GROUND WATER PROSPECTS MAP

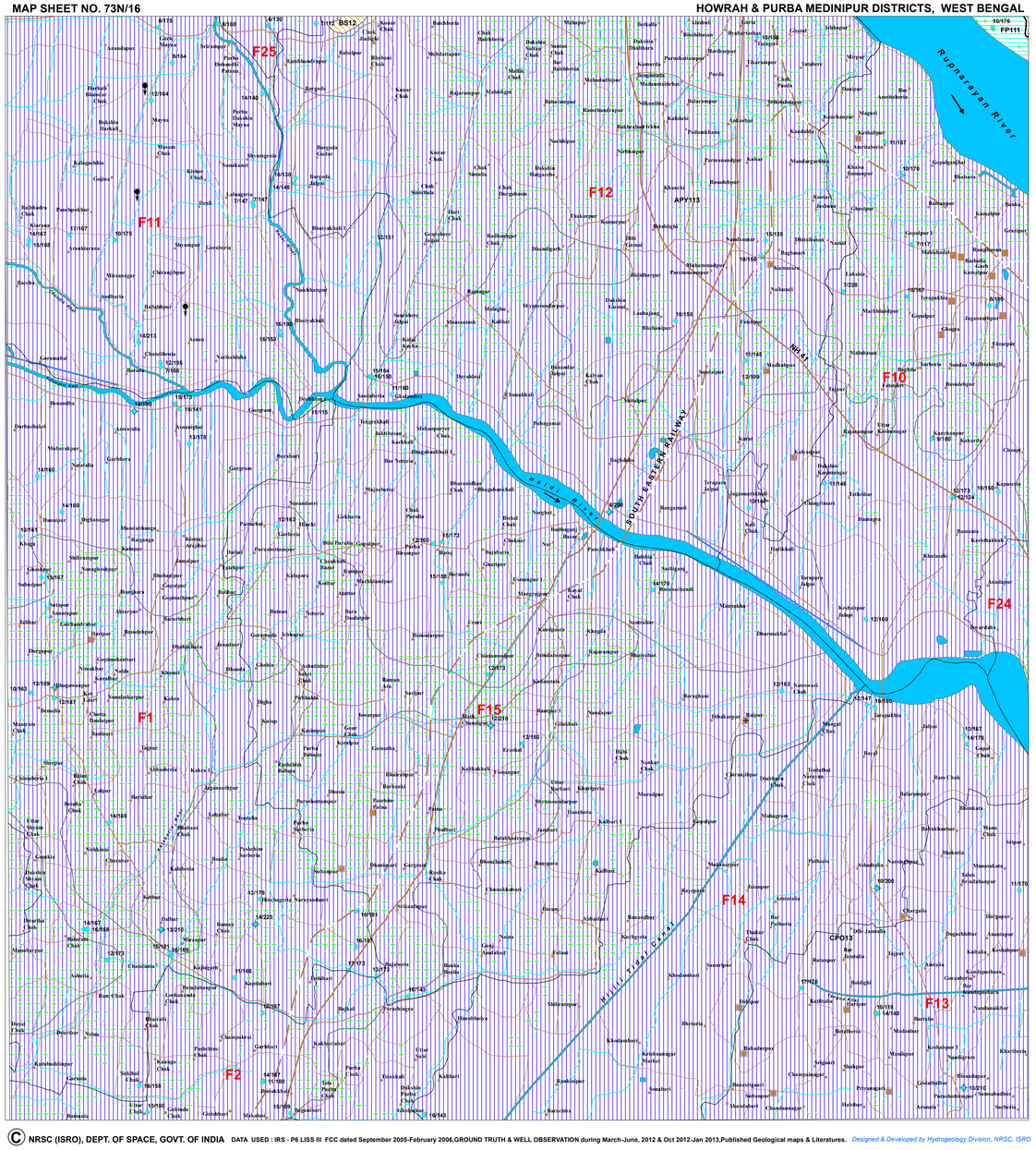
(PREPARED FROM SATELLITE IMAGE INTERPRETATION WITH LIMITED FIELD CHECKS)

Kilometers
0 1 2 3 4 5

SCALE - 1 : 50,000

MAP SHEET NO. 73N/16

HOWRAH & PURBA MEDINIPUR DISTRICTS, WEST BENGAL



© NRSC (ISRO), DEPT. OF SPACE, GOVT. OF INDIA DATA USED : IRS - P6 LISS III FCC dated September 2005-February 2006,GROUND TRUTH & WELL OBSERVATION during March-June, 2012 & Oct 2012-Jan 2013,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						RECHARGE STRUCTURES SUITABLE & PRIORITY	REMARKS (PROBLEMS / LIMITATIONS)
						AQUIFER MATERIAL (LS = LOOSE SEDIMENTS, CS = CONSOLIDATED ROCK, FR = FISSURED ROCK, FR = FRACTURED ROCK, WR = WEATHERED ROCK / WEATHERED MATERIAL, IR = IMPERVIOUS ROCK)	TYPE OF WELLS SUITABLE (DW = DUG WELL, RW = RING WELL, TW = TUBE WELL, DDW = DUG CUM-BORE WELL / DTW = 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 REASON IF NON POTABLE)	GROUND WATER IRRIGATED AREA (APPROX . RANGE IN PERCENTAGE)		
FP111	Hugli/Bhagirathi Formation(Present day Deposits)	Alluvium (Sand Dominant) (111)	Flood Plain (FP)	13 / 6 / 1	Very Good	LS	RW TW	<30 m	400-500 LPM	Very High	P	14	PT = PERCOLATION TANK NB = NALA BUND RW = RECHARGE WELL DT = DESILTING OF TANK RS = RECHARGE SHAFT SD = SUBSURFACE DYKE RS = RECHARGE SHAFT ST = STORAGE TANK SCM = SOIL CONSERVATION MEASURES	Not Required	Groundwater prospects very high with high recharge potential. Recharge structures not required.
FP111			Flood Plain (FP)	16 / 9 / 40	Very Good	LS	TW	<30 m	250-350 LPM	Very High	P	50		RW Low	Groundwater prospects very high with high recharge potential. Recharge structures not required.
BS12	Panskura/Arambagh/Chinsurah/Kalna Formation (Early to Late Holocene)	Alluvium (Clay Dominant) (12)	Backswamp (BS)	No Well Observed	Poor	LS	TW	60-70 m	40-50 LPM	Low	P	Nil		Not Required	Areas of low groundwater potential. Better potential at greater depths.
APY113		Alluvium (Sand and Silt) (113)	Alluvial Plain Younger (APY)	13 / 8 / 19	Good	LS	TW	100-120 m	400-500 LPM	High	NP (Salinity) [At shallow depth]	44		Not Required	Areas affected by saline water intrusion.Fresh water aquifers found at depth ranges of 100 m and above.
CPO13	Ancient Estuarine Deposits (Early to Late Holocene)	Alluvium (Sand,Silt & Clay) (13)	Coastal Plain Older (CPO)	15 / 9 / 19	Good	LS	TW	150-250 m	600-800 LPM	High	NP (Salinity) [At shallow depth]	8		Not Required	Areas affected by saline water intrusion.Fresh water aquifers found at depth ranges of 150m and above.

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 (<30 METERS)	MODERATE (30 - 60 METERS)	DEEP (>60 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	GREY			
Prospects limited to valley portions only (Hills, Pokuras etc.)				
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)	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 / 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
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 : INTERNATIONAL, STATE, DISTRICT, BLOCK

OTHER INFORMATION

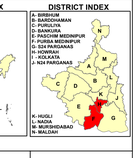
Rainfall :1703 mm

(Source IMD)

LOCATION INFORMATION

STATE INDEX

DISTRICT INDEX



BLOCK INDEX

F1-BHAGABANPUR I
F2-BHAGABANPUR II
F5-BANSKAL
F10-CHANDRAKONA I
F11-RANDIGHIRAI I
F12-RANDIGHIRAI II
F13-KHARAGPUR I
F14-KHARAGPUR II
F15-DEBRA
F16-PINGLA
F18-SABANG
F19-PATASPUR
F20-KANTAI I
F21-KANTAI II
F22-RAMNAGAR I
F23-RAMNAGAR II
F24-EGRA I
F25-EGRA II

MAPSHEET INDEX

73N11	73N15	79B03
73N12	73N16	79B04
73O09	73O13	79C01

PREPARED BY

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GEOLOGICAL SURVEY OF INDIA
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STATE WATER INVESTIGATION DIRECTORATE, GOWB
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