GROUND WATER PROSPECTS MAP

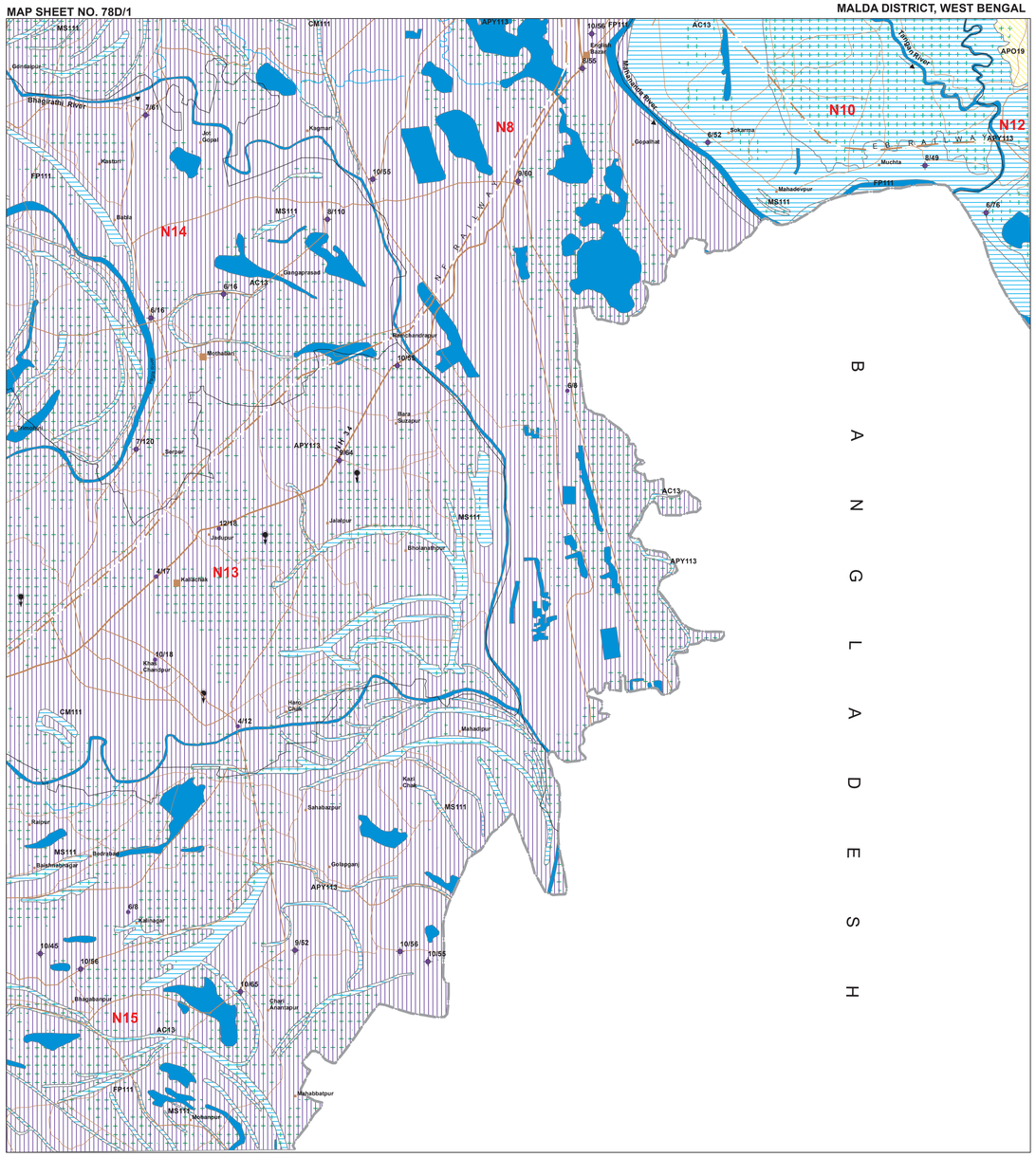
(PREPARED FROM SATELLITE IMAGE INTERPRETATION WITH LIMITED FIELD CHECKS)

0 1 2 3 4 5 Kilometers

SCALE - 1 : 50,000

MAP SHEET NO. 78D/1

MALDA 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)	GROUND WATER PROSPECTS: AQUIFER MATERIAL (LS = LOOSE SEDIMENTS, CR = CONSOLIDATED ROCK, FR = FISSURED ROCK, FR = FRACTURED ROCK, WR = WEATHERED ROCK / WW = WEATHERED MATERIAL, IR = IMPERVIOUS ROCK)	TYPE OF WELLS SUITABLE (DW = DUG WELL, RW = RING WELL, BW = BORE WELL, TW = TUBE WELL, DBW = 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 REASONS IF NON POTABLE)	GROUND WATER IRRIGATED AREA (APPROX. RANGE IN PERCENTAGE)	RECHARGE STRUCTURES SUITABLE & PRIORITY PT = PERCOLATION TANK, NB = NALA BUND, RB = 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)
CM111	Shaugaon Formation/Present Day Deposits (Present Day)	Alluvium (Sand Dominant) (111)	Cut-off Meander (CM)	No Well Observed	Very Good	LS	RW TW	10-15 m	200-300 LPM	Very High	P	10	Not Required	Highly productive shallow aquifers with good recharge.
MS111			Meander Scar (MS)	No Well Observed	Very Good	LS	RW TW	10-15 m	300- 400 LPM	High	P	90	Not Required	Highly productive shallow aquifers with good recharge.
FP111			Flood Plain (FP)	No Well Observed	Very Good	LS	TW	<30 m	250-350 LPM	Very High	P	93	Not Required	Receives good recharge and forms shallow aquifer. Overall quality of the water is potable.
FP111				No Well Observed	Very Good	LS	TW	80-100 m	400- 600 LPM	Very High	NP (As & Fe) (at shallow depth)	55	Not Required	Areas with high concentration of Arsenic & Iron. Potable water available at deeper depth.
APY113	Malda/Jalpaiguri Formation (Early - Late Holocene)	Alluvium (Sand and Silt) (113)	Alluvial Plain Younger (APY)	10 / 6 — 23	Good	LS	TW	25-30 m	200-250 LPM	High	P	10	Not Required	Highly productive aquifer at shallow depth with good recharge.
APY113				7 / 6 — 3	Good	LS	TW	100-120 m	400-500 LPM	High	NP (As & Fe) (at shallow depth)	45	RW Moderate	Areas with high Arsenic & Iron content. Potable water available at deeper depth.Parts of the unit under "Semi-critical" catagory within Kaliachak-I block, recharge structures suggested.
AC13		Alluvium (Sand,Silt & Clay) (13)	Abandoned Channel (AC)	No Well Observed	Excellent to Very Good	LS	RW TW	10-30 m	250-300 LPM	Very High	P	Nil	Not Required	Highly productive shallow aquifers with good recharge from base flow.
APO19	Barind Formation (Lt. Pleistocene)	Alluvium (Silt Dominant) (Caliche & Fe-Nodules Bearing) (19)	Alluvial Plain Older (APO)	No Well Observed	Moderate	LS	TW	50-60 m	75 - 100 LPM	Moderate	P	5	Not Required	Shallow aquitards form due to clayey sediments.Aquifers occur at modarate depth.

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 - 100 METERS)	DEEP (>100 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 fill/ Lineaments (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		CHECK DAM	
NALA BUND		RECHARGE WELL	
DESILTING OF TANK		RECHARGE PIT	
SUBSURFACE DYKE		RECHARGE SHAFT	
SOIL CONSERVATION MEASURES		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	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- 34	NATIONAL HIGHWAY
SH	STATE HIGHWAY
	METALLED ROAD
	OTHER ROAD
	RAILWAY
	CITY / VILLAGE
	HABITATIONS : NON - COVERED (NC) PARTIALLY COVERED (PC)

BOUNDARY : INTERNATIONAL; STATE; DISTRICT; BLOCK

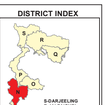
OTHER INFORMATION

Rainfall : 1423 mm
Nearest Rain gauge Station : Malda (Source IMD)

LOCATION INFORMATION

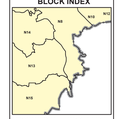
STATE INDEX

DISTRICT INDEX



S-DARJEELING
R-JALPAIGURI
Q-KOCH BIHAR
P-UTTAR DINAJPUR
O-DAKSHIN DINAJPUR
N-MALDA
M-MURSHIDABAD

BLOCK INDEX



N4 - ENGLISH BAZAR
N15 - OLD MALDA
N13 - HABIBPUR
N16 - KALIACHAK I
N14 - KALIACHAK II
N5 - KALIACHAK III

MAPSHEET INDEX

72O16	78C04	78C08
72P13	78D01	78D05
72P14	78D02	78D06

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DATA USED : IRS - P6 LISS III FCC dated February 2009,March 2009 & Nov 2011, GROUND TRUTH & WELL OBSERVATION during February-March 2011, Published GSI & SOI maps.

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