GROUND WATER PROSPECTS MAP

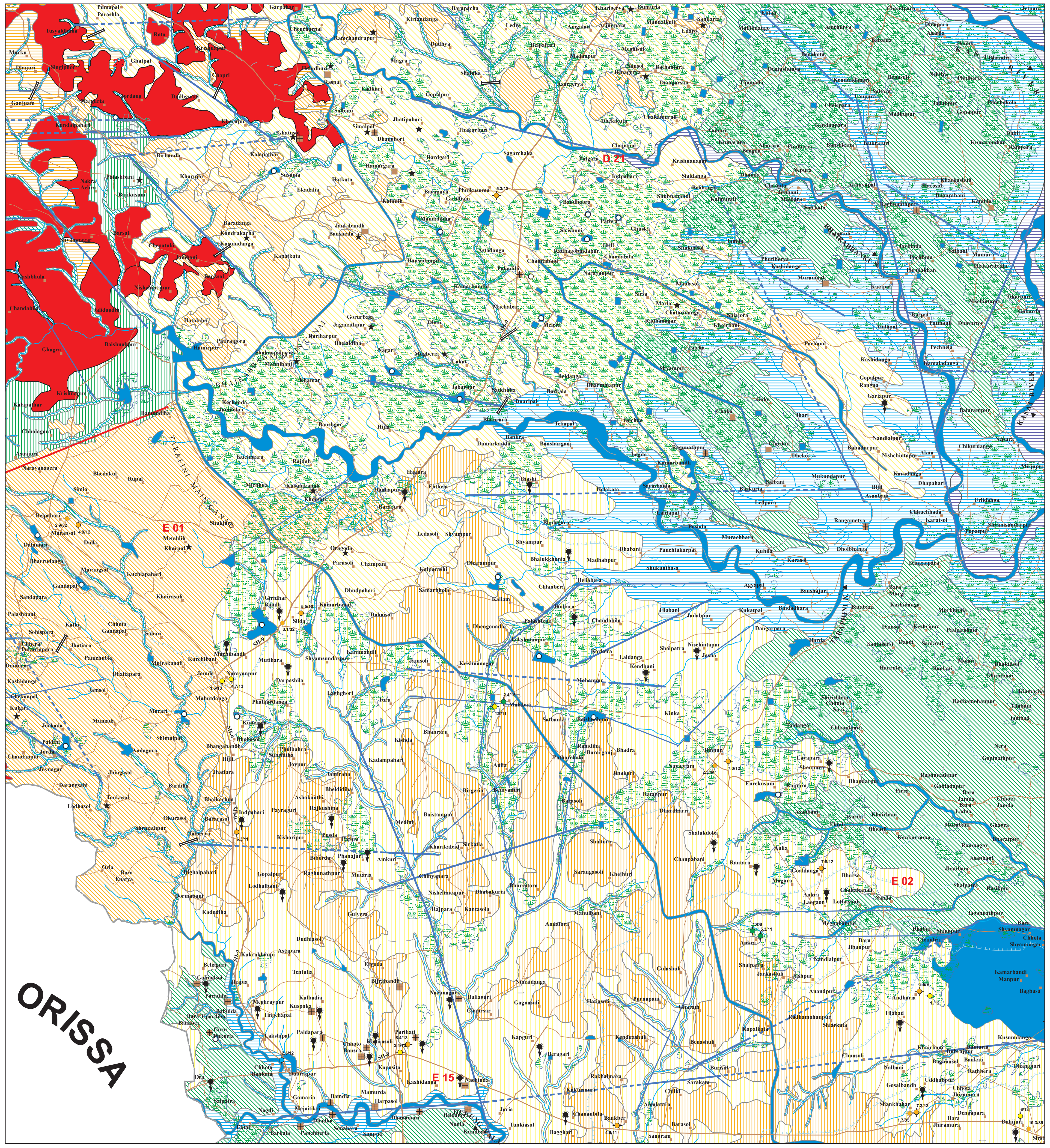
(PREPARED FROM SATELLITE IMAGE INTERPRETATION WITH LIMITED FIELD CHECKS)

Kilometers 0 1 2 3 4 5

SCALE - 1 : 50,000

N / S / E / W

MAP SHEET NO. 73J/14 — **BANKURA AND PASCHIM MEDINIPUR DISTRICTS, WEST BENGAL**



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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.

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, 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 / = 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, 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	Present Day Deposit (Present Day)	Alluvium (Sand Dominant) (111)	Channel Bar (CB)	5 - 6 / 2	Excellant	LS	RW TW	5-10	400-500 LPM	Very High	P	42%	Not Required	Groundwater prospects very high with high recharge potential. Recharge structures not required.
APY113	Arambagh fm (Early - Late Holocene)	Alluvium (Sand and Silt) (113)	Alluvial Plain Younger (APY)	2.5 / DW - 1	Very Good	LS	DW TW	10 - 12 20 - 30	125 - 150 m^3/day 250 - 300 LPM	Very High	P	Nil	Not Required	Aquifer is formed of sandy part of alluvium. Recharge structures are not required as good recharge conditions prevail.
APO13	Sijua fm (Lr. Holocene)	Alluvium (Sand, Silt and Clay) (13)	Alluvial Plain Older (AOM)	2.5 / DW - 1	Good	LS	DW TW	10 - 15 30 - 40	75 - 100 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 conditions prevail.
VFS211	Lalgarh fm ≡ Illambazar fm (Middle to Upper Pleistocene)	Laterite (Ferricrete-hard crust, lateritic nodules and lithomerge clay) (211)	Valley Fill Shallow (VFS)	No wells observed	Moderate	LS Underlain by WM + FR	TW / BW	50 - 60	75 - 100 LPM	Moderate	P	Nil	DT Moderate	Recharge structure will increase the sustainability of ground water resources.
LP211	Lalgarh fm ≡ Illambazar fm (Middle to Upper Pleistocene)	Lithomerge Clay (211)	Lateritic Plain (LP)	1.05 - 8.45 / DW - 12 HP - 4	Limited	WM + FR	DW TW / BW	15 - 20 50 - 60	25 - 50 m^3/day 50 - 100 LPM	Moderate	P	Negligible	RW / DT High	Areas of exposed lithomerge clay. Fracture zones form the aquifer,recharge structure will enhance ground water development.
DLU211	Lalgarh fm ≡ Illambazar fm (Middle to Upper Pleistocene)	Hard crust and Lateritic nodules (211)	Dissected Lateritic Upland (DLU) (Hard crust and lateritic nodules)	3.41 - 6.3 / DW - 3	Poor to limited	IM+IR (Impervious material)	TW / BW	80 - 100	30 - 50 LPM	Low	P	Nil	Not required	Essentially Run-off zone where hard capping is present.Areas of lateritic nodules are recharge zones with deep water table conditions.Primarily forest areas with sparse settlements.Not suitable for large scale development of ground water.
VFS212	Dhalbhum Gravel Beds (Tertiary)	Peebles (Laterised) (212)	Valley Fill Shallow (VFS)	No wells observed	Moderate	LS Underlain by WM + PR	TW/ BW	50 - 60	100 - 150 LPM	Moderate	P	Nil	DT Moderate	Recherge structure will increase sustainability of grund water resources.
LP212	Dhalbhum Gravel Beds (Tertiary)	Peebles (Laterised) (212)	Lateritic Plain (LP)	No wells observed	Limited	WM + PR	TW/ BW	50 - 60	100 - 125 LPM	Moderate	P	Nil	RW High	Recharge wells have high priority as the lithomerge clay layer needs to be penetrated to recharge underlying aquifer formed of weathered material and permeable rock.
DLU212	Dhalbhum Gravel Beds (Tertiary)	Peebles (Laterised) (212)	Dissected Lateritic Upland (DLU)	No wells observed	Poor to limited	IM + PR	TW/ BW	50 - 75	50 - 75 LPM	Low	P	Nil	Not required	Essentially Run-off zone where hard capping is present.Areas of lateritic nodules are recharge zones with deep water table conditions.Primarily forest areas with sparse settlements.Not suitable for large scale development of ground water.
SH81			Structural Hill (SH)	No wells observed	-	-	-	-	-	-	-	-	-	Run-off zone, not suitable for ground water development.
VFS922	Singhbhum Group (Lr.Proterozoic 2300-2400 mill.yrs.)		Valley Fill Shallow (VFS)	No wells observed	Moderate	LS Underlain by WM+FR	TW / BW	30 - 50	100 - 125 LPM	Moderate	P	Nil	Not Required	Small unit,recharge structures not required
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	100 - 125 LPM	Moderate	P	Negligible	CD / DT Moderate	Prospects inferred as no well observed. Recharge condition is moderate with moderate ground water prospects.
BPS923	Unclassified Metamorphics (Older Metamorphics) (Archaean)	Mica Schist (923)	Buried Pediplain Shallow (BPS)	5.34 / DW - 1	Limited	WM + FR	DW TW / BW	5 - 10 40 - 60	5 - 10 m^3/day 50 - 75 LPM	Low	P	Nil	RP / DT High	Recharge structures will improve sustainability of ground water sources.
PPS923	Unclassified Metamorphics (Older Metamorphics) (Archaean)	Mica Schist (923)	Weathered Pediplain Shallow (PPS)	1.65 - 4.9 / DW - 3 HP - 1	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 infiltaration, recharge structures are required to maintain sustainability of ground water sources.
BJS923	Unclassified Metamorphics (Older Metamorphics) (Archaean)	Mica Schist (923)	Bajada Shallow (BJS)	No wells observed	Moderate	LS Underlain by WM + FR	DW TW / BW	10 - 15 90 - 100	10 - 15 m^3/day 100 - 125 LPM	Moderate	P	5%	Not required	Recharge is moderate. Better yields at greater depths within fractured rocks.
HTW923	Unclassified Metamorphics (Older Metamorphics) (Archaean)	Mica Schist (923)	Hill Top Weathered (HTW)	No wells observed	Limited	WM + FR	DW TW / BW	<5 25 - 30	<5 m^3/day 30 - 50 LPM	Low	P	Negligible	Not required	Prospects limited. Better prospects along fracture zones.Very sparse settlements
RH923	Unclassified Metamorphics (Older Metamorphics) (Archaean)	Mica Schist (923)	Residual Hill (RH)	No wells observed	-	-	-	-	-	-	-	-	-	Run-off zone, not suitable for ground water development.
DHM923	Unclassified Metamorphics (Older Metamorphics) (Archaean)	Mica Schist (923)	Denudational Hill/ Moderately dissected (DHM)	No wells observed	-	-	-	-	-	-	-	-	-	Run-off zone, not suitable for ground water development.
SH923	Unclassified Metamorphics (Older Metamorphics) (Archaean)	Mica Schist (923)	Structural Hill (SH)	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 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		(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	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; PEGMATITIE 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

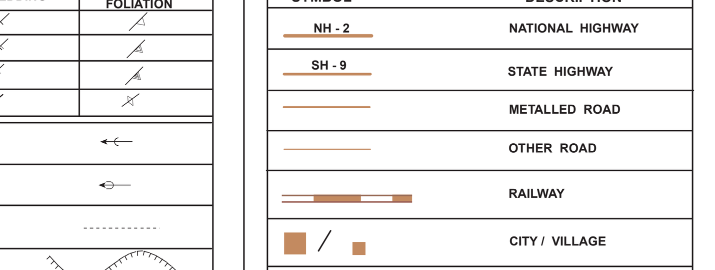
OTHER INFORMATION

Rainfall : 1542mm

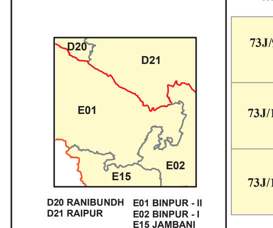
(Source IMD)

LOCATION INFORMATION

STATE INDEX / DISTRICT INDEX



BLOCK INDEX / MAPSHEET INDEX



73J/9	73J/13	73N/1
73J/10	73J/14	73N/2
73J/11	73J/15	73N/3

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