.MAPS (LAND RECORD), GOVT OF WEST BENGAL

METHODOLOGY & PROJECT EXECUTION
NATIONAL REMOTE SENSING CENTRE
INDIAN SPACE RESEARCH ORGANISATION (ISRO)
DEPT. OF SPACE, GOVT. OF INDIA
BALANAGAR, HYDERABAD - 500 625

SPONSORED BY
RAJIV GANDHI NATIONAL DRINKING WATER MISSION
(PHASE III B)
DEPARTMENT OF DRINKING WATER SUPPLY (DDWS)
MINISTRY OF RURAL DEVELOPMENT
GOVERNMENT OF INDIA
NEW DELHI