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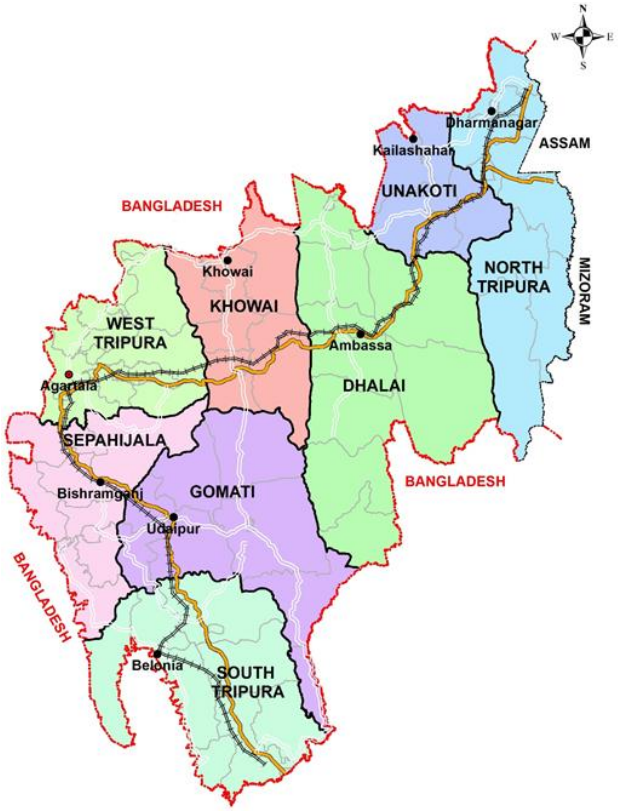
भूमि जल अन्वेषण रिपोर्ट, त्रिपुरा
GROUND WATER EXPLORATION REPORT, TRIPURA



भारत सरकार
GOVERNMENT OF INDIA
जल शक्ति मंत्रालय
MINISTRY OF JAL SHAKTI
जल संसाधन, नदी विकास और गंगा संरक्षण विभाग
DEPARTMENT OF WATER RESOURCES, RD & GR
केंद्रीय भूमिजल बोर्ड
CENTRAL GROUND WATER BOARD
उत्तर पूर्वी क्षेत्र, गुवाहाटी
NORTH EASTERN REGION, GUWAHATI

मार्च, २०२३ / March, 2023

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GROUND WATER EXPLORATION REPORT, TRIPURA

Compiled and prepared by

Ritu K. Oraon

SCIENTIST- C

H. V. Sophia Kay

SCIENTIST- C

Rupam Chattaraj

ASST HYDROGEOLOGIST

Dr. Raja Ram Purohit

SCIENTIST- D

राज्य एकक कार्यालय, अगरतला, त्रिपुरा
STATE UNIT OFFICE, AGARTALA, TRIPURA

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ABBREVIATION

AAP	Annual Action Plan
CGWB	Central Ground Water Board
NER	North Eastern Region
NAQUIM	National Aquifer Mapping and Management Plan
GL	Ground Level
LPM	Litres per minute
LPS	Litres per second
GSI	Geological Survey of India
m	Metre
mbgl	Meters below ground level
MCM	Million Cubic Meter
Mm	Milli meter
mg/l	milligram/litre
m amsl	Metre above mean sea level
Sq.Km	Square Kilometre
µS/cm	Microsiemens/centimetre
BIS	Bureau of Indian Standards
BDL	Below detectable level
BCM	Billion Cubic Metres
DTW	Depth to water table
DW	Dug Well
BW	Bore well
EC	Electrical Conductivity
EW	Exploratory Well
GEC	Ground water Estimation Commitee
Ha	Hectare
Ham	Hectare meter
Km	Kilometer
MP	Measuring Point
OW	Observation Well
°C	Degree Celsius
Ppm	Parts per million equivalents to mg/l
Pz	Piezometer
SWL	Static water level
TDS	Total dissolved solid
GWMW	Ground water monitoring well
PWD (WR)	Public Work Department (Water Resources)
PWD (DWS)	Public Work Department (Drinking Water & Sanitation)

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EXECUTIVE SUMMARY

Tripura is the third smallest state in Indian Union covering an area of 10,491.69 sq.km. It is situated between North Latitudes 22°56' to 24°32' and East Longitudes 91°09' to 92°20'. Tropic of cancer passes through the southern part of the state. It is a land-locked state and bounded by Bangladesh on the west, south and north. It's North-eastern and eastern boundary is demarcated by Assam and Mizoram respectively. The length of its international border with Bangladesh is 856 Km (84%) while it shares 53 Km border with Assam and 109 km border with Mizoram.

Administratively Tripura is divided into eight districts viz., West Tripura, Khowai, Sepahijala, South Tripura, Gomati, Dhalai, North Tripura and Unakoti with their headquarters at Agartala, Khowai, Bishalgarh, Belonia, Udaipur, Ambassa, Dharamnagar and Kailashahar respectively. Agartala city is the state capital. The Eight districts are further subdivided into 23 sub divisions and 58 blocks. Tripura also has an autonomous tribal council, the Tripura Tribal Areas Autonomous District Council (TTAADC) with its head quarters at Khumlung. The TTAADC covers about two third of the area (7132.56 sq.km). The total number of Gram Panchayats is 1178, which includes 587 Autonomous District Council (ADC) villeges. The National Highway No 8 (earlier known as NH-44), known as Agartala-Assam road is the only road link with the rest of India. Silchar – Agartala meter gauge railway line passes through the state. Agartala the state capital is connected with other parts of the country by air.

The state is characterized by warm and humid sub-tropical climate with three distinct seasons such as summer, rainy and winter. Winter is followed by a brief spell of spring. The average annual rainfall is more than 1911 mm in most part of the state.

There are as many as 10 rivers which originate in the hill ranges and flow either in a northerly or westerly direction through the narrow valleys draining the state. The Khowai, Manu, Deo, Juri, Dhalai and Longai rivers are characterized by northerly flow the Gomti, Haora, Muhuri, Burigang rivers flow westward into Bangladesh territory. The Gomti is the biggest river and Manu is the longest river of the state. A significant feature of the rivers is that they are perennial in nature and their flows are directly related to rainfall.

The state exposes mainly sediments of the Upper Tertiary age comprising a poorly fossiliferous succession of alternating shales, mudstone, siltstone and sandstone in varying proportions. In addition, extensive sediments of Quaternary age occur as terraced valley fills comprising mainly unconsolidated sand, silt and clays.

There are three hydrogeological units / water bearing formations viz., Tipam Group, , Dupitila formation and Alluvial formation. The Alluvial formation occurs in 10 to 15 m veneer along the banks of main rivers. Groundwater occurs under unconfined condition.

The groundwater development in the area has not been very significant because of high clay and sandy clay content. Groundwater developed through dug wells and ordinary hand pumps. The Dupitila formation occurs nearly horizontal in disposition and its thickness varies from 10 to 30 m. The formation consists of mainly clay and silt with some intercalations of gritty and ferruginous sandstones. It is exposed in the central portion of Kamalpur valley and northern part of Manu valley. In general, it has low permeability and low storage capacity due to high clay content. Groundwater is developed through dug wells and hand pumps. Sandstone of Tipam formation constitutes principal aquifer. The permeability of this sandstone is much higher than that of Dupitila sandstone or Surma sandstone. The recharge area of the sandstone is in the anticlinal hills. This formation consists of sub-rounded, fine to medium grained, friable sandstone with intercalated clay. Groundwater occurs under semi-confined to confined conditions. This formation is developed by heavy-duty deep tubewells, mini deep tubewells and MKII/III tubewells.

Groundwater exploration was commenced in the state as early as 1976 and continued till 2018. Under Groundwater Exploration programme CGWB has constructed 102 wells in 76 locations (65 Exploratory Wells (EW), 26 Observation Well (OW), 2 Slim Holes (SH) & 9 Deposit Wells) in the state down to the maximum depth of 300 m. The density of wells is 1 exploratory well for every 140 sq.km. However, the density of wells is not uniform throughout the state. Groundwater exploration has revealed the presence of high concentration of iron in groundwater in most of the places. The maximum iron concentration of 21 mg/lit was found in EW at Panisagar, North Tripura district. Other chemical constituents are very much within permissible limits for drinking and irrigation purposes set by BIS.

Ground water in the area is developed through deep tubewells, mini deep tubewells, shallow tubewells, dug wells and artesian wells. The results of exploration indicates that the deep tube wells constructed to the depth of around 250 m by tapping 40-60 m granular zone can yield about 30 to 100 m^3/hr for a drawdown up to 15 m, and at hydrogeologically favourable locations auto flow conditions occurred.

Groundwater conditions further revealed the presence of four to six potential aquifers in the state in addition to phreatic aquifer and existence of auto flow conditions in both shallow and deeper aquifers. The biggest artesian zone extending from Teliamura to Khowai on either sides of Khowai river, and on either side of Dhalai river having alternating sandstone and shale layers. The yield of the auto flow is as high as 10 lps in Khowai and Singicherra villages.

There is large scope for further ground water development in the state. Large number of deep and shallow tube wells can be constructed in the state with space norms of 500 m for deep tube wells and 150 m for shallow tube wells.

1. INTRODUCTION

1.1 LOCATION:

The state of Tripura is situated in the north-eastern part of India and it is the third smallest state of the country covering an area of 10,491.69 sq.km. The erstwhile princely state of Tripura merged with the Union of India after independence on the 15th October, 1949 as Group-C category state. Then it became a Union Territory on 1st July 1963. Finally, Tripura emerged as a full-fledged state on the 21st January 1972. It is situated between North Latitudes 22°56' to 24°32' and East Longitudes 91°09' to 92°20'. Tropic of cancer passes through the small hemlet named Garjee (near Udaipur city), South Tripura district. It is a land-locked state and bounded by Bangladesh on the west, south and north. Its North-eastern and eastern boundary is demarcated by Assam and Mizoram respectively. The length of its international border with Bangladesh is 856 Km (84%) while it shares 53 km border with Assam and 109 km border with Mizoram.

The state is endowed with considerable natural resources such as fertile soil, well-distributed rainfall, rich flora and fauna, natural gas and abundant water resources. Moreover, the state has vast human resources with present literacy rate of 87.22 % (Male – 91.53 % & Female – 82.73 %) which issignificantly higher than the all India rate of literacy (74.04 %). Most significant is that a thumping 85.58 % of the rural population of the state is literate (Rural Male – 90.86 % & Rural Female – 80.06 %), which is much higher than the all India rural literacy rate (67.8%) and 5th highest in India after Kerala (94 %), Lakshadweep (91.80%), Mizoram (91.30 %), and Goa (88.70). In terms of area, it is the smallest state in the north-eastern region and third smallest state in the country after Goa andSikkim. The Census 2011 data reveals that Tripura is the second most populated state in the north-east after Assam with density of 350 persons per sq. km.

1.2 ADMINISTRATIVE DIVISIONS:

Administratively Tripura is divided into eight districts viz., North Tripura, Unakoti, Dhalai, Khowai, West Tripura, Sepahijala, Gomati and South Tripura with their headquarters at Dharmnagar, Kailasahar, Ambassa, Khowai, Agartala, Bishramganj, Udaipur and Belonia respectively. Agartala city is the state capital. The eight districts are further sub-divided into 23 sub-divisions and 58 blocks. Tripura has one Autonomous District Council, the Tripura Tribal Areas Autonomous District Council (TTAADC), which has its headquarter at Khumulwng, 23 kms away from Agartala city. The TTAADC covers about two third of the state's area (7132.56 sq. km.). The 3 tier Panchayat Raj System is prevalent in the state. There are 8 Zilla Parishads and 23 Panchayat Samitis. The total number of Gram Panchayats/ADC Village Councils is 1178, which includes 587 Autonomous District Council (ADC) and 591 elected Gram Panchayats functioning outside the Autonomous District Council areas. The details of administrative divisions have been given in Table 1.1, whereas the Administrative Map of Tripura has been presented in Figure 1.1.

Table 1.1: Administrative Divisions of the State of Tripura

New District	Area (km^2)	Sub-Division	Block	GP	ADC	Revenue Village	Old District
1. North Tripura district (H.Q : Dharmanagar	1444.5 (km^2)	a) Dharmanagar b) Kanchanpur, c) Panisagar	1. Kadamtala, 2. Panisagar, 3. Damcherra 4. Jubaraj nagar, 5. Dasda, 6. Jampui Hills 7. Laljuri, 8. Kalacherra	70	60	89	North Tripura
2. Unakoti district (HQ : Kailashahar)	591.93	a) Kumarghat, b) Kailashahar	1. Gaurnagar, 2. Kumarghat 3. Pecharthal, 4. Chandipur	59	32	78	
3. Dhalai district (H.Q : Ambassa)	2405.3	a) Ambassa, b) Kamalpur c) Gandacherra d) Longtarai Valley	1. Salema, 2. Manu, 3. Ambassa 4. Chhamanu, 5. Dumburnagar 6. Raisabari, 7. Ganganagar 8. Durga-Chowmuhani	41	110	154	Dhalai
4. Khowai district (H.Q : Khowai)	1005.7	a) Khowai b) Teliamura	1. Khowai, 2. Tulashikhar, 3. Padmabil, 4. Teliamura, 5.Kalyanpur, 6. Mungiakami	54	69	79	West Tripura
5. West Tripura district (H.Q : Agartala)	942.55	a) Sadar b) Mohanpur c) Jirania	1. Dukli, 2. Mohanpur, 3.Lefunga 4. Hezamara, 5. Jirania, 6. Mandai 7. Old Agartala, 8. Belbari, 9. Bamutia	87	85	98	
6. Sepahijala district (HQ: Bishramganj)	1044.8	a) Bishalgarh b) Sonamura c) Jampuijala	1. Jampuijala, 2. Bishalgarh, 3. Boxnagar 4. Melaghar, 5. Kathalia, 6. Charilam 7. Nalchar	111	58	119	
7. Gomati district (H.Q : Udaipur)	1522.8	a) Udaipur, b) Amarpur c) Karbook	1. Matabari, 2. Tepaniya, 3. Kakraban, 4. Killa, 5. Amarpur, 6. Ompi, 7. Karbook 8. Silachari	70	103	132	South Tripura
8. South Tripura district (H.Q : Bilonia)	1534.2	a) Santirbazar b) Belonia c) Sabroom	1. Bogafa, 2. Jolaibari, 3. Hrishyamukh 4. Rajnagar, 5. Bharatchandra Nagar 6. Satchand, 7. Poyangbari, 8. Rupaichari	99	70	138	
Total Districts = 8	**10492**	**Sub-Divisions = 23**	**Blocks = 58**	**591**	**587**	**887**	

1.3 DEMOGRAPHY:

The state now has a total population of 36,73,917 persons (Male – 18,74,376 & Female – 17,99,541) as per Census 2011; out of which 27,12,464 is rural population, which constitutes 74 % of the total population and 9,61,453 persons are under urban population, which is 26 % of the total population (Table 1.2). West Tripura district is the most populous district which constitutes about 24.99% (9,18,200 persons) of the total population of the state with population density of 973 persons/sq. km (Table 1.2). Unakoti district has the minimum population of 2,76,506, with population density of 157 persons/sq. km. The density of population for the whole state is 350 persons/sq. km, whereas in 2001 the density was 305 persons/sq. km. The percentage of decadal variation for the period 1991-2001 was 15.68 %, which indicate a sharp decline from that (34.30 %)

of period 1981-91 (Table 1.2). Percentage of decadal variation for the last decade i.e. 2001-11 is found to be 14.84 %. Current population details of the state has been presented in Table 1.2 (2011 census).

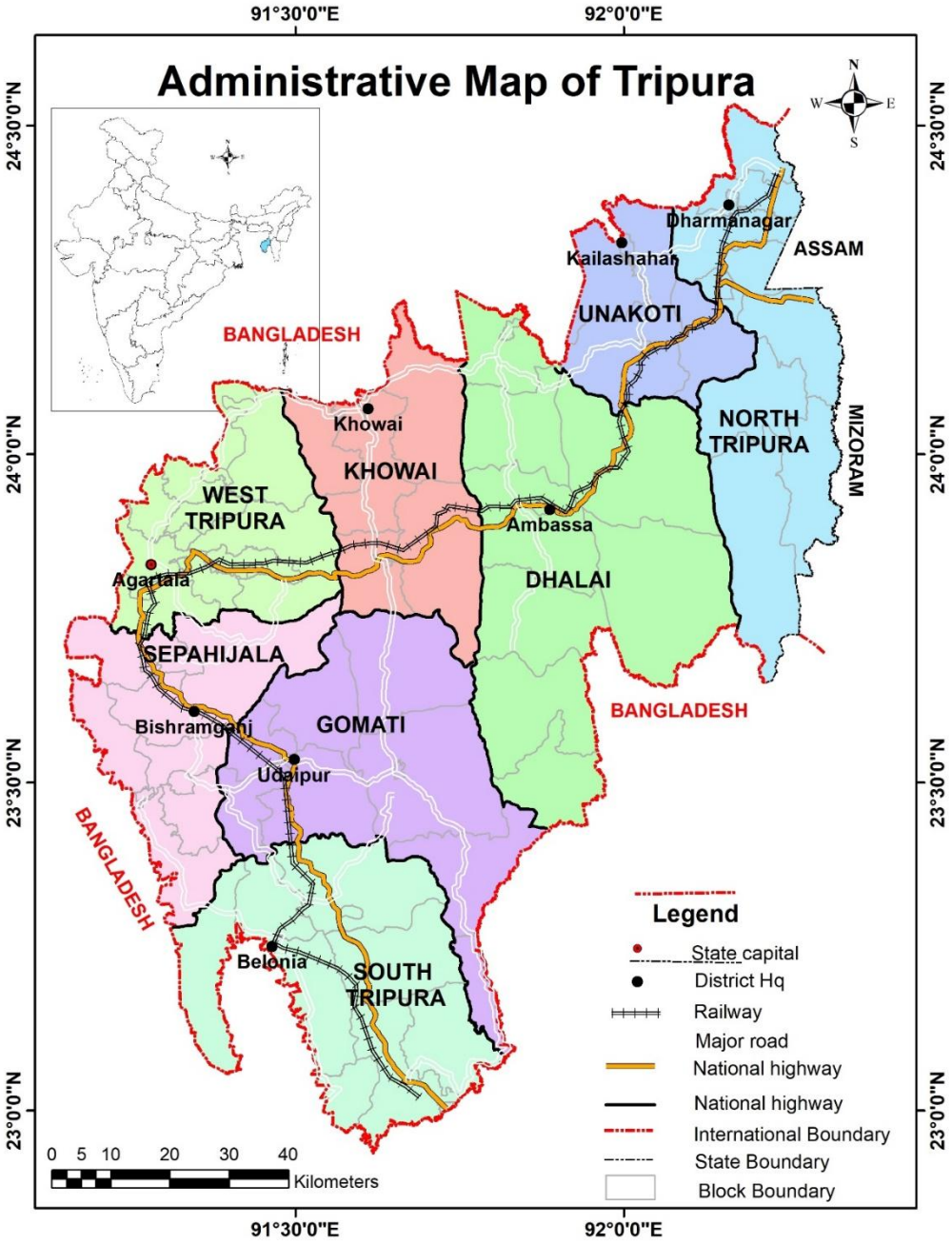


Figure 1.1: Administrative Map of Tripura

There are 19 Scheduled Tribe communities with a total population of 11,66,813 which comprises 31.76 % of the state's total population. 17.82% of the total population of the state of Tripura comes under Scheduled Caste category, which is amounting to be 6,54,918 persons.

Table 1.2: District-wise Population (Census 2011)

District/ Sub-Division	Total Population			Rural		Urban		Percentage of decadal growth		Density per sq. km.	
	Person	Male	Female	Male	Female	Male	Female	1991-01	2001-11	2001	2011
West Tripura	918200	466152	452048	535911	511434	342019	335255	18.48	12.88	862	973
Khowai	327564	167401	160163						11.51	292	326
Sepahijala	483687	247829	235858						12.48	412	463
Dhalai	378230	194544	183686	173599	163914	20743	19732	10.96	22.776	128	157
North Tripura	417441	212650	204791	291577	281477	60894	59333	26.49	13.65	249	288
Unakoti	276506	140210	136296						19.66	392	469
Gomati	441538	225428	216110	384418	367721	62706	60299	6.78	13.348	253	287
South Tripura	430751	220162	210589						14.726	251	283
TRIPURA	**3673917**	**1874376**	**1799541**	**1385505**	**1324546**	**486362**	**474619**	**15.68**	**14.84**	**305**	**350**

Table 1.3 : Decadal population Variation

Year	Total Population	Percentage of Decadal variation
1874-75	74,523	-
1881	95,637	23.83
1891	1,37,575	43.85
1901	1,73,325	25.98
1911	2,29,613	32.48
1921	3,04,437	32.59
1931	3,82,450	25.63
1941	5,13,010	34.14
1951	6,45,707	24.56
1961	11,42,005	78.71
1971	15,56,342	36.28
1981	20,53,058	31.92
1991	27,57,205	34.30
2001	31,99,203	16.03
2011	36,73917	14.75
2019-20	40,12,000	Estimated as per Tripura at a Glace, 2021-22

The above Table 1.3 shows the variation of population of Tripura 1874-75 to 2001 census. The above Figures indicate the total population within a century has increased more than 20 times. The decadal growth rates show fluctuations. During the decade 1951-61, there was large scale migration of people from Bangladesh to Tripura and hence very high growth rate evidenced during that decade.

There are 19 tribal communities comprising 31 percent of the state population. Tripuri, REANG, Jamatia, Chakma, Hlam, Mog Munda/Kaur, Kuki and Garo are most dominant tribal communities in the state.

1.4 SOIL

The soils of the state of Tripura can be classified into two major groups based on their origin, namely residual soil and transported soil or alluvial soil. Each group of soils consists of association of several taxonomic units, which are developed in different phases of the landscape. Soils in the state are generally acidic in nature, contains low nitrogen and phosphate, medium to high available potash and deficient of calcium, magnesium and sulfur.

The humid tropical monsoon climate has given rise to many groups of soils. Based on LANDSAT Imagery (1986) and Atlas of Agricultural Resources of India (Das Gupta, 1980) the soils of the state have been classified into five board groups, i.e. (i) Reddish yellow-brown sandy soils, (ii) Red loam and sandy loam soils, (iii) Older alluvial soils, (iv)Younger alluvial soils and (v) Lateritic soils. The distribution of soils is shown in Figure 1.2A &B and the details are given in Table 1.4. The detailed descriptions of each group of soils are given as follows:

(i) Reddish yellow brown Sandy soil: Reddish yellow-brown sandy soils are extensively residual in nature occurring on the north-south oriented hill ranges and other upland areas of Tripura, crowned with the lush evergreen tropical forests and near inter-montane valleys. Nearly 33% of thegeographical area of the state is covered with the reddish yellow brown sandy soils. This soils occurring in ridge tops and sloping flanks of the hill ranges, are highly susceptible to erosion. Due to continuous erosion and chemical weathering of the bed rock, the finer fractions of the soil mantle have been leached down to the lower horizons of the soil profile, leaving the epipedon littered with a layer of coarse silty or fine sandy material of reddish brown hue. The surface colour of these soils is usually found to be yellowish brown to dark brown. Taxonomically, the reddish yellow brown sandy soils are alfisol (mainly ultic) mixed with erosion-affected Inceptisols. As a result of continuous leaching under heavy rainfall conditions, these soils are rather poor in nutrients.

(ii) Red loam and Sandy loam soil: The red loam and sandy loam soils are the most extensive formation, covering about 43 % of the total geographical area of the state. Genetically, the red loam and sandy loam soils are associated with the intermountain valleys and the forest cover of undulatinguplands. These soils are largely of residual nature are generated under forest environment. Taxonomically, they are fairly mature soils, can be classified as Alfisols comprising association of Ultic Hapludalfs and Typic Paleudalfs.

These red soils are fairly rich in nutrients. They are susceptible to heavy erosion under heavy rainfall condition; especially those located on sloping grounds. There are as many as 14 soil series in this particular group.

(iii) Older alluvial soil: Older alluvial soils, though of recent origin are fairly matured soils of transported in nature. These soils cover nearly 10 % area of the state occurring on river terraces and high plains. They are fairly rich in nutrients and are subject to gully erosion. At least five soil series have been identified in this group.

In the high plains, the profiles of the older alluvial soils are usually well developed and these soils are taxonomically branded as Alfisols (Type Ochraqualfs) though at places are associated with rather immature Inceptisols (Typic Haplaquepts). Due to chemical weathering of some of older alluvial belt, lithomargic ocher has been deposited in the lower part of soil horizon.

(iv) Younger alluvial soil: Younger alluvial soils are mainly confined to flood plains of rivers and cover only 9 % of the total area of the state. These soils usually comprise clay loams and loams and belong to the Entisol group. Taxonomically, the soils can be classified as Typic Udifluvents. These soils are extremely rich in nutrients and are capable to yield assured harvest of rice and jute. However, they are liable to erosion by lateral cutting and bank collapse.

(v) Lateritic soil: There are some Moorish uplands with Lateritic soils confined close to the western boundary of the state mostly south of Sonamura, which cover only 5% of state's total area.

Lateritic soils are of residual in nature and are extremely poor for agricultural activities. The water soluble materials occurring in the bed rocks having been washed down to the lower horizon of the soil profile, the upper part is then left with a suff which comprises the lateritic soils. The texture of the lateritic soils is coarse and the soils are extremely poor in nutrients. Such soil supports tolerably good vegetal cover, which usually consists of grasses, scrub and bushes. Taxonomically, the lateritic soils are Ulticols, consisting largely of Typic Palehumults.

Table 1.4: Soil types of Tripura

Sl. No.	Soil Group	Area		Soil taxonomic unit	Occurrence
		Sq. Km.	Percent		
1	Reddish yellow brown sandy soils	3,468	33.06	(i) Ultic Hapludafs	Hill ranges
				(ii) Udic Ustochrepts	
				(iii) Typic Udorthents	
2	Red loam and sandy loam soils	4,514	43.07	(i) Ultic Haplustalfs	Intermontane valleys and forest covered undulating lands
				(ii) Typic/Ultic Hapludalfs	
				(iii) Typic Paleudalfs	
				(iv) Typic Ustochrepts	
				(v) Typic Drystochrepts	
				(vi) Udic Ustochrepts	
				(vii) Typic Ustochrepts	
3	Older Alluvial soils	1,019	9.71	(i) Typic Ochraqualfs	River terraces and high plains
				(ii) Typic Haplaquepts	
4	Younger Alluvial soils	980	9.34	(i) Typic Udifluvents	Flood plains of streams
5	Lateritic soils	510	4.86	(i) Typic Palehumults	Western boundary of the state
				(ii) Typic Plinthustults	
				(iii) Typic Plinthudults	
				(iv) Typic Paleudults	

A number of micro watershed projects both in the rain fed areas and in shifting cultivation areas are being implemented all over the state in order to minimize the hazards of soil erosion and to maintain soil health for increased cultivation of different crops. The essential components of these projects are treatment of arable and non-arable land according to the capability following the principles of soil and water conservations.

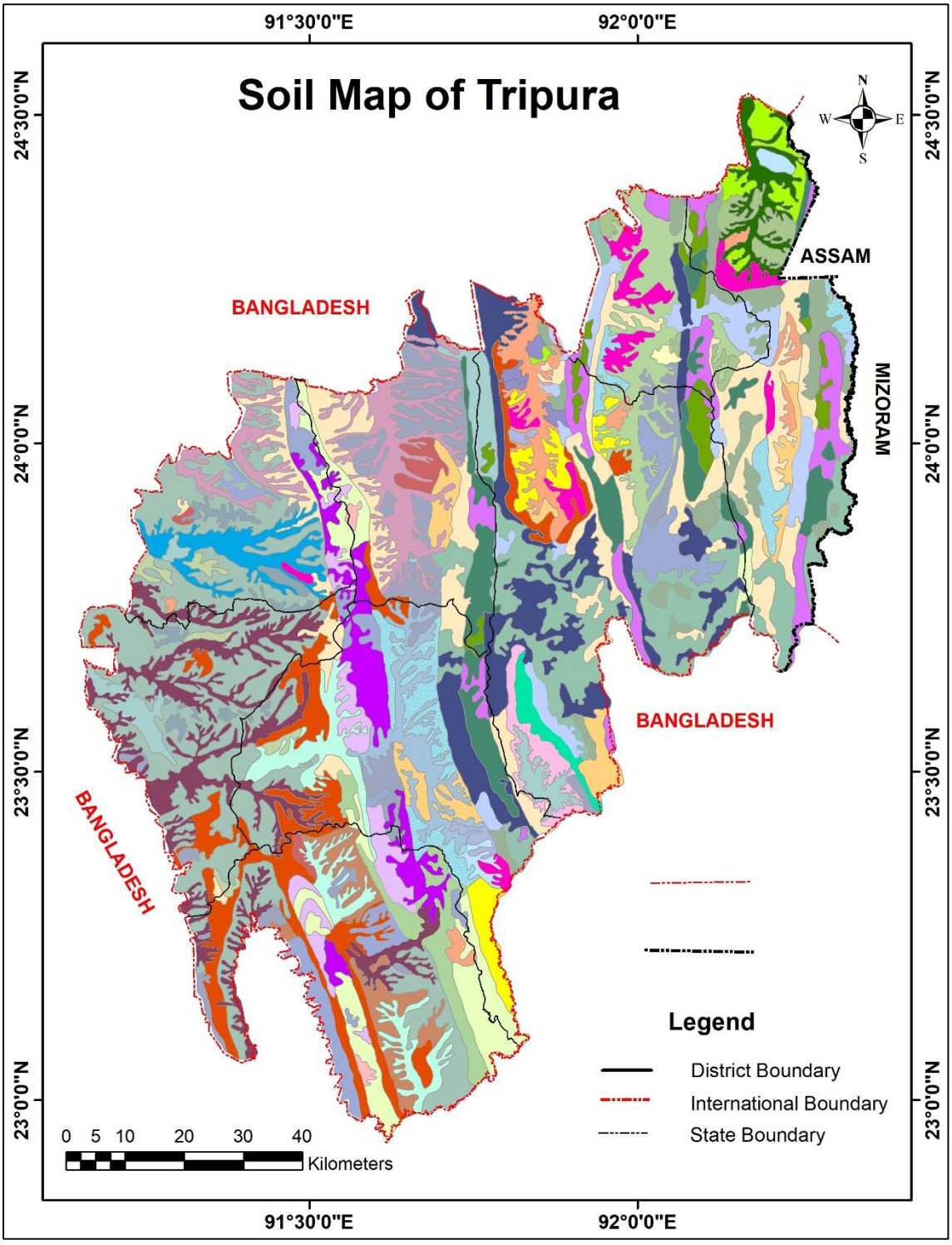


Figure 1.2 A: Distribution of different types of Soils in the state of Tripura

Figure 1.2 B: Index Map of the Distribution of different types of Soils in the state of Tripura

2. HYDROMETEOROLOGY

2.1 CLIMATE:

The climate of the state istropical, highly humid and characterized by moderate temperature with three prominent seasons - summer, monsoon and winter, where summer spans from March to May followed by southwest monsoon lasting till September. Winter season starts in November and lasts till the end of February and is marked with pleasant days & cold nights followed by a brief spell of spring.

The climate warms up generally from the middle of March and the height of summer is reached during the period from April to May. During this period maximum temperature is generally recorded above 35^0C and the minimum temperature from 21.3^0C to 22.4^0C. Generally, the maximum summer temperature ranges from 35^0–40^0C. Monsoon usually breaks in last week of May or in the first week of June and retreats by the end of September or October. Winter sets in from November and becomes severe in January when average minimum temperature at night is recorded as 8^0C.

Humidity generally remains high throughout the year. Generally, it is high in July and low in March. Relative humidity in a year generally varies from 70% to 85%. In summer, relative humidity varies from 60 to 75% in the morning and from 50 to 60% in the evening. In rainy season, relative humidity remains over 85% in the morning and from 70 to 80% in the evening. Relative humidity recorded at Agartala during a long period in the recent past is 89% to 63% in the morning and 80% to 50% in the evening.

Monthly evaporation varies from 1.6 to 6.9 mm/day (ICAR complex, Lembucherra, West Tripura district). Wind speed varies from 1.0 to 3.8km/hr in winter season and 3.7 to 18.3km/hr in summer and rainy season.

2.2 RAINFALL:

Rainfall occurs under the spell of southwest monsoon and the maximum rainfall is commonly recorded in the month of June and July. The average annual rainfall for the last 42 years (1977–2018) of the state is 2262 mm. The average nos. of rainy days for last 5 years is 95. Both the maximum rainfall of 4009.5mm (1978) and the minimum rainfall of 1205.6 mm (1994) had been recorded at Agartala. The co-efficient of variation of rainfall ranges from 7– 30%, which suggests a low variability of annual rainfall. Broad patterns and distribution of rainfall is shown in Figure 2.1, which reveals that rainfall increases from SW to NE in the state. The highest rainfall value of 2500mm has a N-S disposition through North Tripura district. The lowest rainfall lies around Udaipur-Amarpur area of Gomati district.

The disposition of isohyets brings out the fact that the amount of rainfall gradually decreases from east to west in the northern part of the state and northward in the western district. The variability in aerial distribution of normal annual rainfall can be understood from the recorded rainfall of the following stations: (1) Dharmanagar - 2493.034 mm; (2) Kailashahar - 2471mm; (3) Kamalpur - 2535 mm; (4) Khowai - 2321 mm; (5) Agartala Sadar - 2203 mm; (6) Sonamura-2199mm; (7) Udaipur- 1906 mm; (8) Amarpur- 1724 mm; (9) Belonia - 2311 mm and (10) Sabrum - 2303 mm. Annual Rainfall of Tripura for the year 2013, as recorded in different stations.

Table 2.1: Average Station wise Rainfall in the State of Tripura

Sl. no	Stations	Monthly rainfall (in mm)												
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1	Kailasahar	3.2	22.5	25.5	197.8	636.3	418.3	173.2	143.1	197.7	97.3	3.4	35.7	1954.0
2	Dharmanagar	0.0	18.6	60.2	208	624.3	490.8	268.8	241.6	248.7	106.3	36.0	20.3	2323.6
3	Kanchanpur	0.0	4.2	75.1	142.6	548.9	719.6	266.5	274.7	150.2	160.1	9.6	24.8	2376.3
4	Kamalpur	22.0	14.2	43.6	300.4	894.0	544.6	174.2	578.0	265.0	130.6	8.2	46.4	3021.2
5	Chawmanu	0.0	2.5	37.5	163.5	472.0	693.2	162.4	262.4	159.5	137.2	29.0	15.5	2134.7
6	Gandacherra	0.0	1.5	18.8	235.5	756.8	676.8	385.2	157.1	67.1	122.1	5.2	9.6	2435.7
7	Khowai	12.4	11.4	79.2	158.4	834.0	511.6	312.0	257.6	98.2	55.8	2.2	33.6	2366.4
8	Teliamura	19.4	9.0	71.0	122.0	676.8	645.6	202.4	186.8	50.0	65.6	25.2	11.6	2085.4
9	Sonamura	0.0	0.0	9.0	205.0	381.2	386.6	184.6	129.4	173.4	38.2	29.4	2.2	1539.0
10	Bishalgarh	0.0	19.2	27.4	240.7	521.2	393.6	169.6	45.2	41.3	17.2	0.0	6.2	1481.6
11	Sadar	0.0	9.1	28.4	172.0	558.0	444.9	215.0	160.7	83.2	46.9	21.0	23.5	1762.7
12	Jirania	0.0	8.2	28.2	149.2	661.6	521.5	202.0	228.7	108.5	53.7	19.0	25.0	2005.6
13	Matabari	0.0	0.5	18.6	271.7	561.5	326.6	249.0	231.8	233.3	47.9	19.2	2.0	1962.1
14	Amarpur	0.0	0.0	36.7	208.9	647.8	433.7	298.9	232.1	51.7	28.5	32.4	6.2	1976.9
15	Belonia	0.0	2.4	5.6	248.8	388.4	484.8	381.0	346.4	114.2	76.2	0.2	6.4	2054.4
16	Sabroom	0.0	0.0	11.0	0.0	480.4	916.2	679.2	340.5	109.6	165.8	10.8	0.0	2713.5
17	Bogafa	0.0	4.2	12.2	215.0	504.4	595.0	344.5	239.6	75.2	68.8	1.6	5.0	2065.5
	Average	**3.4**	**7.5**	**34.6**	**190.6**	**596.9**	**541.4**	**274.6**	**238.6**	**131.0**	**83.4**	**14.8**	**16.1**	**2132.9**

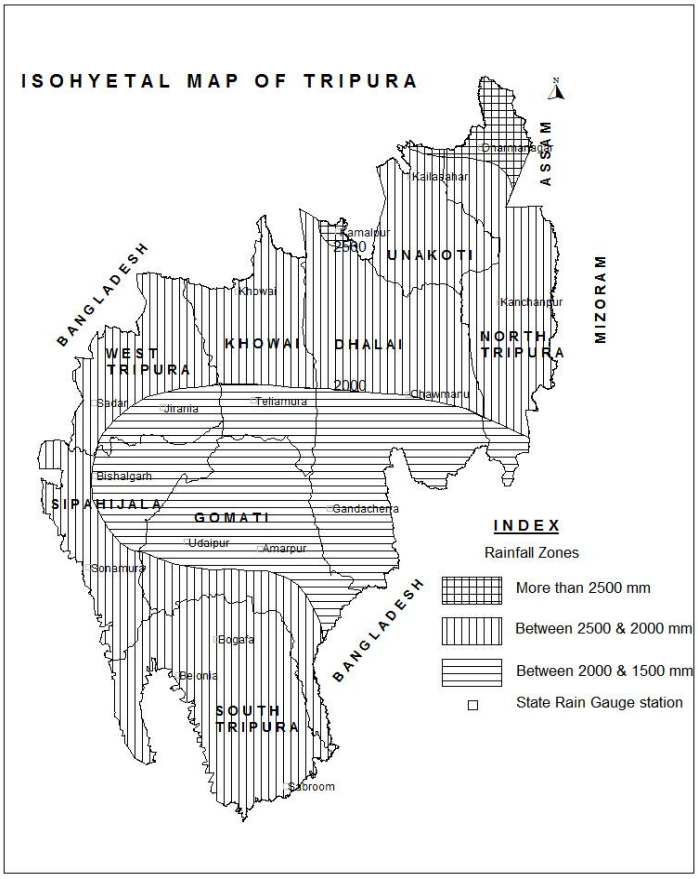


Figure 2.1: Isohyetal Map of Tripura

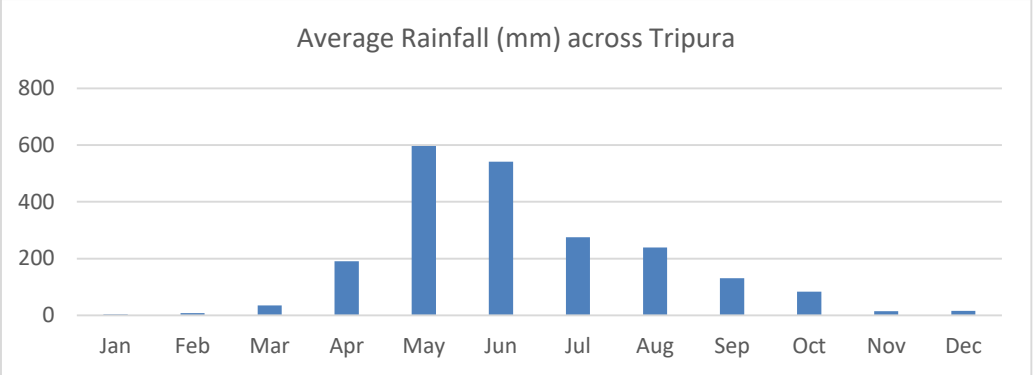


Figure 2.2: Average monthly rainfall pattern in Tripura

2.3 EVAPOTRANSPIRATION:

Seasonal and annual potential evapotranspiration (PET) have been estimated by using Thornthwaite's (1955) empirical formula, making use of the available long term average of monthly minimum and maximum temperature and normal monthly rainfall as recorded at Agartala airport and at other district headquarters. PET is about 50 to 60% of normal rainfall. It is found that PET exceeds for precipitation during five water deficit months i.e. January, February, March, November and December.

3. GEOMORPHOLOGY

3.1 PHYSIOGRAPHY

Physiographically, the state of Tripura consists of hilly terrain with an immature topography, which represents the western fringe of the typical ridge and valley (structural) province of the Late Tertiary fold mountain belt, commonly known as the Indo-Burman Ranges (**Purbachal** Range). The major geographic features are tightly folded anticlinal hill ranges and broad synclinal valleys in between. Five principal hill ranges running parallel in roughly N-S direction, namely (i) the Jampui, (ii) the Sakhantlang, (iii) the Longtarai, (iv) the Atharomura and (v) the Baramura traverse the state from east to west. The altitude of the hill ranges increases progressively form west to east attaining a maximum of 975.36 m above mean sea level (AMSL) at Betling Shib in Jampui hill range, 816.25 m AMSL at Sakhan in the Sakhantlang and 481.83 mAMSL at Phengpur in the Longtarai range. The Atharomura and the Baramura have comparatively lesser elevations of 346 m AMSL and 249 m AMSL respectively. Apart from these major hill ranges, two smaller dome-like ridges namely Sonamura anticline and Agartala dome, which comprise the folded Neogene strata; are lying to the west of Baramura-Deotamura hill ranges. The general altitude of the state varies from 750 m AMSL in the northeastern part to 15 m AMSL in the western part.

There are five broad longitudinal valleys in the state, namely (i) Agartala-Udaipur-Sabroom valley, (ii) Khowai-Teliamura-Amarpur valley, (iii) Kamalpur-Ambassa-Gondacherra valley, (iv) Kailasahar-Kumarghat-Chawmanu valley and (v) Dharmanagar-Panisagar-Kanchanpur valley, located between N-S trending parallel to sub-parallel anticlinal hill ranges. Within the major valley portions, there are numerous isolated hillocks or mounds attaining a height of 20-30 m above the valley floor.

3.1.1 Genetic Classification of Land Systems

Geomorphologically, the state can be defined as a second order morpho-structural land system similar to that of "**Ridge and Valley Province**" of USA. The erosional and depositional units of land system are confined mainly to the structural valleys. Genetic geomorphological map by GSI enables recognition of 17 landform units, which are grouped under these genetic types. Nine Landform units are of structural origin, five units are of denudational origin and the remaining three units are of fluvial origin. All the units can be shown in relation to their bedrock geology and structural pattern.

The units of structural origin characterize the structural pattern of folded rock bodies and include the features, which occur only within the anticlinal hill ranges. On the other hand, units of denudational origin are confined to the structural valleys, where erosional processes predominate, developing an eroded topography, represented by residual hillocks/mounds and an incised net of stream beds. Incised stream beds form the conspicuous geomorphic feature of valley landscape and are partly filled by the alluvial materials derived from adjacent hill slopes. The units of fluvial origin include only the flood plains of major rivers confined to the flat part of structural valleys.

(a) Units of Structural Origin

i. Cores of Sardengmura and Atharamura anticlines represented by a mega hogback are made of Bhuban Sandstone. Units are less dissected and having high relative relief, sharp ridge crest, steep valley side slopes (18).

ii. Along the western flank of both Atharamura and Sardengmura structures, to the immediate west of the above mega hogback unit, linear, parallel strike ridges of Bokabil sandstone constitute the smaller cuesta-hogback unit. This unit shows moderate

dissection and is characterized by the development of short parallel and trellis drainage pattern.

iii. In the Raimachera catchment a discrete structural landform unit occurs between the mega hogback (to the east) and the badland valley (to the west) units. This is characterized by broadly parallel discontinuous low-lying strike ridges of Bokabil silty shale. This unit shows a higher degree of drainage dissection and development of sub-dentriditic drainage pattern.

iv. The eastern flank of Atharamura structure is represented by highly dissected, non-oriented, low-lying discontinuous strike ridges developed in Bokabil sandstone. The drainage pattern is mainly fine dendritic. The discontinuity in ridge structures is due to the effects of transverse faults and fractures. Valley side slope is moderate to steep. Dominant land cover is forest.

v. Eastern flank of Baramura structure is characterized by a narrow zone of fault-guided, sub-parallel step like ridges on Bokabil sandstone. The scarp faces developed on the sides of ridges are highly eroded. Dominant land cover is forest.

vi. The western flank of Baramura structure, on the other hand, is gently sloping and is represented by moderately dissected mega-cuesta like form developed on Bokabil silty shale. Medium dendritic drainage pattern characterizes this unit. Ground slope is moderate. Dominant land cover is forest.

vii. The Maharani-Pitragong basin occurs within the Baramura structure and is characterized by a narrow elongated strike valley which has developed due to raid erosion of the soft Bokabil shale, bordered on both sides by fault scarps.

viii. A moderately dissected linear zone of eroded strike ridge developed on the soft Bokabil sandstone forms the western foothills of Atharomura structure. Ground slope is moderate. Dominant land cover includes forest.

ix. Highly dissected, low-lying elongated domal hills of structural origin occur in the western part of Gomti sub-basin. This unit shows shallow, flat topped anticlinal structures, developed on Bokabil silty shale and has gentle to moderate slope. Fracture controlled streams are more incised with flat channel beds. Dominant land cover is forest.

(b) Units of Denudational Origin:

i. In the upper catchment of the Khowai river sub-basin, to the east of Atharamura range, the soft Bokabil shale forms a unit characterized by intensely dissected badland valley, with the development of sharp crested, non-oriented, small hillocks. Valley side slope varies considerably. Land degradation advances with gully erosion. Dominant land cover includes forest.

ii. Between the Raima and Sarma streams a discrete unit of slightly raised platform within the structural valley is characterized by intensely dissected badland topography. This unit can be traced to the upper catchment of the Khowai sub-basin in the north. It developed on Bokabil silty shale and is intensely traversed by WNW-ESE and NE-SW trending fractures. Ground slope is moderate (5-10). Hill crests are sharp to rounded and the hill side slopes are degraded by gullies. Dominant land cover is forest.

iii. The western foothill zone of Baramura structure shows development of moderately dissected round to sharp crested low-lying denudational hill on Tipam sandstone. Slope varies from gentle to moderate. Hill side is characterized by debris slopes.

iv. Within flat portions of structural valleys, hillocks form a discrete denudational unit on Dupitila formation. Hillock tops show development of lateritic deposits. Dominant land covers are forest and other plantations. Gully and rill erosion predominate.

v. Flat topped, isolated, low residual mounds (locally known as 'tilla') with lateritic caps are seen to form a unit in the valley especially around the major flood plains of rivers. Ground slope is gentle. Sheet and rill erosion predominate. Dominant land covers are settlements and various plantations.

(c) Units of Fluvial Origin:

i. Alluvial flood plains have developed along the present day major river beds. Fluvial forms include point bars, levees and back swamps. The unit serves as the site for seasonal cultivation.

ii. Older alluvial plains on either side of major rivers are restricted in occurrence and form sites for cultivation and rural settlements.

iii. Incised flat stream valleys appear as fossil drainage net. This incised fossil drainage net shows trapezoidal valley form and is ephemeral in nature. Channel slope varies from 0 to 1. Valley side slopes are steep and are unstable because of unconsolidated nature of materials that compose the valley walls. Debris slides are common. Newly formed rill and gullies on the sides of residual mounds join this older incised drainage net and appear as misfit linkage in regards to channel slope and valley forms. Most of the major tributaries in the fossil drainage net are along the fracture lineaments. These infilled valleys, locally known as "lungas", constitute an area for seasonal cultivation.

3.1.2 Terrain Characteristics

Although the seventy percent of land area is hilly, three distinct physiographic zones nevertheless are discernible here. These are (i) N-S oriented hill ranges, (ii) Undulating plateau land and (iii) Low lying alluvial plains. Hydrogeomorphic and structural map of Tripura is furnished in Figure. – 4.1.

Zone - I : **Hill Ranges** : The State is traversed by five major hill ranges with a roughly north-South orientation and separated by narrow valleys. The valleys are by and large 20 km wide. The hill ranges continue southward into Chittagong Hill Tract.The Jampui Hill is the easternmost. The westernmost range is formed by the Baramura-Deotamura Hills. In between these two ranges lie the other three ranges. The Jampui range is successively followed to the west by the Sakhantlang, the Longtarai and the Atharomura.

Zone - II : High Lands and Plateaus : This zone covers extensive areas and marks the western limit of the hilly region. The plateau gradually rises from the west to east with elevation ranging from 15 m to 75 m and merges with the eastern hilly tract. This zone is dissected by medium and narrow valleys, streams and gullys and is severely eroded.

Zone - III : Alluvial Valleys : The elevation of the alluvial valley is restricted within 15 m above. Low lands interspersed by hillocks and swamps are locally called "lunga".

3.1.3 Landforms

There are two fundamentally different landform domains in the State:

A. Neogene Fold Ridges: This constitute the roughly N-S aligned anticlinal ridges with rounded to nearly flat-topped Baramura, Rokia and Sonamura and comparatively more rugged Atharomura with several spurs, comprising sub-flysch and molasses sediments of Mio-Pliocene age.

B. Alluvial Terrain: The terraced alluvial terrain is divisible into three groups on the basis of characteristic relief, slope, degree of dissection, soil character, landform assemblage and nature of alluvial fill. These in chronological order are: (1) the table lands (tilla lands) and rolling mounds formed by the Upper Pleistocene terraces characterized by maximum dissection, drainage density and weathering, (2) the low lands ('loonga lands') of the Holocene terrace comprising stabilized, undissected, higher flood plains and (3) the recent flood plains constituting the present-day flood-prone belts fringing the rivers and streams (Ramesh 1987).

3.2 DRAINAGE

The state is criss-crossed and drained by as many as 10 major rivers, which originate in the hill ranges and flow either in a northerly or westerly direction through the narrow valleys lying between the principal hill ranges. The rivers are fed by numerous tributaries arising from the catchment areas.

The trunk streams and major tributaries run parallel as well as transverse to the structural trend of the area. The two important rivers of West Tripura viz. the Khowai (perennial 6th order) and Haora (perennial 5thorder) drain into Bangladesh plains towards north and west respectively. The valleys are terraced, a greater part being made up of deeply dissected highland of the uppermost terrace, characterized by steep erosional scarp of 15-20m in height along river banks. The intermontane Khowai valley, which broadens and slopes down towards north and lies in between the Atharomura and the Baramura, is drained by the northerly flowing meandering Khowai River. In contrast, the valley sectors situated due west of the Baramura ridge, has a general westerly slope and is drained by the perennial streams e.g. Haorah, Buri Gang, Sonai Gang, Sonai Nadi, Lohar Nala etc., which flow in a highly meandering paths generally towards west into Bangladesh. Trellis drainage is obvious where strike ridges of Neogene rocks are present, while dendritic pattern is well marked in the uppermost (Pleistocene) terrace developed in the valley regions and in some pockets of the hill ranges.

The rivers are significantly perennial and flows are directly related to the rainfall. During summer, the rivers maintain very slender flows, but in rainy seasons, they become swollen and brimful. Drainage pattern is in conformity with topography, thus supporting the sub-parallel drainage system. Anticlinal hill ranges form watersheds from which the various drainage channels emerge. Drainage pattern is typically trellis. Dendritic pattern is also observed at few places, which is of parallel to sub-parallel and rectangular type and here the streams are of first and second order.

3.2.1 Flow Characteristics:

Total annual flows generated by the rivers have been estimated from the flow measurements made by Irrigation Dept., Government of Tripura. Monthly flow measurements are available for 8 rivers at 8 specific measurement points from which annual flows have been worked out for these rivers. Flow characteristics of the Longai, Fenny and other major rivers have been determined by extrapolation. The total volume of surface water generated within the state by the river systems originating in the major hills is approximately estimated as 793 million cubic meters. The maximum volume of water is carried by the Gomati River. Manu ranks next in terms of total annual volume of water. Khowai is the third largest river with the annual flow of 115 MCM. Major part (67.5 %) of the total surface water is contributed by Gomati, Manu and Khowai rivers. Flow of surface water ranges from 1.05 lakh m^3/km^2 in Gomati basin to 0.2 lakh m^3/km^2 in Buri Gang basin.

3.2.2 Harnessing of Rivers:

Annually a large volume of water generated by the river systems is being lost to the neighboring Bangladesh. At present the Gomati is being harnessed for generation of hydel power.

Three medium irrigation projects namely, Gomati in South Tripura, Khowai in West Tripura and Manu in North Tripura are under operation for irrigation of cultivated land in a small scale.

3.2.3 Major River Systems

Major rivers namely Khowai, Manu, Deo, Juri, Dhalai and Longai are characterized by northerly flow, while Gomati, Haora, Muhuri and Buri Gang flow westward into Bangladesh territory. Gomati is the biggest river of the state. Total annual river flow generated within the state is approximately estimated as 793 mcm. Rivers Longai and Fenny are forming the eastern and southern boundaries of the state respectively. The catchment of Longai is shared by Tripura, Mizoram, Assam states whereas that of Fenny is shared by Tripura and Bangladesh. This whole drainage system of the state ultimately forms a part of the Meghna basin, which is depicted in a drainage map in Figure 3.1. Combined flow length of the 10 major rivers within the state is about 896 km. The general hydrographic features of each major river system are as under :

1) **Longai River:** Rises from Jampui Hill range and characterized by a northerly flow between Mizo and Jampai Hills and enters Karimganj district of Assam near Damcherra. Flow length is about 98 km.
2) **Juri River:** The Jampui hills are the sources of this river. It has a northerly flow through the Dharmanagar valley on the eastern side of the SakhanTlang range.
3) **Deo River:** Rising from the Jampui Hill range, it flows northward through the Kanchanpur valley between the Jampui and the Sakhan range and then turns westward, crosses the Sakhan and meets Manu river near Kumarghat in central part of the valley between Sakhan and Longtarai. Flow length of Deo river is 98 km in the state from its source up to its confluence with Manu.
4) **Manu River:** It originates from Kahoishib peak of SakhanTlang range and is joined by two tributaries namely the Chhamanu, originating from Longtarai hills and the Deo, coming from Jampui hills and their combined flow drains the valley between Sakhan and Longtarai ranges in a northern direction. After intercepting the flow from Deo river the Manu flows northward into Bangladesh past Kailasahar. Length of the Manu River is about 167 km. With its tributary Deo, Manu has a combined catchment area as 1979 sq. km. in the state. Manu river has an annual flow of about 170 MCM.
5) **Dhalai River:** It has its source in the Longtarai range near Dulajari peak. It is characterized by a northerly flow through the Kamalpur valley of Dhalai district between the Longtharai and the Atharomura ranges. It flows into Bangladesh near Kamalpur town after completing 117 km course in the state. It has a catchment area of 695 sq. km. and an annual flow of about 42 MCM.
6) **Khowai River:** The river has its source in the Longtarai and flows northwestward up to a point near Teliamura town and then it takes a northerly course draining Khowai valley between the Longtharai and the Baramura ranges. It flows into Bangladesh near Khowai town. The river has a flow length of 166 km within the state. The river receives water form a number of tributaries. The Khowai valley extends for about 70 km in length and is about 25 km in width and the land is very fertile. The river has a catchment area of about 1378 sq. km. and has annual flow of 115 MCM.
7) **Haora River:** It originates from the eastern side of Baramura range, flows westward through alluvial plain of Agartala valley, passes by the southern periphery of the capital city of Agartala and ultimately enters Bangladesh near Ganga Nagar (west of Agartala town) to disgorge itself into the Titas river of Bangladesh. Flow length of the river in Tripura is about 53 km and has about 570 sq. km. of catchment area. Annual flow as estimated by Irrigation Department, Govt. of Tripura is 36 MCM.

8) **Gomati River:** The catchment of the river lies in the southern parts of the Longtarai and Atharomura ranges. The river flows westerly through the sub-divisional towns of Amarpur, Udaipur and Sonamura and debouches into Meghna River in Bangladesh. The river Gomati is about 133 km long and has about 2492 sq. km. of catchment area and has about 249 MCM of annual flow. A dam has been constructed in the gorge between the Atharomura and Kalijhari ranges for generation of hydel power and development of Irrigational facilities as well.

9) **Muhuri River:** It is originated in the Deotamura hill range and has a westerly course through hilly areas and plains, draining the central portion of the South Tripura district and enters Bangladesh near Belonia town. It has a length of 64 km and has a catchment area of 1014 sq. km. in the state. It has annual flow of about 76 MCM.

10) **Fenny River:** The River forms the border between Tripura and Bangladesh. At the source there are 3 streams namely Asalong, Rangafenni and Taindung, the Asalong being the main channel. It flows initially southwards, thereafter takes western direction and finally enters into Bangladesh.

3.2.4 Basin Characteristics

Out of the 10 river basins, 8 basins are within the territorial limit of the state, while the basin areas of Longai is shared by Tripura, Assam and Mizoramand that of Fenny is shared by Tripura and Bangladesh. The basin-wise details are presented in Table 3.1. The Gomati is the biggest basin with 22.66 % of the total geographical area of the state and the Longai is the smallest (3.25 %).

Table 3.1 : Area occupied by Various River Basins in Tripura

Sl No	Name of river	Basin area in sq. km.	% of basin area to geographical area of the State	Annual flow in 1000 cubic meter	% of flow to total flow	Districts Covered
1	Burima	658	6.27	13428	1.69	West Tripura
2	Dhalai	695	6.61	42778	5.40	Dhalai
3	Fenni	555	5.28	50433	6.36	South Tripura
4	Gumti	2378	22.66	249399	31.45	Dhalai, South & West Tripura
5	Haora(Saidra)	570	5.43	36032	4.54	West Tripura
6	Juri	586	5.57	15709	1.98	North Tripura
7	Khowai	1378	13.13	115854	14.61	West Tripura & Dhalai
8	Longai	342	3.25	9166	1.66	North Tripura
9	Manu-Deo	1979	18.86	170034	21.44	North Tripura & Dhalai
10	Muhuri	839	8.00	76247	9.63	South Tripura
11	Other streams	511	4.90	13797	1.74	
	Total	**10491**	**100**	**792877**	**100**	

Source: Department of science, technology and environment

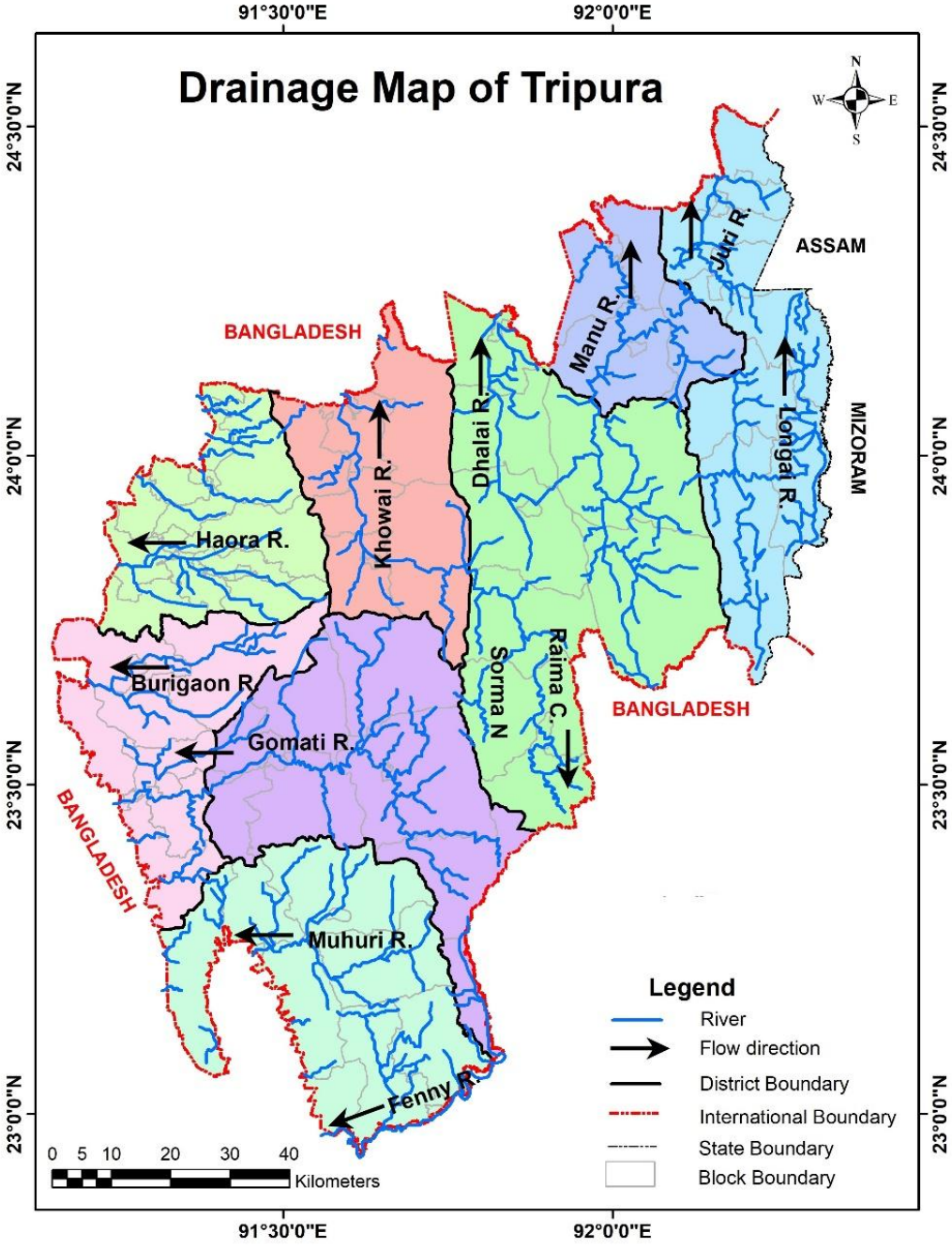


Figure 3.1 : Map showing the major drainage system of Tripura

4. GEOLOGY

4.1 REGIONAL GEOLOGICAL SETTING

The geologically of the state of Tripura is characterized by a succession of hill ranges and valleys of meridional and sub-meridional trends. The hill ranges are actually box-like anticlines with relatively compact and resistant older rock units exposed in the narrow crests, whereas the valleys are flat synclines with younger and softer rock units exposed in the wide troughs. The folded belt constitutes the frontal sub-belt of the Assam-Arakan geosynclinal basin being separated on the east by the inner mobile sub-belt of the Mizoram consisting of tight linear folds.

4.2 GENERAL STRATIGRAPHY

Geologically, Quaternary and Upper Tertiary Groups of sediments occupy the state of Tripura. Mobile trough geosynclinal deposition of Barail Group followed by Flysch type of Surma and molasse type of Tipam sediments is noticed in the state. The Geological Succession of the State is given in Table 4.1.

Table 4.1: Geological Succession in Tripura State

Age	Group	Formation	Lithology
Quaternary	Recent	Recent	**Alluvium**: represented by unconsolidated pale to dirty gray silt, sand, clay, silty clay, sandy clay etc. with decomposed vegetable matter and yellowish brown coarse river sand, gravels, pebbles and various other concretions.
	---------- UNCONFORMITY----------		
Upper Tertiary	Dupitila	Dupitila	**Shale/Sandstone:** Brown to buff sandy clay with grayish sandy loam, clayey sandstone with ferruginous materials and laterites.
	---------- UNCONFORMITY----------		
	Tipam	Champaknagar Manubazar	**Sandstone:** Massive medium to coarse sandstone with sandy shale. **Sandstone:** Fairly laminated, bedded fine to medium sub-arkosic sandstone with sandy shale and siltstone.
	---------- UNCONFORMITY----------		
	Surma	Bokabil Bhuban	**Sandstone:** Thinly laminated, bedded sandstone and silt (repetition) with ferruginous materials, medium to coarse micaceous sandstone with mudstone **Shale/Sandstone:** Intruded, hard compact, both massive and well-bedded sandstone, dark to olive shale repeated (exposed in core of anticlines)

------- **Basement not known ---------**

The succession from bottom to top has been lithostratigraphically sub-divided into Surma, Tipam and Dupitila Groups. The more argillaceous rocks exposed in the cores of the anticlines are equivalent to the Surma Group of Mio-Pliocene age which is about 4 km thick in Tripura. The younger arenaceous beds in the flanks comprise the Tipam Groups of probable Upper Pliocene age and are over 2 kms thick. The sediments in the synclinal troughs in the west Tripura are at places unconformably overlain by a sequence of unconsolidated to semi-consolidated sediments arranged in neat terraces, which is named as Dupitila Group.

4.3 DISTRIBUTION OF VARIOUS GEOLOGICAL FORMATIONS

The distribution of the geological formations is shown in Figure 4.1 and is described as follows:

a) Surma Group: The Surma Group of rocks have been further subdivided into a lower, the relatively more arenaceous, Upper Bhuban unit and an upper, the mainly argillaceous Bokabil Unit. The rocks of Bhuban Formation, consisting compact calcareous sandstones and calcareous shales, fine grained sandstone and limestone are exposed in the cores of the anticlines of the state, viz Atharomura, Longtarai and Jampui hills etc. The sandstone forms the predominant rock type with shales occurring as the alternating unit. The limestones occur as small discontinuous lensoidal bodies within the shale, and vary in thickness from 0.2 to 2.3 m. Some of the sandstone and limestone beds contain fossils of mainly bivalves and gastropods. These formations usually from high hills with steep slopes and are conformably overlain by Bokabil Formation. The rocks of Bokabil Formation are predominantly of argillaceous composition, consisting of siltstone with small interbedded sandstone and are exposed on both limbs of the anticlines. The thin sandstone units are restricted to the lower portion of the Bokabil Formation.

b) Tipam Group: The Tipam Formations are conformable and transitional to the underlying Bokabil Formation. These Formations are arenaceous in character and comprise light yellow to light buff and brownish yellow sandstones with occasional thin bands of siltstone and boulders of calcareous concretion and coal streaks, which occur along the outer flanks of the anticlinal hill ranges with moderate dip to near horizontal disposition. The sequence of these formations shows variations due to facies changes within the group. The group could be divided into two district formations, the lower formation being finer than that of the upper formation, although both retain the principal sub-arkosic character. The maximum thickness of these formations is estimated to be around 1400 m and the minimum is 400 m.

c) Dupitila Group: The Dupitila sediments consisting of earthy brown to buff sandy clay, mottled clay, clayey sandstone and coarse to gritty ferruginous sandstone unconformably overlie the Tipam Formation and are well developed in central portion of the synclinal valleys, especially in the west of Baramura anticline. These formations occur in the form of disconnected mounds. The thickness of these formations varies from 10 - 30 m.

d) Recent Group: Most of the longitudinal synclinal valleys of the state are the basins of deposition of the Recent Formation. Recent alluvium occurs along streams and flood plains of major rivers. It consists of coarse sand, sandy silt, silty clay and clay. This Recent Alluvium formation belongs to Quaternary age. Study of Quaternary Geology of Tripura through the Quaternary mapping from a morpho-stratigraphic approach in parts of the Khowai, Haorah, Sonai Gang and adjacent valleys, has demonstrated the existence of extensive outcrops of Quaternary fluvial sediments which form a four tier system of terraces; two belong to the Pleistocene and the other two to the Holocene.

(i) Pleistocene Sediments: The Pleistocene sediments in West Tripura occur in the form of river terraces designated as T1 & T2 and are best developed in valley sections having the maximum areal coverage and thickness in the state. The salient geo-morphological/geological charactersof these sediments are as follows.

(a) Upper Terrace Formation (T1): This constitutes the uppermost and the oldest terrace extensively developed in the valley sections, having the maximum areal coverage and thickness. It has a paired character and is intricately dissected into incipient badlands. Lying generally between 15 m and 93 m above MSL, it forms a gently sloping plateau surface, abutting against the hill ranges. The fluvial sediments

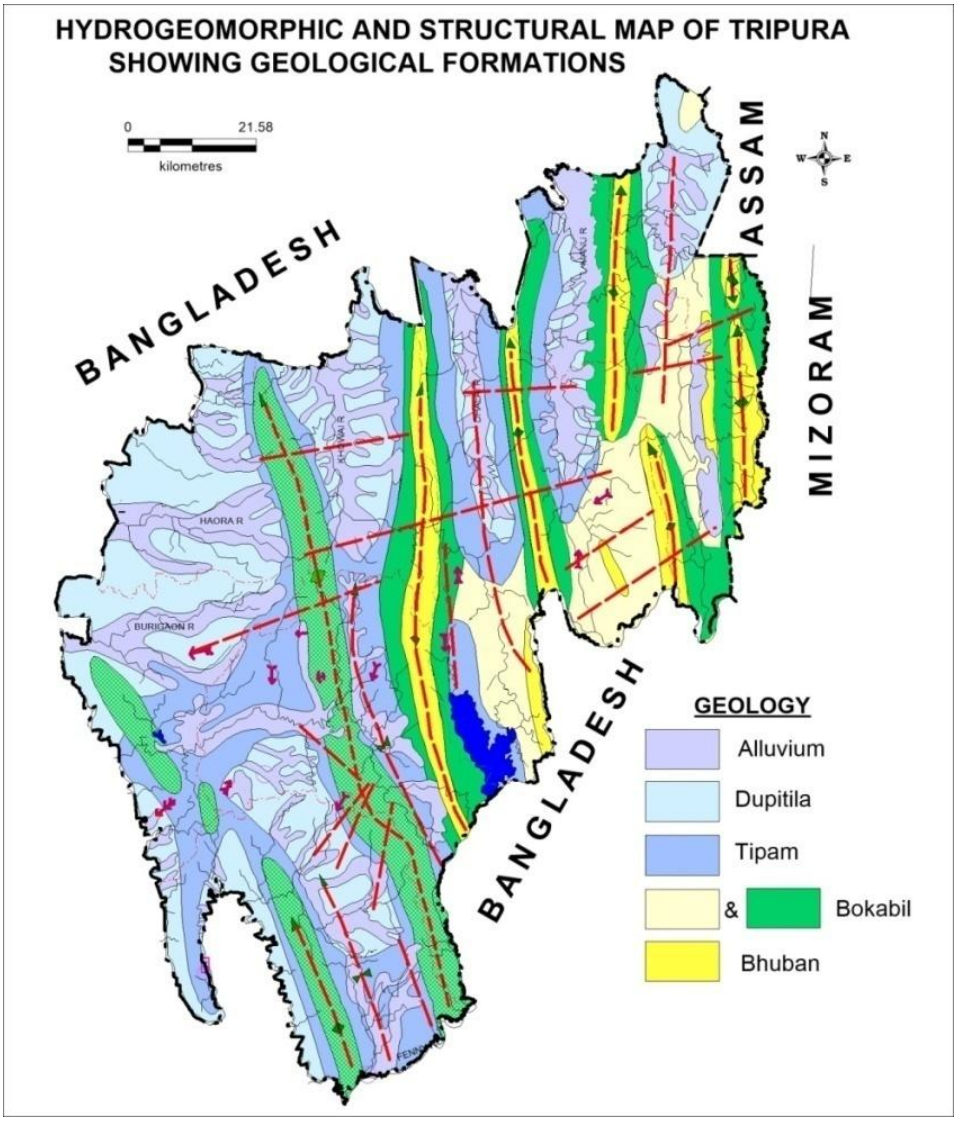
of this unit unconformably overlie the folded sedimentary sequence of the Mio-Pliocene age.

(b) Lower Terrace Formation(T2): It occurs as low mounds and small islands, a step (6 – 8 m) lower than the upper terrace (T1). It is a minor component in the terrace sequence and contains mainly oxidized, lemon yellow, sticky clay with thin soil (Entisol) cap. It is also assigned an Upper Pleistocene age on geomorphological/ geological rounds.

(ii) Holocene Sediments :

(a) Unit- 3 (T3): This unit (paired terrace) is less extensive than Unit - 1 and occurs in roughly linear belt flanking all the present day major rivers/streams and as minor valley fills. Its upper surface, flat, lies at the level of the general valley floor . It consists of unoxidized or feebly oxidized/altered yellowish gray and grayish yellow silty clay, grading down to pure sand (rarely silica sands) and occasionally pebble beds.

(b) Unit - 4 (T4): It is the youngest unit and still forming. This occurs in linear belts fringing the extant drainage to which it is clearly related. Extraordinary flood plains and neo-flood deposits of the channel bars, point bars and channel fills constitute this unit. It is made up of fresh deposits of well-sorted sands, silts and some clay. Semi-carbonized tree trunks and twigs are commonly present.



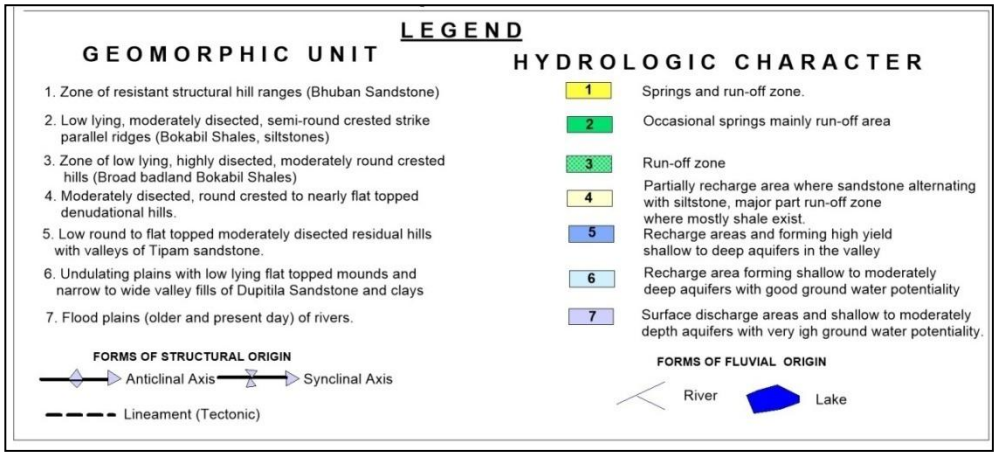


Figure 4.1: Map showing distribution of Geological Formations, Geomorphic Units and Structures

4.4 SUB-SURFACE GEOLOGY

The state of Tripura is underlain by folded sedimentary formations ranging from Lower Tertiary to Recent. Tightly folded anticlines and synclines traverse the most parts of the state roughly in an N-S direction. Anticlinal crests are occupied by Bokabil Series of rocks which are argillaceous in nature. Valley areas are underlain by the Tipam Group of rocks with a fine to medium coarse grained sandstones with intercalations of argillaceous lenses. The argillaceous sands occurring in upper horizons form shallow aquifers. Tipam sediments occurring in deeper horizon constitute the principal aquifers in Tripura.

Sub-surface geology has been interpreted from boreholes drilled by CGWB and various State Government Agencies. Granular zones encountered down to a depth of 300 m belong to semi- consolidatedTipam and Dupitila groups and constitute medium to coarse grained, sub-rounded quartz, feldspathic material, whose occurrence and thickness vary laterally as well as vertically.

(A) North Tripura District: Sub-surface geology and disposition of aquifers in the N - S oriented parallel Dharmanagar- Kanchanpur of North Tripura district is depicted in Figure 4.2 & 4.3.

Dharmanagar – Kanchanpur valley: This valley is dominated by thick sandstone horizons with thin intervening shale/clay horizons. In the central part of the valley sand layers exist but comparatively thin granular zones intercalated with shale occur within 90 m bgl. However, towards the north (Ichailalcherra) and south (Machmara) the thickness of clay/shale is more.

Sand layers occur at a depth range from 7 to 14 m bgl. Below this, a thick clay bed occurs all along the valley and its thickness increases towards north (Ichailalcherra). Below this clay bed sandstone, fine to medium grained, yellowish brown in color occurs.

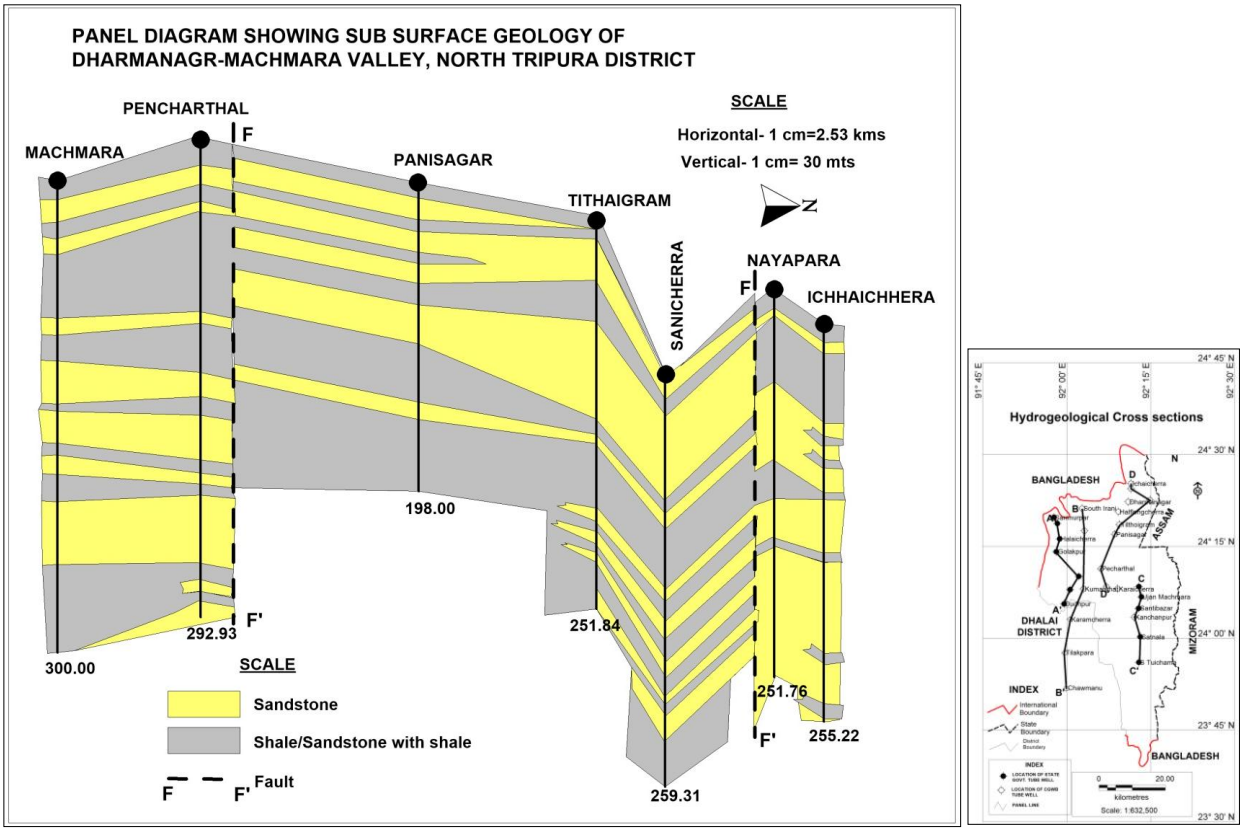


Figure 4.2: Co-relation of Sub-Surface Formations in Dharmanagar-Machmara valley of North Tripura District

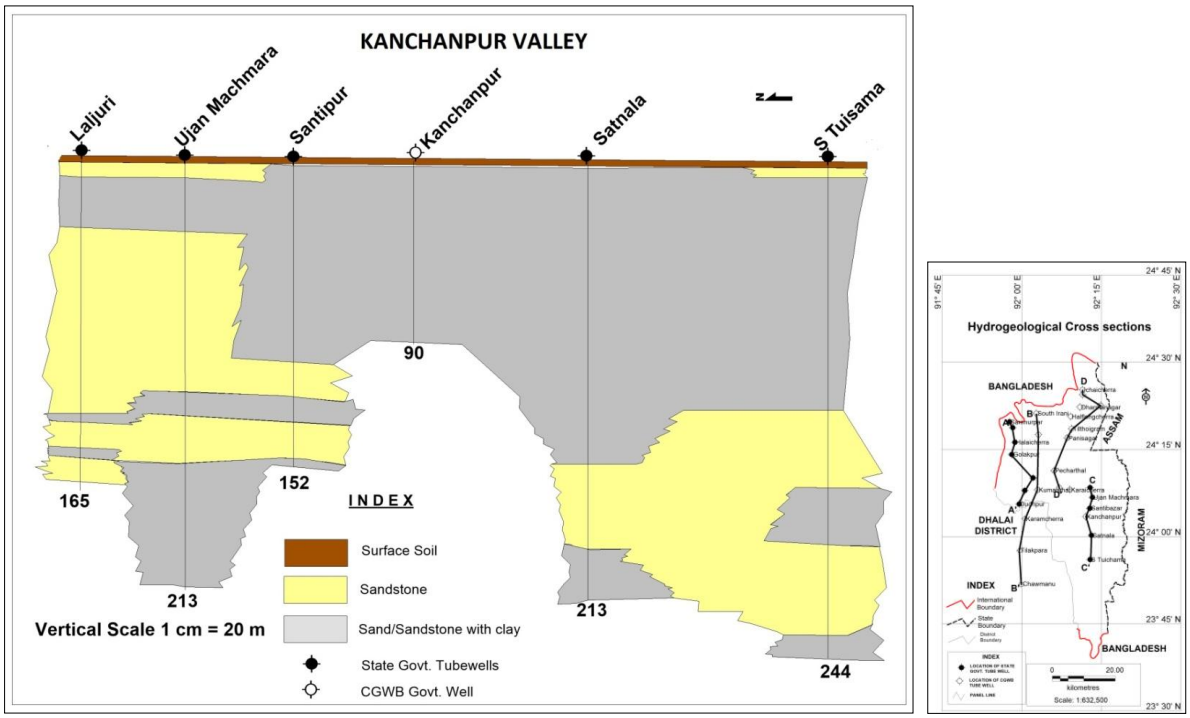


Figure 4.3: Co-relation of Sub-Surface Formations in Kanchanpur valley of North Tripura District

(B) Unakoti District:

Kailashahar valley: The panel diagram of Kailashahar valley (Figure 4.4) shows that in the central part of the valley, Kumarghat – Karamcherra area, a continuous granular zone of thickness varies from 100 – 135 m occur below 5 m. The thickness of this zone gets reduced towards north and south due to the presence of clay/shale horizons. Other granular zones present at depth are comparatively much thinner and intercalated with clay/shale horizons. Another granular zone of some significance occur below 200 m with thickness varies from 25 to 40 m.

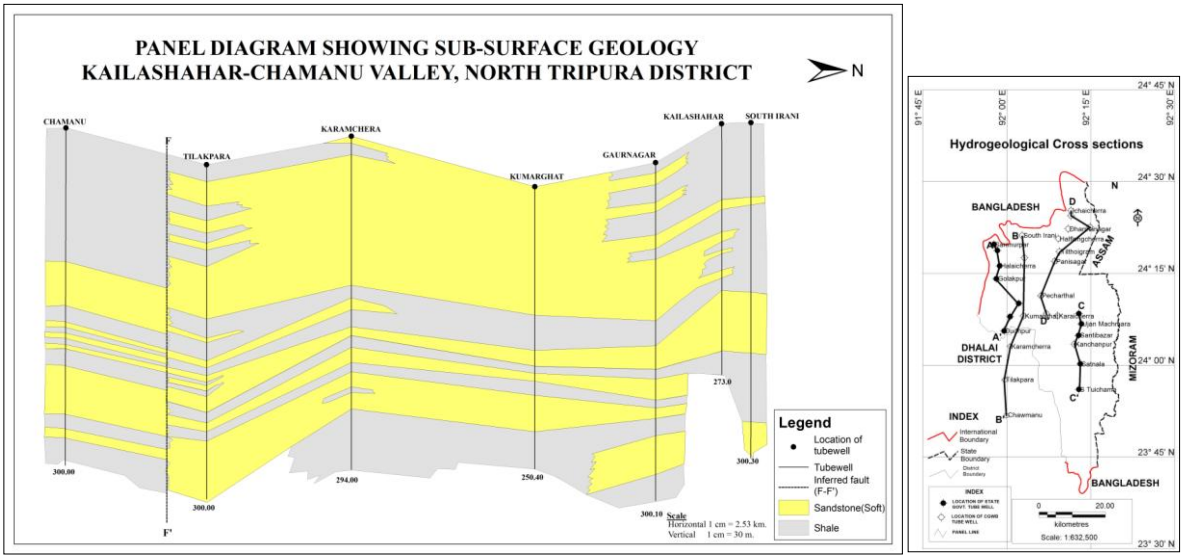


Figure 4.4: Panel Diagram showing Sub-surface Geology of Kailashahar-Chaumanu valley in North Tripura district

(C) Dhalai District :

(i) Manu valley: The Manu and Chawmanu block area is a part of southern extension of Kailashahar valley. The panel diagram for Manu valley (Figure 4.5) shows the presence of fairly good thickness of fine to medium grained sandstone horizon in the northern part of the valley, covering Karamchera (Manu) area. However, in the fringe area of Langtarai and SakhanTlang hill ranges, clay/shale predominate in the top horizon. Possibly this phenomenon is due to lithofacies change. But in the south while the thickness of granular zone within the first 120 m depths gets reduced due to appearance of tongues of clay/shale horizon the entire thickness of sandstone appears to have been displaced by clay/shale at Chawmanu. This may happen due to fault or lithofacies change. Below the first 100-120 m thick granular horizons observed in the central part of the valley, the other granular horizons at depth are of minor nature and thickness and are intercalated by clay/shale horizons. Another significant granular horizon occurs at a depth below 200 m with almost uniform thickness of 25 to 40 m. These granular horizons form productive aquifers in this valley.

In Manu block, between Manu and Karamcherra, 4 to 5 granular zones are available. The first zone is quite thick and is occurring between 20 – 135 m bgl. Other granular zones are occurring in the depth ranges of 145 – 155 m bgl, 160 – 170 m bgl, 190 – 210 m bgl and 210 – 240 m bgl. Exploratory wells drilled by CGWB at Chawmanu shows the area is dominated by shaley horizons within 300 m bgl. Two good granular zones are occurring in the depth ranges of 120 – 165 m bgl & 210 – 250 m bgl. Apart from this a few very thin granular zones also occur in the depth ranges of 170 – 200 m bgl & 260 – 300 m bgl.

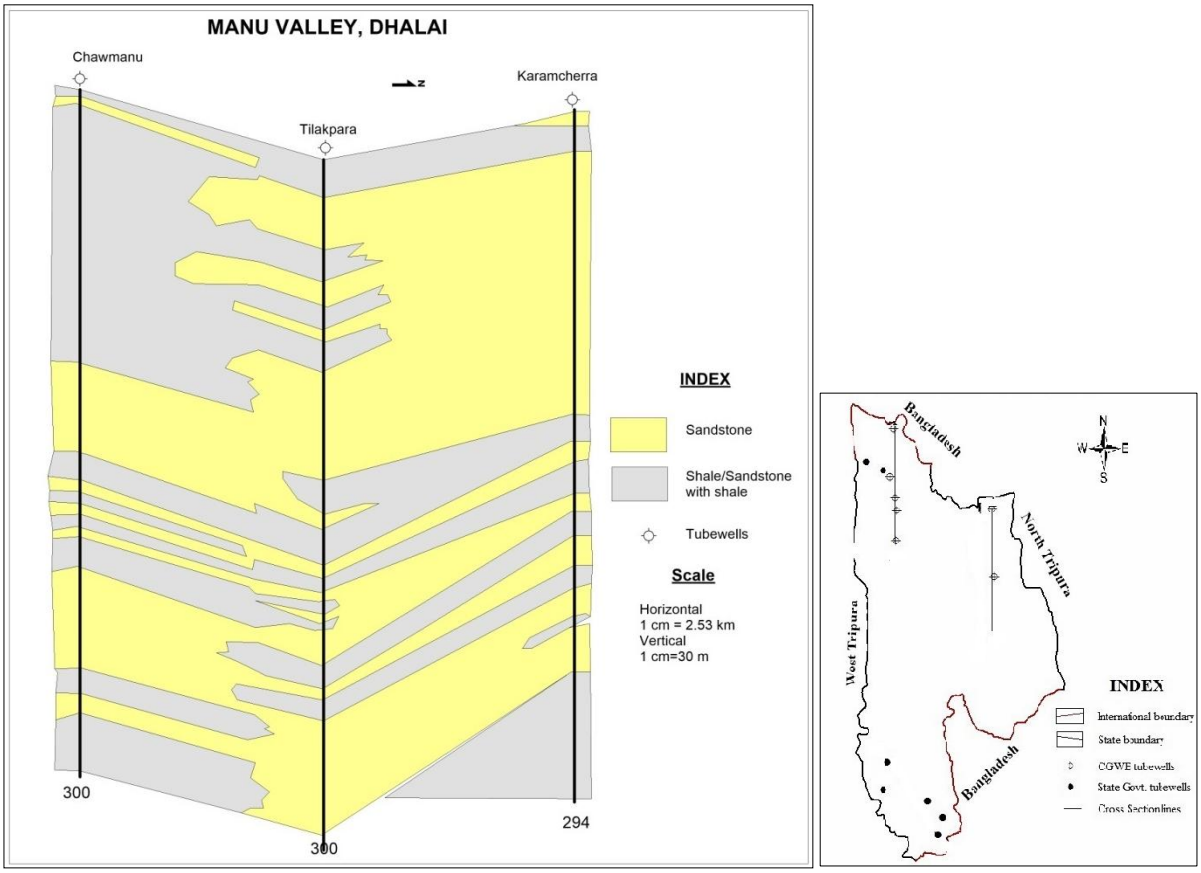


Figure 4.5: Sub-Surface Formations and Aquifer disposition in Manu valley, Dhalai District

(ii) Kamalpur valley: Kamalpur valley containing Salema and Durga Chowmuhani blocks is largely dominated by shaley horizons except in the central part of the valley at Bhatkhowri where three distinct deeper sandstone horizons of significant thickness can be seen. These granular horizons appear to have been displaced due to subsurface faults towards north. The sub-surface conFigureurations of different granular zones in this valley have been shown in a panel diagrams (Figure 4.6). Three to four numbers of thin granular zones occur within 250 m bgl.

In Ambassa area (Figure 4.6), which is the southern extension of Kamalpur valley, the first shallow granular zone is encountered at 21 m bgl and its thickness is 8 – 10 m and the second granular zone occurring below 50 m bgl. In Bhatkhowri area total 4 nos. of aquifers are available within 300 m bgl. The granular zones are found within the depth ranges 15 – 75 m bgl, 100 – 120 m bgl, 180 – 270 m bgl and also below 285 m bgl.

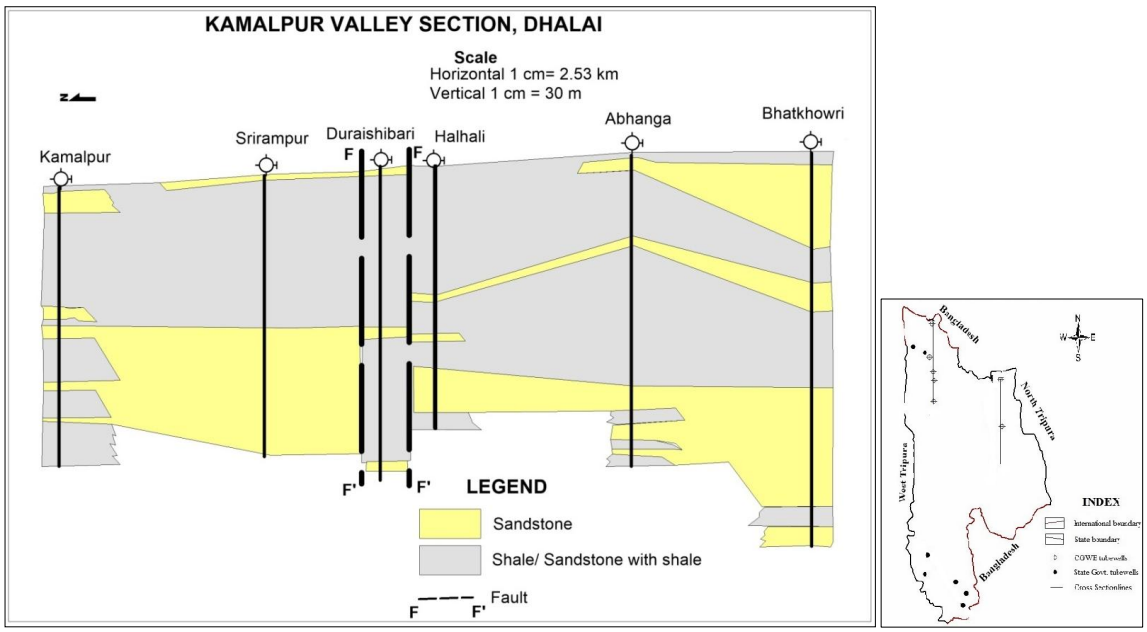


Figure 4.6: Co-relation of Sub-surface Formations in Kamalpur valley of Dhalai District

(D) Khowai District:

30 to 45 m thick granular zone was encountered within 50 m depth. It thins down to 6 m towards Khowai-Baijalbari area. Four granular zones were encountered within 50 to 300 m bgl and thickness of these granular zones varies from 15 to 100 m, which laterally grade into clay. The same is depicted in Figure 4.7.

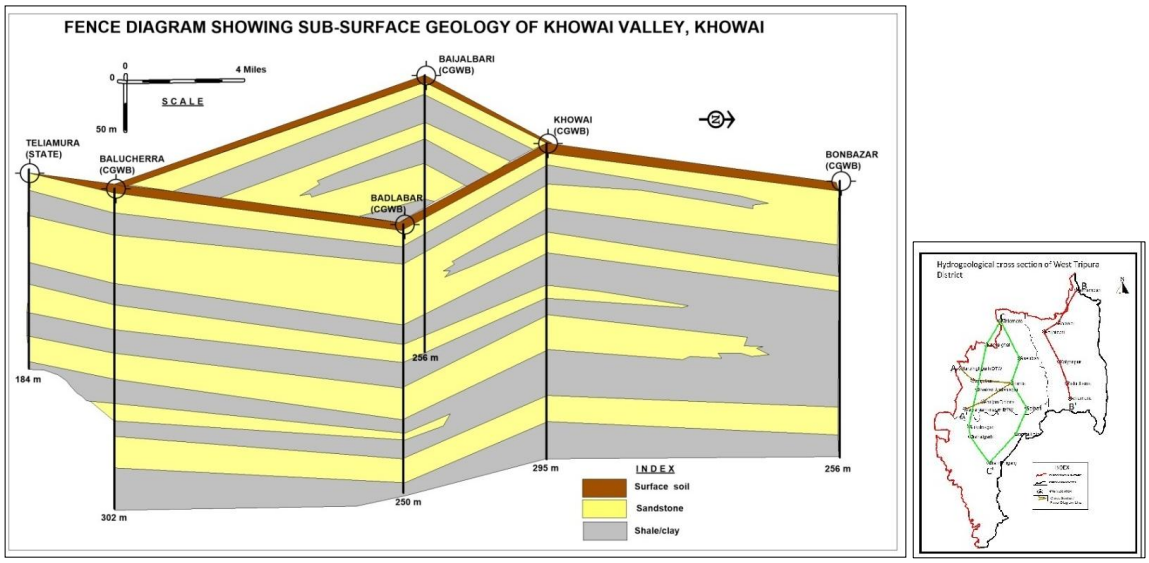


Figure 4.7: Panel Diagram showing Sub-Surface Formations Khowai valley of Khowai district

(E) West Tripura District:

Sub-surface conFigureurations of different granular zones in Agartala valley of West Tripura district have been shown through panel diagrams in Figure 4.7.

Agartala valley: 40 – 100 m thick granular zone occur within 120 m depth. This zone is without any consistent clay capping, but in Veluarchar area, it is confined by 40 m thick clay horizon. In Jirania - Mohanpur area, the granular zone continues uninterruptedly down to a depth of 280 m. In Mohanpur - Sasubari area, within this thick granular zone, 20 – 40 m thick clay horizon is found at a depth range of 40 to 70 m bgl. In western half of Bishalgarh block three more granular zones occur with 20 – 70 m thickness and laterally grade into massive plastic clays towards eastern part of the block. In Agartala town, a thick granular sandstone zone occurs between 20 & 185 m bgl and is intercalated with claystone/shales. Granular zone consists mainly of fine-grained sandstone with grain size increasing a little bit downwards. Sub-surface formations and aquifer dispositions as deciphered by exploratory drilling of CGWB in and around Agartala have been presented in the Figure 4.8.

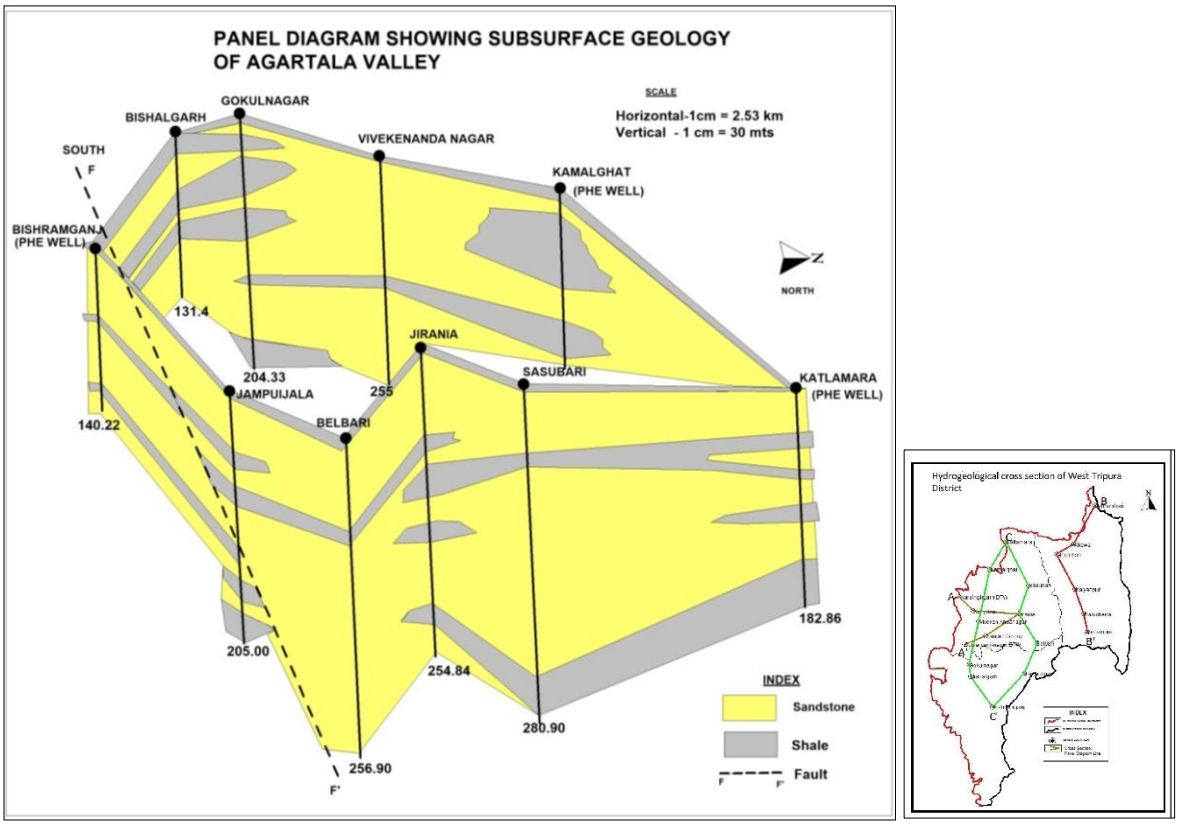


Figure 4.8: Panel Diagram showing Sub-Surface Formations in Agartala valley of West Tripura district

(F) Gomati District:

Amarpur valley: The panel diagram of Amarpur valley shows disposition of sandstone horizons is more or less uniform in Amarpur – Ompinagar area, where four prominent zones are discernible. First granular zone is occurring below 30 to 40 m thick clay/shale bed and having thickness of 6 – 10 m. Second horizon is encountered at the depth of 40 – 50 m and the thickness of granular zone is almost 30 – 40 m. Below 160 to 180 m depth the sediment is prominently clayey up to the depth of 250 m or more (Figure 4.9).

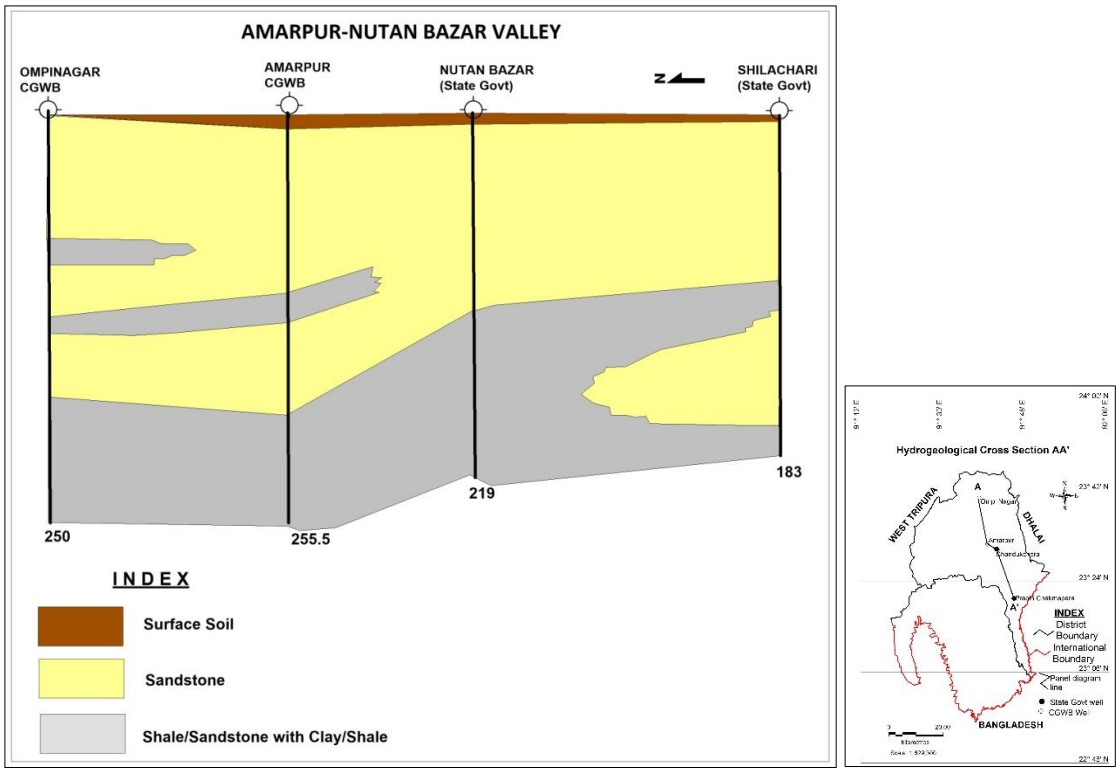


Figure 4.9: Sub-Surface Formations and Aquifer dispositions in Amarpur-Natunbazar valley of Gomati District

(G) South Tripura District:

The granular zones encountered down to 255 m bgl belong to semi-consolidated Tipam and Dupitila formations and constitute medium to coarse grained, sub-rounded quartz, feldspathic material. Occurrence and thickness of these zones vary laterally as well as vertically. It has been interpreted on the basis of lithological logs of boreholes drilled by CGWB and various State Government Agencies. Sub-surface conFigureurations of different granular zones have been shown in panel diagrams (Figure 4.10).

Udaipur – Subroom valley: This valley is a southern extension of Agartala valley and dominated by thick sandstone horizons with thin intervening shale/clay horizons particularly in the northern and southern part. In this valley, generally the first granular zone occurs between 40 & 56 m bgl and second granular zone between 60 & 140 m bgl. In Udaipur – Rajapur - Tulamura area three alternating layers of sandstone and shale occur between 20 & 250 m bgl. The first granular zone is encountered in the range of 25 to 56 m bgl and the thickness of the zone varies from 14 to 25 m. The second granular zone occurs in the range of 60 to 140 m bgl. In the central part around Baikhora and Satchand the sandstone is quite thick and forms almost a single aquifer system with layers of clay occurs locally creating a confined condition. In Subroom - Manubazar area 60 - 90 m thick first granular zone occured between 35-135 m bgl and second granular zone encountered at a depth of 150 - 195 m bgl. In the southern part of Belonia and eastern part of Manu-Bhanga hill range (around Srinagar) the sedimentary formation is more argillaceous.

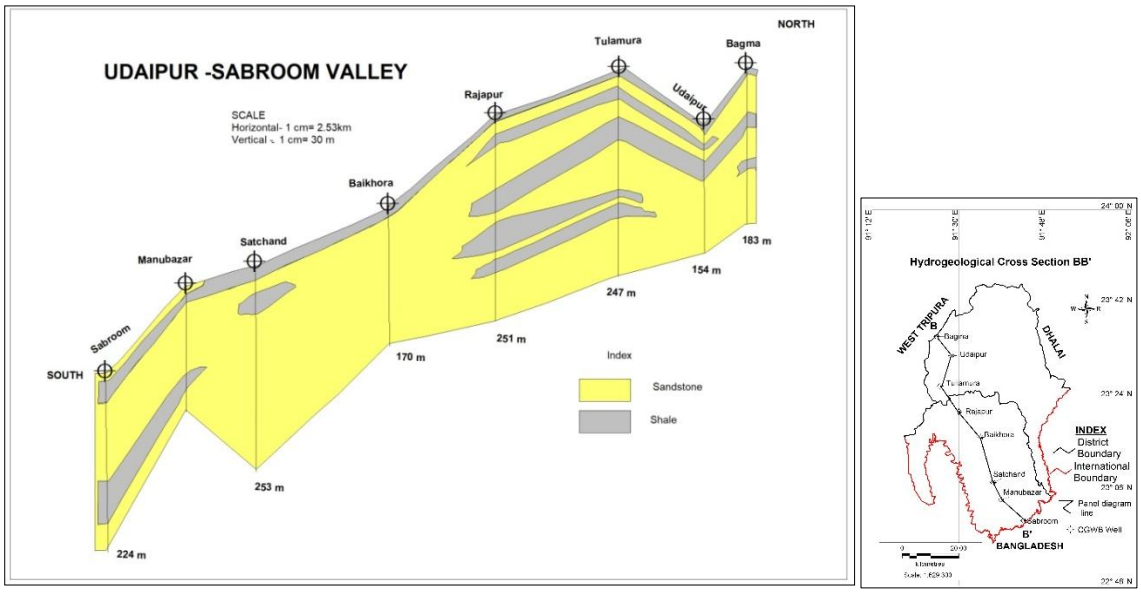


Figure 4.10: Sub-Surface Formations and Aquifer dispositions in Udaipur-Sabroom valley of South district

4.5 STRUCTURE

Tectonically, the state comprises a series of sub-parallel, arcuate, elongated, doubly plunging folds arranged en-echelon and trending in an average north-south direction with slight convexity to the west (Kher and Ganju, 1984). Passing from east to west the deformation in this belt becomes progressively younger and less intense and thus the intensity of folding increases eastward. The folds are characterized by tight and narrow, box like anticlines alternating with broad flat synclines. The anticlines forming ridges are asymmetrical or symmetrical and traversed, in most cases, by north-south longitudinal reverse faults. The steeper flanks of the asymmetrical anticlines commonly form monoclinal steps, and these are often dislocated and upthrown against the dipping flanks of the adjoining synclines. Most of these faults disappear towards the plunge of folds. Individual structures have internal complexities in the form of cross-faults, oblique faults and lineaments trending in NW-SE and NE-SW to ENE-WSW directions and dividing the structures into separate blocks. In short the salient features are as follows:

a) Folds are elongated and aligned in sub-meridional to meridional trend mostly with westerly convexity.
b) Folding is of parallel to sub parallel type
c) Anticlines are tight relative to the intervening synclines.
d) Intensity of folding increases eastward.
e) Anticlines are asymmetrical or symmetrical and traversed in most cases by N-S longitudinal reverse faults.
f) Most of the longitudinal reverse faults disappear towards the plunge of folds.
g) N-S faults are offset by NW-SE and NE-SW to ENE-WSW trending lineaments/faults, latter being younger.
h) Most of the surface gas shows are located near or along lineaments/faults.
i) More than one culmination is recognized in majority of anticlines.
j) Anticlinal axis is not sinuous as referred by earlier workers, but is offset by various cross trends.
k) Some of the anticlines, e.g. Langtarai, Sakhan and Gojalia are flanked by longitudinal faults trending in opposite directions.
l) Faults with a dominant strike slip component appear to intervene between anticlines arranged in an en-echelon pattern e.g., Rokhia-tichna, Baramura-Teliamura and Machli-thum-Khabal.

m) A longitudinal reverse fault flanking the southern part of Sakhan structure and ending up as a splay appears to link up with a major NNW-SSE trending Kaladam fault having dominant strike slip component.
n) The Kaladan fault limits the structural style of Tripura folds to the east from compressed Mizo folds.
o) A prominent NE-SW trending lineament aligned along sudden deflections of the river Meghna appears to limit the structural style of Tripura folded belt to its west.
p) This lineament follows an alignment of gravity contour kinks and earthquake epicenters and hence may represent a deep-seated fracture.

Seismic surveys have, however, revealed the subsurface occurrence of faults, subsidiary folds and other structural complications even within the superficially undisturbed, gentle folds. Drilling results have shown the presence of a few anomalous zone of steeply dipping beds in central parts of the structures and the possible presence of upward spreading fault zones in the sub-surface.

The microscopic folds are varied in style. They are preserved mostly in the thinly laminated multilayer of silt-shale alternations of both Bhuban and Bokabil Formations. Two types are common sharp crested and disharmonic. Parallel (concentric) folds, overturned, recumbent and box folds are confined to the eastern sector.

4.6 SEISMOTECTONICS

The Surma Basin in the Tripura-Mizoram area lies in between the seismically active Shillong Plateau to the north and Arakan Yoma to the east. Though epicenters of very few earthquakes recorded during the recent past fall in this area, it has, however, been affected by some of the famous earthquakes like the Bihar-Nepal (1934), Kangra (1905), Greater Assam (1897), Dhubri (1930), Srimangal (1918) and Assam (1975) earthquakes. The epicenter of the devastating Srimangal earthquake of 1918 lies very close to the northern border of Tripura. Tripura, being in this seismically active zone, experiences mild to moderately severe seismic shocks very often.

The style of folding into a series of longitudinal N-S/NNW-SSE trending anticlines and synclines, the conjugate fracture systems and the deformation of the rock types involved in such folding indicate that the whole region was subjected to E-W compressive stress since Pliocene time which continued up to the Pleistocene period. There was a period of quiescence when the flat-lying Dupitilas were deposited in the structural valleys over an erosional surface marking the beginning of the Quaternary period. It is also surmised that the region is still under the influence of E-W stresses, apparently directed from the east. Hand in hand with this, isostatic adjustment is going on in this area being located to the south of the Shillong Plateau with a strong positive Bouguer gravity anomaly. This is also apparent from the occurrence of 0 - gravity anomaly line in the center of the Tripura state. Neotectonic movements due to such isostatic adjustment has produced some cross fractures in Surma Basin, viz. northern border of Gomati flood plain in between Udaipur and Kakraban.

The presence of this misfit streams in the narrow valley (‘loonga’) area and the presence of upright tree trunks and submerged logs indicate that the narrow valleys (loongas) in most of the cases viz. Burigang near Bishalgarh, Charilam, Sekerkote, Bamutia etc. was uplifted during the Holocene times along the conjugate system of fractures and faults.

5. HYDROGEOLOGY

Geologically the state of Tripura is occupied by sedimentary formations of Recent to Tertiary age. Hydrogeologically the state is divided into 4 units i.e Alluvial formation, Dupitila formation, Tipam formation and Surma formation (Bokabil and Bhuban). Fourth hydrogeological unit i.e. Surma formation comprising shale/sandstone is mostly hard, compact and non-porous, thus not considered to be an important unit in terms of ground water potential.

5.1 WATER BEARING FORMATIONS

(i)Alluvial formation: It occurs along the banks of main rivers and in valleys and its thickness is only upto 15m. Ground water occurs under unconfined condition. The ground water development in this formation has not been very significant because of high clay and sandy clay content. Ground water is developed through dug wells and shallow tube wells fitted with hand pumps. These alluvial formations are underlained by Dupitila and Tipam formations.

(ii) Dupitila formation: It occurs nearly in horizontal disposition and its thickness varies from 10 to 30 m forming the near surface aquifers within 30 m bgl. The formation consists of mainly clay and silt with some intercalations of gritty and ferruginous sandstones. It is exposed in the central portion of all the major valleys and also on northern part of Manu valley. In general, it has low permeability and low storage capacity due to high clay content. Ground water in this formation occurs under unconfined condition, which is developed through dug wells and hand pumps.

(iii) Tipam formation: Tipam formation constitutes the principal and productive aquifer horizons. Due to higher porosity and permeability; transmissivity and storage co-efficients of the formation is much higher than that of Dupitila formation or Surma formation. The recharge area of the formation is in the surrounding anticlinal hills. This formation consists of sub-rounded, fine to medium grained, friable sandstone with intercalated clay. Ground water occurs under unconfined, semi-confined to confined conditions. This formation is developed by deep tube wells and mini deep tube wells fitted with electric motors, shallow tube wells, Mark - II/III and hand pumps.

5.2 OCCURRENCE AND MOVEMENT OF GROUND WATER

Ground water in Tripura occurs under unconfined to confined conditions. At shallow depths, in shallow aquifers ground water occurs mainly under unconfined condition. In some small isolated zones ground water at shallow depths occurs under semi-confined to confined conditions and sometimes shows artesian condition due to presence of top clay. Water bearing formation occur both in shallow Quartanary alluvial formation and Tertiary coarse clastics occurring in deeper horizons.

In Alluvial, Dupitila and Tipam formation (at shallow depths) groundwater occurs under unconfined condition. However, in Tipam formation groundwater occurs under semi-confined to confined condition in most of the cases.

The movement of groundwater in unconfined aquifer is towards north in Longai, Juri, Manu-Deo, Dhalai and Khowai basins and almost towards west in Haora, Burigang , Gomati and Muhari basins.

5.3 HYDROGEOLOGICAL CONDITIONS

The semi-consolidated Tertiary Formations constitute the main hydrogeological units in the state. Other small depositions of alluvial formations of Recent age also constitute the local hydrogeological units along major river courses. The hydrogeological units of Tertiary Formations consist of friable sandstones, claystones and shales which can be subdivided into two groups namely Dupitila Group and Tipam Group. Formations belonging to Dupitila Group are mainly clay and silt with some thin intercalations of gritty and ferruginous sandstones, whose thickness is limited to 10 - 30 m and prominent in the western parts of the state. Storage Capacity and permeability of the formations of Dupitila Group are very low due to the occurrence of thick clay layers. Formations of Tipam Group are mainly soft, massive and friable sandstones and alternating layers of shales, which are exposed throughout the state along the outer flanks of the anticlinal hills with moderate dips and are occupying the synclinal valleys as well. Thickness of Tipam Group is about 1400 m. Due to their poor consolidation and moderately medium grained texture, the Tipam sandstones form the principal and only productive aquifer system. General hydrogeological setup of Tripura is presented in Figure 5.1.

CGWB has carried out Intensive hydrogeological surveys and ground water exploration through drilling and construction of 65 EW, 19 OW, 2 SH and 12 Pz under NAQUIM studies programme and under Ground Water Exploration Program (Annexure- II & III). Besides CGWB, Drinking Water and Sanitation Department (DWS); Govt. of Tripura, PWD (Water Resource), Govt. of Tripura and other state agencies have drilled a number of deep tube wells in the state. Based on the lithological logs of these tube wells, valley-wise hydrogeological sections have been drawn to study the lateral and vertical distribution of the aquifer system in Tripura.

Hydrogeological sections in Agartala-Udaipur-Sabroom valley show the presence of clay intercalations and two to four granular zones (Figure 4.7 and 4.9; Annexure - II & III). The first granular zone occurs in the depth range of 7 to 60 m bgl, second granular zone occurs within 70 to 130 m, while the third granular zone occurs in depth range of 170 to 250 m. In the central part around Baikhora and Satchand the sandstone is quite thick and forms almost a single aquifer system with layers of clay occurs locally creating a confined condition.

The perusal of the hydrogeological section in Khowai-Teliamura-Amarpur valley shows the predominance of clay over sandy layers (Figure 4.8 & 4.10; Annexure - II & III). Up to 300 m depth, four to five granular zones are occurring. The thickness of these granular zones varies from 5 – 20 m.

The sub-surface conFigureuration in Kamalpur-Ambassa-Gondacherra valley reveals the high variation in the facies laterally as well as vertically (Figure 4.5& 4.6; Annexure - II & III). It is also evident that clay is dominating in the middle portion of the valley as compared to the southern parts of the valley. Generally, down to 300 m bgl depth four granular zones are occurring viz. (i) 5 - 30 mbgl, (ii) 50 - 65 mbgl (iii) 80 - 120 mbgl and (iv) 130 - 240 mbgl. The deeper aquifer from 80 m below ground level are confined and exhibit artesian condition around Abhanga and Ambassa, while the Shallow aquifer are found under unconfined to semi-confined conditions.

Sub-surface set-up in Kailasahar-Chawmanu and Dharmanagar-Machmara valley shows the wide litho-facies variation both laterally and vertically (Figure 4.2, 4.3 & 4.4; Annexure - II & III). Aquifer at shallow depth is not persistent. However, in deeper zones it is persistent, but at different levels, it is discontinuous due to presence of three inferred faults. These faults, one at south of Trilokpara, second at Gaurnagar and the third one at south of South Irani, have resulted in wide and abrupt lateral variation of litho-facies. Both the shallow and deep aquifers around Kailashahar show artesian condition. Analysis of aquifer performance test data of the exploratory/deposit wells has shown that transmissivity ranges from 4.5 to 1577 m^2/day and permeability from 0.1 to 28.4 m/day. Storage Co-efficient ranges from 2.25 x 10^{-5} to 2.20 x 10^{-3} showing confined nature of the aquifers.

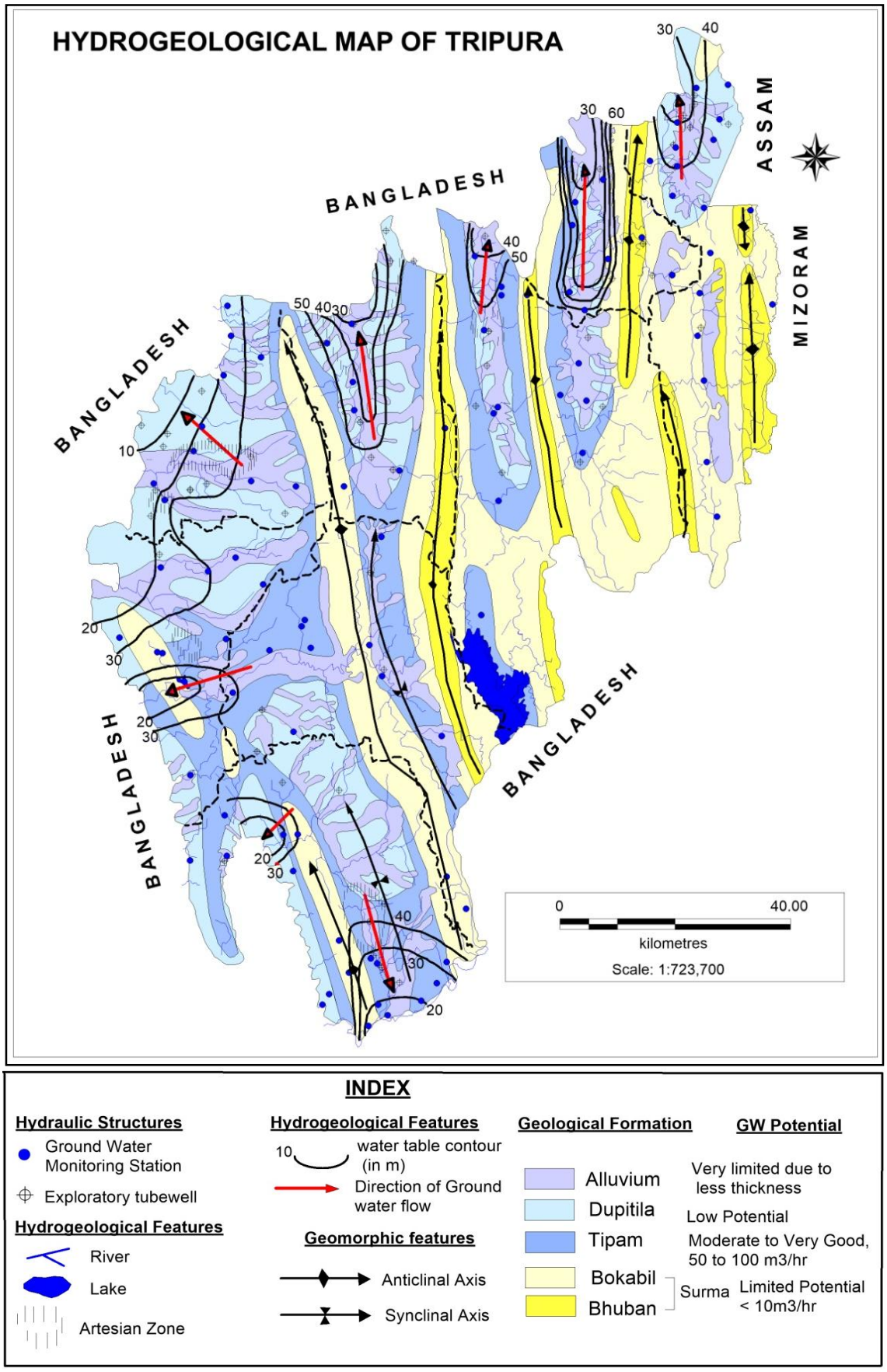


Figure 5.1: Hydrogeological Map of Tripura

Table 5.1 Aquifer Disposition and Groundwater Potential of Tripura

Age	Group		Formation	Lithology	Aquifer Disposition	Ground Water Potential
Quater-nary	Un- consoli-dated	Recent	Recent Alluvium	Clay, Silt and Sand	Limited thickness along river valleys	Yield Prospects very limited due to superficial thickness
Upper Tertiary	Semi Consolidated	Dupitila	Dupitila	Coarse to gritty Sandstone with dominated Clay layers	Forms Unconfined aquifer in dug well zones near surface. Maximum thickness: 30 m	Limited yield prospect due to poor permeability
		Tipam	Champaknagar/ Manu Bazar	Fine to coarse Sandstone with intercalations of Shale layers	Forms major aquifer system for shallow and deep tube wells up to 300 m depth at favourable locations.	Moderate yield prospect, yields varies from 20 to 150 m^3/hr for drawdown up to 30 m
		Surma	Bokabil/ Bhuban	Thinly bedded Sandstone, Siltstone and Shale	Occurs on anticlinal hill ranges	Not potential for ground water development, due to argillaceous nature of formations

5.4 DEPTH TO WATER LEVELS

The ground water occurs in unconfined condition in the shallow aquifer and in semi confined to confined condition in deeper aquifer. The Pre-Monsoon Water Levels have been recorded/measured in the month March, where as the Post Monsoon Water levels have been recorded in the month of November. The principal aquifer is Tipam sandstone. The district wise seasonal variation of depth to water level is given below:

a. **North Tripura District:** Depth to water level during March, 2022 monitored from dug wells ranges from 1.05 to 6.93 m bgl while in Nov, 2022 ranges from 0.68 to 6.51 m bgl in Satnala and Laljuri respectively.

b. **Unakoti District:** Depth to water level during March, 2022 monitored from dug wells ranges from 2.51 to 7.55 m bgl in Kanchanbari and Pecharthal respectively while in Nov, 2022 depth to water level ranges from 1.35 to 6.71 m bgl in Jarulthali and Kumarghat respectively.

c. **Dhalai District:** Depth to water level during March, 2022 monitored from dug wells ranges from 1.16 to 7.91 m bgl in Chawmanu and Ambassa respectively while in Nov, 2022 depth to water level ranges from 0.78 to 6.23 m bgl in Durga chowmuhani and Ambassa respectively.

d. **Khowai District:** Depth to water level during March, 2022 monitored from dug wells ranges from 2.03 to 7.46 m bgl in Khowai and Kathalbari respectively while in Nov,

2022 depth to water level ranges from 1.98 to 7.38 m bgl in Khowai and Tuimadhu respectively.

e. **West Tripura District:** Depth to water level during March, 2022 monitored from dug wells ranges from 1.93 to 7.43 m bgl in Sadhupara and Chandmari respectively while in Nov, 2022 depth to water level ranges from 0.55 to 5.39 m bgl in Sadhupara and Khumlung respectively.

f. **Sepahijala District:** Depth to water level during March, 2022 monitored from dug wells ranges from 2.25 to 4.77 m bgl in Golaghati and Shivnagar respectively while in Nov, 2022 depth to water level ranges from 0.54 to 3.63 m bgl in Konaban and Tufaniamura respectively.

g. **Gomati District:** Depth to water level during March, 2022 monitored from dug wells ranges from 1.04 to 10.30 m bgl while in Nov, 2022 ranges from 0.92 to 9.48 m bgl in Joingkami and Kakraban respectively.

h. **South Tripura District:** Depth to water level during March, 2022 monitored from dug wells ranges from 0.75 to 8.63 m bgl in Manurmukh and Baishnabpur respectively while in Nov, 2022 depth to water level ranges from 0.98 to 6.89 m bgl in Manurmukh and Barkashari respectively.

6.0 GROUND WATER EXPLORATION

The Central Ground Water Board (CGWB) has started ground water exploration in Tripura 1976.

6.1 OBJECTIVES OF GROUND WATER EXPLORATION

i. The following are the objectives of ground water exploration:
ii. To discover and establish the presence / absence of aquifer system at various depths at different hydrogeological settings.
iii. To determine the disposition of various aquifers and their geometry.
iv. To determine hydraulic characteristics of various aquifers and their hydraulic parameters.
v. To find the quality of ground water and its variation with depth.
vi. To assess the recoverable ground water resources in a scientific manner.
vii. To assess potentialities of lineaments etc. in hard rocks.
viii. To evaluate appropriate well design for a given hydro geological set up.

6.2 NEED FOR GROUND WATER EXPLORATION

Our demand for water is constantly increasing due to growth in population. The population of India has increased to 140 crores by 2022 from 23.9 crores in 1901. As stated above, the fresh water is available both as ground water and as surface water

The following are the attributes of ground water:

i. There is more ground water available than surface water.
ii. Ground water is less expensive.
iii. It is an economic resource.
iv. Generally, a superior source of water supply.
v. Needs no treatment for domestic or industrial use.
vi. It has constant temperature.
vii. Turbidity and colour absent.
viii. Relatively less vulnerable to pollution
ix. Key to life in semi-arid and arid regions.
x. It is usually of high bacteriological purity
xi. Less vulnerable to drought conditions.
xii. It is ubiquitous and available in many areas lacking dependable surface water supply.
xiii. No conveyance losses in ground water based water supplies.
xiv. It is sustainable and reliable source of water supply.
xv. Can be instantly developed and readily put to use.
xvi. It has distinct health advantage as an alternative for lower sanitary quality surface water.
xvii. A source of dry weather flow in streams and rivers.

xviii. In addition to increase population, improved standards of living have increased the demand for water.

xix. Scientifically, attention today is primarily directed towards the ground water compared to surface water. Many surface and sub-surface exploration projects are under taken with the aim of locating recoverable ground water.

6.3 METHODOLOGY OF GROUNDWATER EXPLORATION

6.3.1 Site Selection and Pin Pointing

The selection of site is normally done in consultation with the user agencies. The site is generally located in the Government land and availability of good approach to the site.

The sites are pinpointed by the representatives of the hydrogeological and drilling wings of CGWB and the user agency.

6.3.2 Drilling

The common types of Rigs deployed by the Central Ground Water Board areas follow:

i. **Direct Rotary Rig: T**his Rig is generally deployed in the alluvial and sedimentary area.

ii. **Percussion or Down the Hole Hammer (DTH):** This Rig is deployed in Hard rock areas.

iii. **Combination Rig:** This rig is capable of drilling to rotary and percussion methods and is deployed in such areas where hard rocks occur beneath an appreciable thickness of unconsolidated or semi consolidated formations.

Entire Tripura has immature geology and comes under soft rock areas. The ground water exploration in these formations would involve establishing the presence, thickness and water bearing properties of granular beds and their depth of occurrence. The target depth of 300 m below ground level was fixed in general for these areas, which was, however, varied depending on the thickness of these deposits, capacity of the drilling rig and other factors. Normally one or more observation wells are drilled at suitable distances, if the yield from the exploratory well is over 3 lps.

Success of ground water exploration in these formations involves tapping granular formations. However, sites located close to lineaments would, also be able to derive yield from the fracture zones, which impart secondary porosity to these formations. Therefore, a study of aerial photographs and satellite imageries would help in proper site selection in these terrains also.

As these formations are usually soft, friable and tend to collapse, these are drilled through by deploying a Direct Rotary drilling rig using Bentonite mud as the drilling fluid. The rig is positioned on the pinpointed site and is leveled. The pilot borehole drilling commences with a drilling bit of suitable size, normally of a smaller diameter. After the pilot borehole has penetrated through the topsoil and the weathered zone, the borehole is reamed to a suitably larger diameter to facilitate the installation of a surface pipe, with a 'T' joint. The function of the surface pipe, which is also known as conductor pipe, is to prevent collapsing of the weathered topsoil, which would interfere

with the drilling of the pilot borehole. The 'T' pipe ensures that the drill cuttings coming out during the drilling, reach the sample catcher, to enable collection of proper, representative samples.

Further, drilling of pilot hole is carried out till the target depth or the basement is reached. Samples of the drill cuttings are collected at periodic intervals, say 3 m or whenever there is a change in the formation being drilled through. From a study of these drill cuttings, the penetration rate of the drill bit, changes in the viscosity and colour of the drilling fluid, the finalized lithological log of borehole is prepared.

If productive granular zones are encountered in the pilot borehole, it is decide to convert the pilot hole into a test well, by installation of well screens. Reaming of the borehole is then carried out to a suitable diameter. Installation of the tube well assembly consists of positioning of slotted pipes against the aquifer zones and blank pipes against unproductive zones like clay, shale, etc.

The annular space between the borehole wall and the assembly pipes is packed with uniform, well rounded, hard and graded, quartz gravel. The tube well thus constructed is then developed by various methods such as jetting, surging, back washing, etc., using an air compressor. The purpose of developing a tube well is to remove the Bentonite mud, which is used during rotary drilling. The development is done till sand and mud-free water is obtained.

The duration of well development by the air compressor is required to be longer, if during the drilling a long time had been taken to complete the pilot borehole, or if the Bentonite mud had been allowed to stand in the borehole for long, due to one reason or the other. In such a situation, mud invasion into the borehole walls and/or formation of mud cakes is resulted, which require to be removed completely, during the development. Unless all the mud is removed by the development the pore spaces would remain choked, resulting in a poor yield from the tube well.

When the water coming out during the compressor development becomes totally sand and mud-free, further development is done by over pumping, using a turbine or submersible pump.

When the development with pump is completed, the aquifer tests, commonly referred to as pump tests, are conducted on the tube well. Normally a Step Draw Down Test (SDT) is conducted on the well, when the discharges from the well are increased step by step and the pump is run for short duration, under each step. Different parameters like specific capacity, formation and well loss coefficients, well efficiency, etc., are determined by the analysis of SDT data. Optimum yield of a tube well and the projected discharges for a desired draw down are also computed from the analysis of the SDT data.

This is followed by an Aquifer Performance Test (APT) in which the discharge from the tube well is kept at a constant rate and the pump is run for a short or long duration (100 to 10,000 minutes depending on the nature of the aquifer). Water levels are monitored from the test well and the observation wells, during pumping and after stoppage of pumping, which would constitute the draw down and recovery data, respectively.

On analysis of the APT data, hydraulic parameters like Transmissivity (T), Field Permeability (P) and Storage Coefficient (S) are determined, by applying the method to suit the nature of the aquifer tapped. During the pump tests, water samples are collected which are later analysed to determine the various chemical constituents present in the water. From the analytical results, the suitability of the water for different uses like drinking, irrigation or industrial purposes is determined.

Reporting the Findings: The well is deemed completed on completion of pumping tests. A report, referred to as the Basic Data Report (BDR), is compiled for each borehole, containing the salient features of the exploratory borehole and details of various drilling operations done at the site. The BDR also contains recommendations for optimum pumping rate, the type of pump to be fitted, the depth at which it should be installed, the likely pumping water levels for the desired discharges, etc.

Cost calculations of exploratory tube wells are done. On completion of the above, the well is classified as per the norms fixed by the Government of India, viz, as 'A', 'B' and 'C', based on the yield and the draw down.

6.4 GROUNDWATER EXPLORATION IN TRIPURA

Groundwater exploration was commenced in the state as early as 1976 and continued till 2018. Under Groundwater Exploration Programme and Aquifer Mapping Programme 65 EW, 26 OW, 2 SH and 9 Deposit Wells were constructed in the state down to maximum depth of 300m. The detailed locations of exploratory wells drilled under Central Ground Water Board is given in **Annexure-I**. The lithological logs of some of the Exploratory Wells/tube wells constructed are given in **Annexure-II**. The hydrogeological details of exploratory wells are given in **Annexure-III** and the Pumping test results are at **Annexure-IV**. Some of the locations are shown in Figure. 6.1.

Table 6.1: Number of Exploratory and associated drilling carried out in each districts of Tripura

Sl No	Dist	EW	OW	Deposit	Slim	Total Location/Site	Total Wells Including OW
1	Dhalai	9	2			9	11
2	North Tripura	8	1	1		9	10
3	Unakoti	5	2		1	6	8
4	Gomati	6	2	2		8	10
5	South Tripura	12	5	1		13	18
6	Khowai	8	3			8	11
7	West Tripura	13	9	4		17	26
8	Sepahijala	4	2	1	1	6	8
	Total	65	26	9	2	76	102

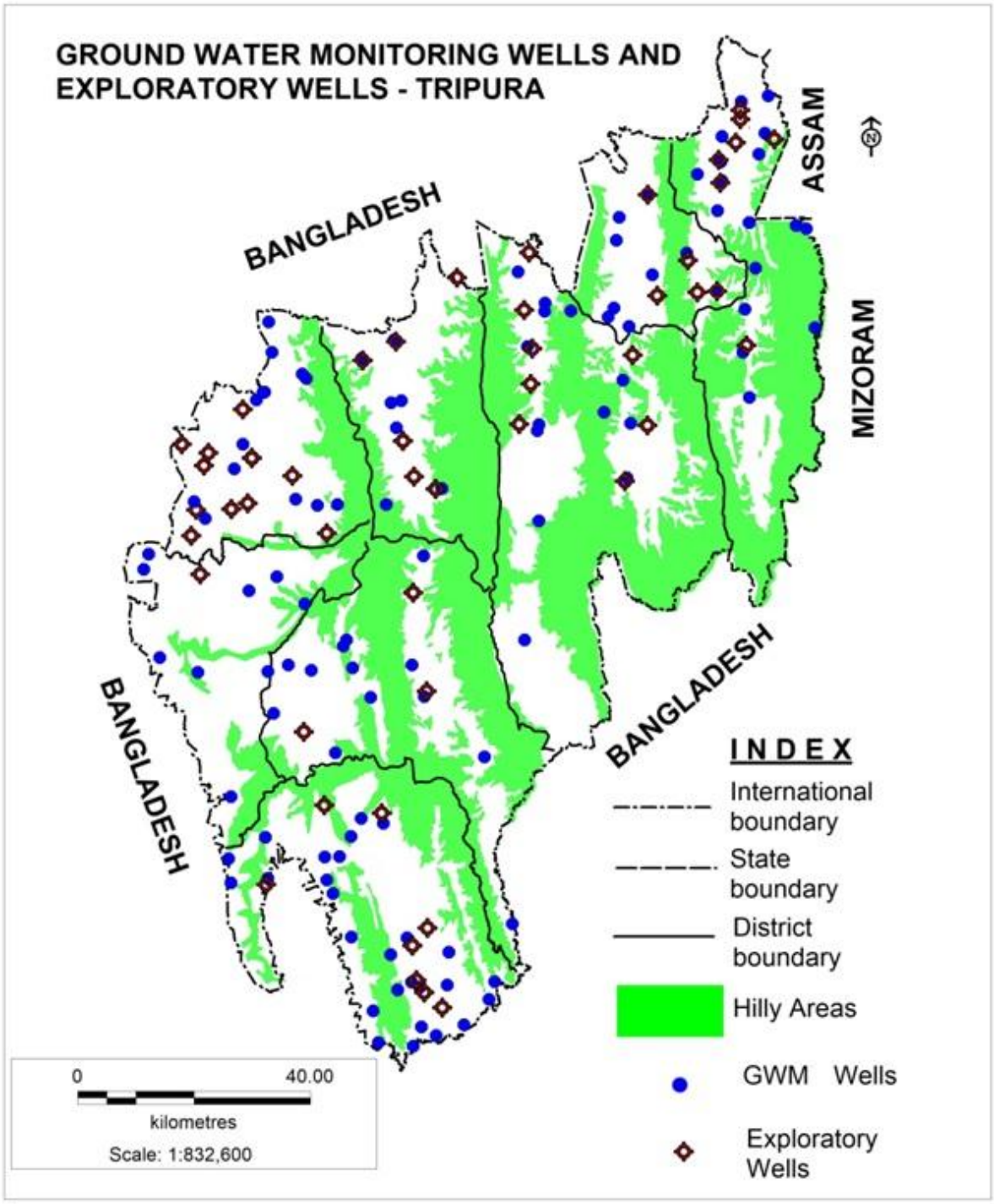


Figure 6.1 : Map showing the locations of Exploratory Wells by CGWB and GWMWs (up to January 2023)

6.4.1 Ground Water Exploration in North Tripura district

North Tripura district is situated between North Latitudes 23°39'7'' and 24°31'55'' and East Longitude 92°6'21'' to 92°20'8'' falling in the Survey of India degree sheet number 83D and 84A. It is bounded by Mizoram and Assam in the east, Bangladesh on north and northwestern sides, Unakoti on the west and Dhalai district on southwestern sides. The total geographical area of North Tripura District is **1444.50 sq.km.** Dharamnagar is the district headquarters of North

Tripura district. Administratively, the district is divided into 3 nos. of sub–divisions which are in turn sub-divided into 8 nos. of blocks, 1 municipal council and one nagar panchayat. There are 70 nos. of gram panchayats and 60 Autonomous District Council (ADC) villages in the district.

As per 2011 census, the total population of the district is **4,17,441** persons with a density of 289 persons/ sq.km. Forests cover **846.57 sq.km (58.60%)** of the total geographic area of the district.

Ground Water Exploration

Under Ground Water Exploration programme CGWB has constructed 10 wells in 9 locations (8 EW, 1 OW & 1 Deposit Well) in the district, down to a maximum depth of 255 m bgl tapping Tipam sandstone to determine the aquifer characteristics of the deeper aquifer.

Dharmanagar valley: In the valley 8 nos. of exploratory wells were drilled in the depth range of 198 to 255 m. The discharge of the wells varies from 4 to 95 m^3/hr (1 to 26 lps) and the drawdown varies from 4 to 42 m. The transmissivity of the wells varies from 6 to 627 m^2/day, permeability varies from 0.1 to 12.6 m/day and storativity lies in the range of $2.7x10^{-4}$. Exploratory wells constructed at Ichaicherra, Nayapasra, are found to be in flowing / artesian condition. The piezometric head measured varied from 0.42 to 2.34 m agl.

Kanchanpur Valley: In the valley, 1 EW & 1 OW has been drilled at kanchanpur with the depth of 92.3 mbgl. The discharge of the well is 48 m^3/hr (13.33lps) at the drawdown of 4.84m. The transmissivity of the well is 234.27.

Springs / seepage zones : Springs / seepage zones are available in the area. Traditionally tribal people living in the hilly areas are using spring water for drinking and domestic purposes. In the foothill areas people used to arrest the spring water by constructing seasonal / permanent bund on small streamlets / cherras and used this water for irrigation purpose and sometimes used for drinking and domestic purposes also. In Kadamtala seepage zones occur in paddy fields. In hilly areas of Damcherra, and Jampui hill blocks it is reported that springs are available.

Artesian zones: A few artesian zones occur in the district. These wells are mainly used for drinking and domestic purposes but some of the wells are even used for irrigation purposes. Artesian zones are found in Kadamatala, Panisagar, Dasda and Damcherra blocks. The artesian zones found are discontinuous and are localized phenomenon. It is reported that the wells are constructed within a depth range of 10 to 100 m bgl. Discharge of the wells varies from 0.01 to 0.83 lps during pre-monsoon period and from 0.02 to 1.00 lps during post-monsoon period.

Table 6.2: The hydrogeological parameters details of exploratory wells drilled in the North Tripura District.

North Tripura	Min	Max
No. of wells drilled	10	
Depth range (m, bgl)	92	255
Thickness of aquifer tapped (m)	24	63
Discharge (lps)	1.08	26.5
Drawdown (m)	4.3	41.73
Specific capacity (lpm/mdd)	2.7	87.2

Transmissivity (m^2/day)	5.7	627
Permeability (m/day)	0.1	12.6
Storativity	$2.7x10^{-4}$	

6.4.2 Ground Water Exploration in Unakoti district

Unakoti district is situated between North Latitudes 24º23'30" and 24º5'37'' and East Longitude 91º55'48'' and 92º12'06'' falling in the Survey of India degree sheet number 78P and 79M. It is bounded by North Tripura district in the east and south east, Bangladesh on west and northwestern side, Dhalai district on west and southwestern sides. The total geographical area of Unakoti District is **591.93 sq.km.** Kailashahar, the district headquarters of Unakoti district. Administratively, the district is divided into 2 nos. of sub–divisions Kailashahar and Kumharghat which are in turn sub-divided into 4 nos. of blocks. There are 59 nos. of gram panchayats and 32 Autonomous District Council (ADC) villages in the district.

As per 2011 census, the total population of the district is **2,76,506** persons with a density of 467 persons/ sq.km. Forests cover **376.74 sq.km (63.64%)** of the total geographic area of the district.

Ground Water Exploration

Under Ground Water Exploration programme CGWB has constructed 8 wells in 6 locations (5 EW, 2 OW & 1 Slim Hole) in the district down to a maximum depth of 300m bgl tapping Tipam sandstone to determine the aquifer characteristics of the deeper aquifer. But two of them were abandoned due to lack of granular zone.

Dharmanagar valley: In the valley, 2 nos. of exploratory wells were drilled in the depth range of 293 to 300. The discharge of the wells varies from 14.9 to 91 m^3/hr (4.16 to 25.29 lps) and the drawdown varies from 18.44 to 29.5 m. The transmissivity of the wells varies from 4.5 to 222 m^2/day, permeability varies from 0.1 to 5.8 m/day and storativity is in the range of $4.20x10^{-4}$. Exploratory wells constructed at Pecharthal are found to be in flowing / artesian condition. The piezometric head was measured at 2.85 magl.

Kailasahar valley: In the valley, 3 nos. of exploratory wells were drilled in the depth ranges from 250 to 300 m. In South Irani a pilot hole was drilled up to 300 m bgl but due to lack of granular zone it was abandoned. The discharge of the wells varies from 85 to 90 m^3/hr (23.65 to 25.11 lps) and the drawdown varies from 6.7 to 25.75 m. The transmissivity of the wells varies from 189 to 1213 m^2/day, and the permeability varies from 3.5 to 24 m/day.

Kanchanpur Valley: In the valley, only 1 no. of pilot hole was drilled in Karaicherra upto 116.60 m bgl but due to lack of granular zone it was abandoned.

Springs / seepage zones: Springs / seepage zones are available in the area. Traditionally tribal people living in the hilly areas are using spring water for drinking and domestic purposes. In the foothill areas people used to arrest the spring water by constructing seasonal / permanent bund on small streamlets / cherras and used this water for irrigation purpose and sometimes used for

drinking and domestic purposes also. In Gournagar and Kumarghat seepage zones occur in paddy fields. In hilly areas of Pecharthal blocks it is reported that springs are available.

Artesian zones: A few artesian zones occur in the district. These wells are mainly used for drinking and domestic purposes but some of the wells are even used for irrigation purposes. Artesian zones are found in Panisagar and Gournagar blocks. The artesian zones found are discontinuous and are localized phenomenon. It is reported that the wells are constructed within a depth range of 10 to 100 m bgl. Discharge of the wells varies from 0.01 to 0.83 lps during pre-monsoon period and from 0.02 to 1.00 lps during post-monsoon period.

Table 6.3: The hydrogeological parameters details of exploratory wells drilled in the Unakoti District.

Unakoti District	Min	Max
No. of wells drilled	8	
Depth range (m, bgl)	250	300
Thickness of aquifer tapped (m)	42	55
Discharge (lps)	4.16	25.29
Drawdown (m)	6.7	29.5
Specific capacity (lpm/mdd)	8.46	226
Transmissivity (m^2/day)	4.5	1213
Permeability (m/day)	0.1	23.7
Storativity	4.2×10^{-4}	2.2×10^{-3}

6.4.3 Ground Water Exploration in Dhalai district

The Dhalai district is situated between North Latitudes $24^0 15'$ and 23º24/38// and East Longitudes 91º45/ and 92º15/ falling in the Survey of India degree sheets nos. **78P, 79M, 83D and 84A**. It is bounded by Bangladesh on the North and South, North Tripura district in the east, Khowai and Gomati District in the west. The total geographical area of the district is 2313 sq.km. The district headquarter is Ambassa. Administratively, the district is divided into 4 nos. of sub–divisions which are further sub-divided into 8 nos. of blocks. There are **41** gram panchayats and **110** Autonomous District Council (ADC) villages in the district.

As per 2011 census, the total population of the district is 3,78,230 persons with a density of 158 persons/ sq. km. Forests cover **1859.40 sq.km (80 %)** of the total district.

Ground Water Exploration

Under Ground Water Exploration programme, CGWB has constructed 11 wells in 9 locations (9 EW & 2 OW) in the district down to a maximum depth of 305 m bgl tapping Tipam sandstone to determine the aquifer characteristics of the deeper aquifer.

Kamalpur valley: In this valley 6 EW well were constructed under exploratory, piezometer NAQUIM programmes. The exploratory tube wells at Kamalpur, Durai-Sibbari and Santirbazar up to a maximum depth of 250m have revealed the predominance of argillaceous sediments and lack of sufficient granular zones, but tube wells situated at Abhanga and Bhatkhowri close to central parts of the valley have shown good prospective zones. Transmissivity of aquifers

around Abhanga and Bhatkhowri was 1582 m^2/day and 1186 m^2/day respectively.The discharge of the wells varies from 36.02-46.50 lps and the drawdown varies from 14.73-28.14 m. The permeability varies from 26.9 -40.4 m/day and storativity is 2.85 x 10^{-4}.

Manu valley: In this valley 3 EW were constructed. The maximum depth drilled is 300 m bgl tapping Tipam sandstone to determine the Characteristics of the deeper aquifer. The discharge of the wells varies from 10.52 to 58.48 lps and the drawdown varies from 18.22-38.36 m. The transmissivity of the wells varies from 26.4 - 603 m^2/day, permeability varies from 0.52-10.35 m/day and storativity is 5.89 x 10^{-4}.

Artesian zones: A few artesian zones occur in the district. These wells are mainly used for irrigation purposes but a few of the wells are even used drinking and domestic purposes also. Artesian zones are found in Ambassa, Salema, Dumburnagar, Manu and Chawmanu Blocks. The artesian zones found are discontinuous and are localized phenomenon**.**

Table 6.4: The hydrogeological parameters details of exploratory wells drilled in the Dhalai District.

Dhalai District	Min	Max
No. of wells drilled	11	
Depth range (m, bgl)	240	305
Thickness of aquifer tapped (m)	36	60
Discharge (lps)	10.52	59.86
Drawdown (m)	14.73	38.36
Specific capacity (lpm/mdd)	16.4	189.8
Transmissivity (m2/day)	26.4	1582.1
Permeability (m/day)	0.52	43.9
Storativity	5.89x10^{-4}	2.85x10^{-4}

6.4.4 Ground Water Exploration in Khowai district

The Khowai district is situated between North Latitudes 23º40′48″ and 24º13′39.56″and East Longitudes 91º32’7.44’’ and 91º46’22.08’’ falling in the Survey of India degree sheets nos.**79M and 78P**. It is bounded by Bangladesh on north,West Tripura on the western sides, Gomati district in the south and Dhalai district on eastern side. The total geographical area of the district is 1005.67 sq.km. The district headquarter is located at Khowai. Administratively, the district is divided into 2 nos. of sub–divisions which are further sub-divided into 6 nos. of blocks, 2 Municipal corporation. There are **54** Gram Panchayats and **69** Autonomous District Council (ADC) villages in the district.

As per 2011 census, the total population of the district is 3,27,564 persons with a density of 326 persons/ sq. km. Forests cover 543 sq.km (54%) of the total district..

Ground Water Exploration

Under Ground Water Exploration programme CGWB has drilled 11 wells in 8 locations (8 EW & 3 OW) down to a maximum depth of 302 m bgl tapping Tipam sandstone to determine the aquifer characteristics of the deeper aquifer.

Khowai valley: In this valley 8 EW, 3 OW were constructed so far under exploratory programme. The maximum depth drilled is 302 m bgl tapping Tipam sandstone to determine the characteristics of the deeper aquifer. The discharge of the wells varies from 4.4 to 22.52 lps and the draw down varies from 5.3-13.6 m. The transmissivity of the wells varies from 1047- 1689 m^2/day, permeability varies from 15.52 - 28.4 m/day. The tube wells drilled at Khowai, Ashrambari and Bonbazar are auto flowing.

Springs / seepage zones: Springs / seepage zones are available in the district. Traditionally tribal people living in the hilly areas are using spring water for drinking and domestic purposes. In the foothill areas people arrest the spring water by constructing seasonal / permanent bund on streamlets / cherras and used this water for irrigation purpose and sometimes used for drinking and domestic purposes also. In hilly areas of Mungiakami blocks springs are available.

Artesian zones: A few artesian zones occur in the district and are depicted in fig.3. These wells are mainly used for irrigation purposes but a few of the wells are even used drinking and domestic purposes also. Artesian zones are found in Khowai, Kalyanpur, Teliamura blocks. The artesian zones found are discontinuous and are localized phenomenon. It is reported that the wells are constructed within a depth range of 10 to 125 m bgl. Discharge of the wells varies from 0.1 to 1.00 lps.

Table 6.5: The hydrogeological parameters details of exploratory wells drilled in the Khowai District.

Khowai District	Min	Max
No. of wells drilled	11	
Depth range (m, bgl)	128	302
Thickness of aquifer tapped (m)	24	71
Discharge (lps)	4.4	22.52
Drawdown (m)	5.3	13.6
Specific capacity (lpm/mdd)	44.6	217
Transmissivity (m^2/day)	1047	1689
Permeability (m/day)	15.52	28.4
Storativity	-	

6.4.5 Ground Water Exploration in West Tripura District

The West Tripura district is situated between North Latitudes $23^0 45'$and $24^0 5' 34.8''$ and East Longitudes $91^0 14'$ and $91^0 32'$ falling in the Survey of India degree sheets nos. **78P and 79M**. It is bounded by Bangladesh on the North and West, Khowai district in the east and Sepahijala District in the South. The total geographical area of the district is 1045.96 sq.km. The state capital as well as district headquarter is Agartala. Administratively, the district is divided into **3** nos. of sub–divisions which are further sub-divided into **9** nos. of blocks. There are **87** gram panchayats and **85** Autonomous District Council (ADC) villages in the district.

As per 2011 census, the total population of the district is 9,18,200 persons with a density of 974 persons/ sq. km. Forests cover **292.65 (27%)** km of the total district.

Ground Water Exploration

Under Ground Water Exploration programme, CGWB has drilled 26 wells in 17 locations (13 EW, 9 OW & 4 Deposit Wells) in the district down to a maximum depth of 281 m bgl tapping Tipam sandstone to determine the aquifer characteristics of the deeper aquifer.

Agartala valley: The maximum depth drilled is 281 m bgl tapping Tipam sandstone to determine the Characteristics of the deeper aquifer. The discharge of the wells varies from 0.22 to 46 lps and the drawdown varies from 0.5-30.53 m. The transmissivity of the wells varies from 86.67 to 6859 m^2/day, permeability varies from 2.93 – 134.5 m/day and storativity varies from 7.5 x 10^{-4} to 2.06 x 10^{-3}

Artesian zones: A few artesian zones occur in the district. These wells are mainly used for irrigation purposes but a few of the wells are even used drinking and domestic purposes also. Artesian zones are found in Dukli, Mohanpur and Jirania blocks. The artesian zones found are discontinuous and are localized phenomenon. In Agartala valley artesian wells are reported to be constructed within a depth range of 5 to 67 mbgl. The piezometric head varies from 0.05 to 2.10 magl. Discharge varies from 0.05 to 0.75 lps during pre-monsoon and from 0.10 to 0.75 lps during post monsoon.

Table 6.6: The hydrogeological parameters details of exploratory wells drilled in the West Tripura District.

West Tripura District	Min	Max
No. of wells drilled	26	
Depth range (m, bgl)	190	281
Thickness of aquifer tapped (m)	24	64
Discharge (lps)	0.22	46
Drawdown (m)	0.5	30.53
Specific capacity (lpm/mdd)	10.3	217
Transmissivity (m^2/day)	86.67	6859
Permeability (m/day)	2.93	134.5
Storativity	$7.5x10^{-4}$	$2.06x10^{-3}$

6.4.6 Ground Water Exploration in Sepahijala district

The Sepahijala district is situated between North Latitudes 23º17′15″ " and 23º45′51″ and East Longitudes 91º9′50″ and 91º33′56″ falling in the Survey of India degree sheets nos. **79M**. It is bounded by Bangladesh on the west, south Tripura district on south, Gomati district on eastern side and West Tripura in the north. The total geographical area of the district is 1044.78 sq.km. The district headquarter is Bishramganj. Administratively, the district is divided into 3 nos. of sub–divisions which are further sub-divided into 7 nos. of blocks. There are **111** gram panchayats and **58** Autonomous District Council (ADC) villages in the district. The map showing administrative divisions is shown in Fig-1.

As per 2011 census, the total population of the district is 4,83,687 persons with a density of 463 persons/ sq. km. Forests cover 309.96 sq. km (30%) of the total district.

Ground Water Exploration

Under Ground Water Exploration programme CGWB has drilled 8 wells in 6 locations (4 EW, 2 OW, 1 Deposit Well & 1 Slim Hole) down to a maximum depth of 270m bgl tapping Tipam sandstone to determine the aquifer characteristics of the deeper aquifer.

Agartala – Sonamura valley: In this valley 4 EW, 2 OW, 1 Slim hole and 1 Deposit well were constructed under exploratory, piezometer and deposit well programmes. The maximum depth drilled is 270 m bgl tapping Tipam sandstone to determine the Characteristics of the deeper aquifer. The discharge of the wells varies from 2.87 to 31.41 lps and the drawdown varies from 4.95 – 27.94 m. The transmissivity of the wells varies from 90.9 to 1438m^2/day, permeability varies from 1.83 – 32.92 m/day and storativity varies from 4.4 x 10^{-4} to 2.6 x 10^{-3}.

Artesian zones: A few artesian zones occur in the district. These wells are mainly used for irrigation purposes but a few of the wells are even used drinking and domestic purposes also. Artesian zones are found in Bishalgarh, Boxanagar, and Melaghar blocks. The artesian zones found are discontinuous and are localized phenomenon. It is reported that the wells are constructed within a depth range of 5 to 65 m bgl. Discharge of the wells varies from 0.06 to 1.00 lps.

Table 6.7: The hydrogeological parameters details of exploratory wells drilled in the Sepahijala District.

Sepahijala District	Min	Max
No. of wells drilled	8	
Depth range (m, bgl)	200	270
Thickness of aquifer tapped (m)	40	66
Discharge (lps)	2.87	31.41
Drawdown (m)	4.95	27.94
Specific capacity (lpm/mdd)	32.1	211.7
Transmissivity (m^2/day)	90.9	1438
Permeability (m/day)	1.83	32.92
Storativity	$4.4x10^{-4}$	$2.06x10^{-3}$

6.4.7 Ground Water Exploration in Gomati district

Gomati district is situated between North Latitudes 23°05’31’’ and 23°45’56’’ and East Longitude 91°24’20.9” to 91°51’10.08” falling in the Survey of India degree sheet number 79M . The District is bounded in the East by the international boundary with Bangladesh, Sipahijala district in the west, South Tripura District in the South, Khowai District in the North and Dhalai District in the North Eastern side. The total geographical area of South Tripura District is 1522.8 **sq.km.** Udaipur is the districts headquarter of South Tripura district. Administratively, the district is divided into 3 nos. of sub–divisions which are in turn sub-divided into 8 nos. of blocks, 2 municipal

council /nagar panchayat. There are 70 nos. of gram panchayats and 103 Autonomous District Council (ADC) villages in the district.

As per 2011 census, the total population of the district is 441538 persons with a density of 290 persons/sq.km. Forests covers 1007.04 (66%) of the total geographic area of the district.

Ground Water Exploration

Under Ground Water Exploration programme CGWB has drilled 10 wells in 8 locations (6 EW, 2 OW & 2 Deposit Wells) in the district down to a maximum depth of 255m bgl tapping Tipam sandstone to determine the aquifer characteristics of the deeper aquifer.

Udaipur valley: In the valley, 3 nos. of exploratory wells were drilled in the depth range of 200 to 247m. The discharge of the wells varies from 36 to 112 m^3/hr (10 to 31.11 lps) and the drawdown varies from 6.8 to 24 m. The transmissivity of the wells varies from 246 to 330 m^2/day, permeability varies from 4.8 to 9 m/day. Exploratory wells constructed at Tulamura and Dhupthali are found to be in flowing / artesian condition. The piezometric head measured varied from 1.0 to 1.5 magl.

Amarpur valley: In the valley, 5 Exploratory wells were drilled in the depth ranges from 190 to 255 m. The discharge of the wells varies from 12 to 158 m^3/hr (3.33 to 44 lps) and the drawdown varies from 8.5 to 24.3 m. The transmissivity of the wells varies from 325 to 795 m^2/day, and the permeability varies from 7 to 11 m/day and storativity in the range 1.77 x 10^{-3}

Springs / seepage zones: Springs / seepage zones are available in the area. Traditionally tribal people living in the hilly areas are using spring water for drinking and domestic purposes. In the foothill areas people used to arrest the spring water by constructing seasonal / permanent bund on small streamlets / cherras and used this water for irrigation purpose and sometimes used for drinking and domestic purposes also.

Artesian zones: A few artesian zones occur in the district. These wells are mainly used for drinking and domestic purposes but some of the wells are even used for irrigation purposes. Artesian zones are found in Kakraban, Matabari and Killa blocks. The artesian zones found are discontinuous and are localized phenomenon. It is reported that the wells are constructed within a depth range of 6 to 58 m bgl. Discharge of the wells varies from 0.03 to 1.25 lps during pre-monsoon period and from 0.13 to 2.00 lps during post-monsoon period.

Table 6.8: The hydrogeological parameters details of exploratory wells drilled in the Gomati District.

Gomati District	Min	Max
No. of wells drilled	10	
Depth range (m, bgl)	190	255
Thickness of aquifer tapped (m)	27	76
Discharge (lps)	3.33	44
Drawdown (m)	6.8	24.3
Specific capacity (lpm/mdd)	78	181
Transmissivity (m^2/day)	246	794.7
Permeability (m/day)	4.8	10.43
Storativity	$1.77x10^{-3}$	

6.4.8 Ground Water Exploration in South Tripura district

South Tripura district is situated between North Latitudes 22°56'7'' and 23°45'55'' and East Longitude 91°18' to 91°59' falling in the Survey of India degree sheet number 79M and 79N. The District is bounded in the West and the South by the international boundary with Bangladesh, Sipahijala district in the north western side and Gomati District in the North Eastern side. The total geographical area of South Tripura District is 1534.2 **sq.km.** Belonia is the districts headquarter of South Tripura district. Administratively, the district is divided into 3 nos. of sub–divisions which are in turn sub-divided into 8 nos. of blocks, 3 municipal council /nagar panchayat. There are 70 nos. of gram panchayats and 70 Autonomous District Council (ADC) villages in the district.

As per 2011 census, the total population of the district is **430751** persons with a density of 281 persons/sq.km. Forests covers 1058.71 (69%)of the total geographic area of the district.

Ground Water Exploration

Under Ground Water Exploration programme CGWB has drilled 18 wells in 13 locations (12 EW, 5 OW & 1 Deposit Wells) down to a maximum depth of 253 m bgl tapping Tipam sandstone to determine the aquifer characteristics of the deeper aquifer.

Udaipur Sabroom valley: In the valley, the discharge of the wells varies from 12 to 151 m^3/hr (3.33 to 42.08 lps) and the drawdown varies from 0.75 to 25 m. The transmissivity of the wells varies from 47.4 to 1783 m^2/day, permeability varies from 0.87 to 27.4 m/day and storativity varies from $3.8x10^{-4}$ to $2.4x10^{-3}$. Exploratory wells constructed at Rajnagar, Satchand and Paschim Jalefa are found to be in flowing / artesian condition. The piezometric head measured varied from 0.42 to 2 magl.

Springs / seepage zones: Springs / seepage zones are available in the area. Traditionally tribal people living in the hilly areas are using spring water for drinking and domestic purposes. In the foothill areas people used to arrest the spring water by constructing seasonal / permanent bund on small streamlets / cherras and used this water for irrigation purpose and sometimes used for drinking and domestic purposes also. In Satchand and Rajnagar blocks many small seepage zones are present.

Artesian zones: A few artesian zones occur in the district. These wells are mainly used for drinking and domestic purposes but some of the wells are even used for irrigation purposes. Artesian zones are found in Bagafa, Kakraban, Rajnagar and Satchand blocks. The artesian zones found are discontinuous and are localized phenomenon. It is reported that the wells are constructed within a depth range of 10 to 200 m bgl. Discharge of the wells varies from 0.01 to 1.5 lps during pre-monsoon period and from 0.03 to 2.00 lps during post-monsoon period.

Table 6.9: The hydrogeological parameters details of exploratory wells drilled in the South tripura District.

South Tripura District	Min	Max
No. of wells drilled	18	
Depth range (m, bgl)	158	253
Thickness of aquifer tapped (m)	37	60
Discharge (lps)	3.33	42.08

Drawdown (m)	0.75	25
Specific capacity (lpm/mdd)	11.4	1066
Transmissivity (m^2/day)	47.4	1783.08
Permeability (m/day)	0.87	27.4
Storativity	$3.80x10^{-4}$	$2.38x10^{-3}$

7.0 GROUND WATER POTENTIAL

Based on hydrogeological situation and yield – drawdown relation, the state has been divided into three sectors 'A', 'B' and 'C'. Sector 'A' coincides with the central parts of the valleys, where large yielding tuewells for moderate drawdowns are considered feasible, while sector 'B' forms the foothill areas where small yielding tubewells at considerable drawdown are considered feasible. Lastly, sector 'C' coincides with the hills of the district which are generally not suitable for tubewells except some intermonate valleys where some very small capacity tubewells may be constructed.

7.1 SHALLOW TUBEWELLS: Shallow tubewells of small yield up to 50 m depth can be constructed through 150/l00 mm diameter well assembly tapping 20 – 30 m granular zones having 25 m housing and 10 m slotted portion. The annular space between the borehole and the well assembly should be shrouded preferably with 100 mm thick zone of pea gravels. The yield of such tubewells in sector 'A' is expected to be 15 – 20 m^3/hr at 5 -10 m drawdown and in sector 'B' the yield of such tubewells is expected to be 10 – 15 m^3/hr at drawdown 5 - 10 m. Shallow tubewells in valley portions where drawdown is less than 5 m and where non-pumping water level is less than 2 m bgl, enable the use of centrifugal pumps.

7.2 DEEP TUBEWELLS: Deep tubewells of large yield potentiality down to the depth of 300 mbgl can be constructed through 250/150 mm diameter assembly tapping 36 – 42 m granular zones with 45 – 50 m housing length in sector 'A' and with 50 – 55 m housing length in sector 'B'. The annular space between the borehole and the well assembly should be shrouded preferably with 100 – 120 mm thick zone of pea gravels.

The nature of the aquifer materials shows that gravel packing is required for construction of good tubewells. The slot size is required to be in between 0.50 -1.00 mm and size of gravel between 2 – 4 mm. Gravels for shrouding should be composed of quartz and should be sub-rounded to sub-angular. The ground water development possibilities in shallow zone within 50 mbgl and deeper zone (50 to 200 mbgl) are shown in Figure 7.1 & 7.2 respectively.

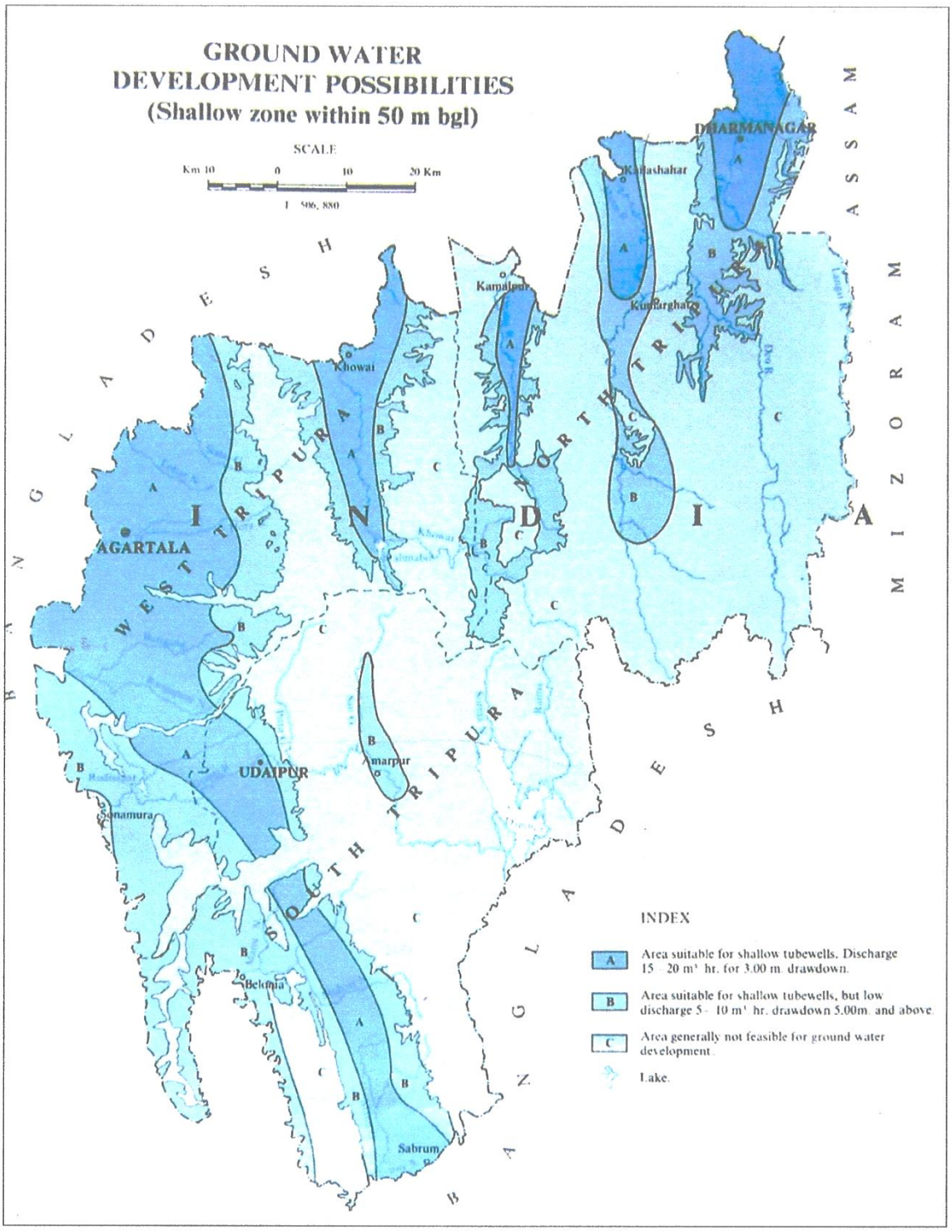


Figure 7.1 : Map showing the Ground Water development Possibilities in the shallow aquifer.

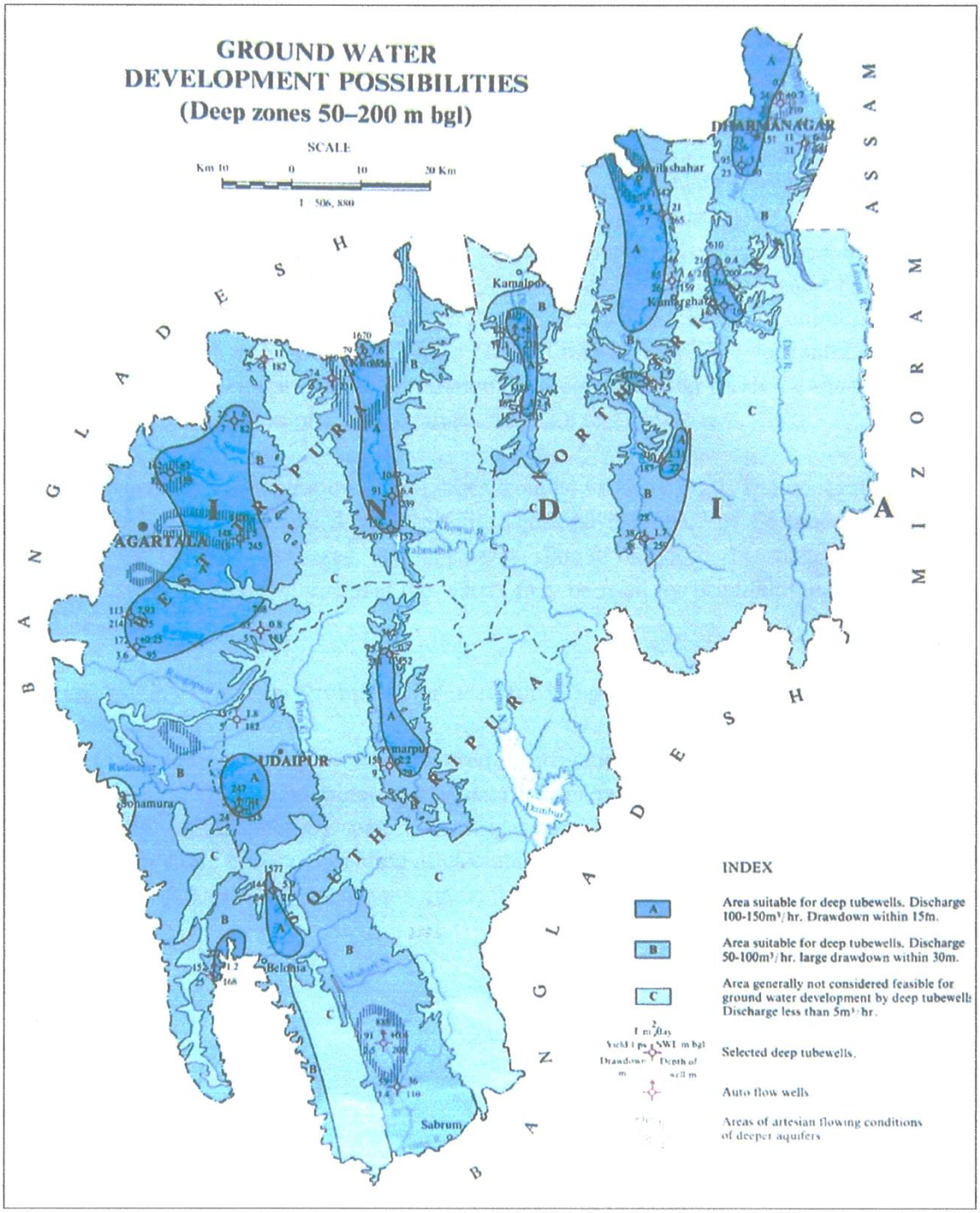


Figure 7.2 : Map showing the Ground Water development Possibilities in the deeper aquifer.

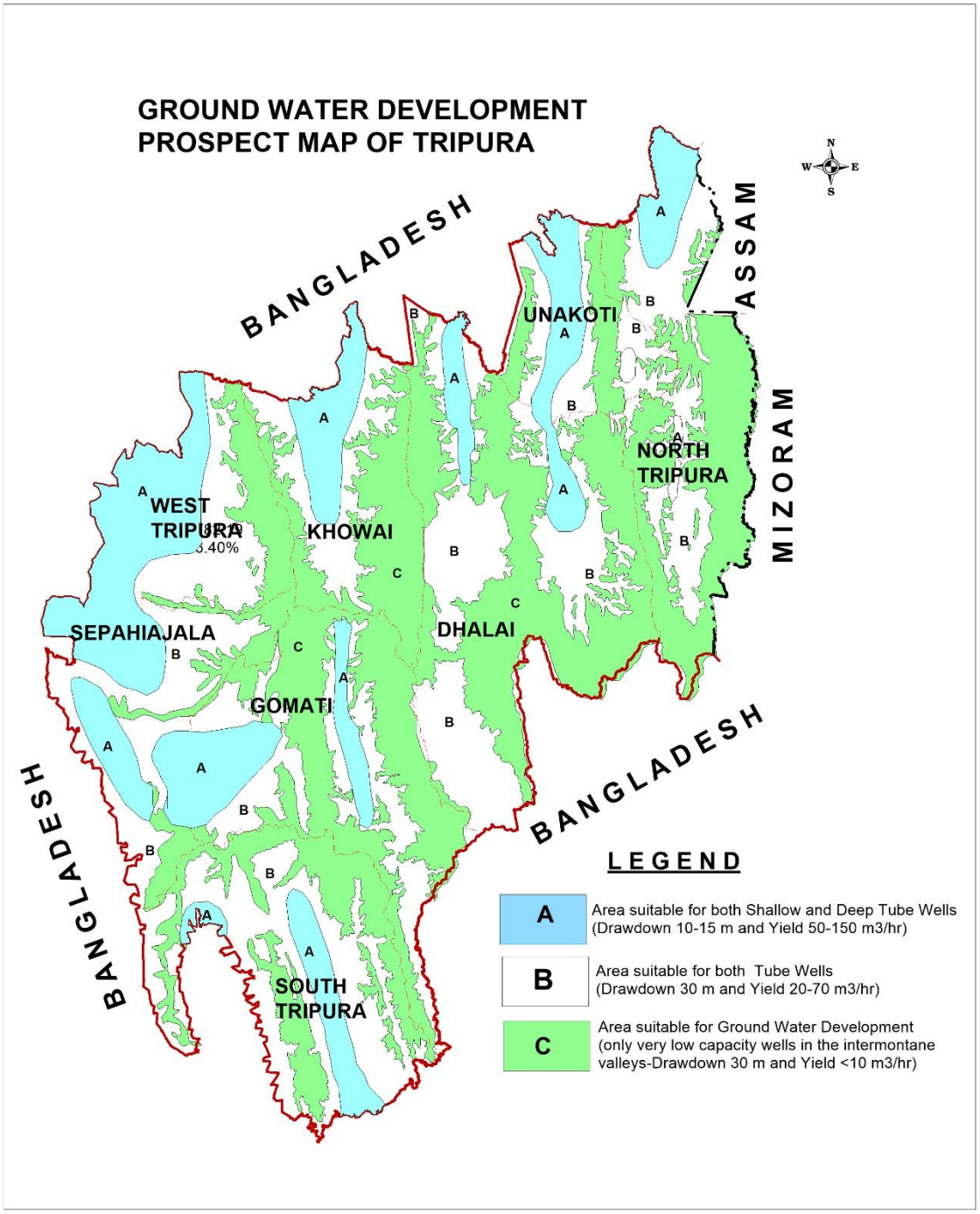


Figure 7.3 : Map showing the Ground Water development Prospect Map in both deeper and shallow aquifer.

8.0 CHEMICAL QUALITY OF DEEP GROUND WATER

Ground water samples were collected during ground water exploration and were analysed in the chemical laboratory of CGWB, NER, Guwahati and the results of partial chemical analysis of water samples were given in **Annexure-V**.

It is observed from the data that all the chemical constituents are within desirable limits except iron. The pH of deep ground water ranges from 6.3 (at Panisagar) to 8.96 (at Pechartal). It indicates that the waters are mildly acidic to alkaline in nature. The EC ranges from 40 to 449 micromhos/cm at 25° C which indicates very good quality of water. The highest EC is noticed at Chawmanu. The total hardness (TH) ranges from 5 to 100 mg/l. The concentrations of Ca and Mg ranges from trace to 50 mg/l and ND to 16 mg/1 respectively. The concentrations of Na, K and CO_3 are almost negligible in concentration. The concentration of HCO_3 ranges from 18 to 214 mg/l. The concentration of chloride ranges from 2.8 to 21 mg/l.

However, the concentration of Fe ranges from 0.4 to 21 mg/l. The concentration of iron at majority of places is above desirable limit. The high-incidence of Fe renders groundwater unsuitable for drinking purposes. Arrangements should therefore, be made for removal or bringing down the Fe contents so that the waters may be used for drinking purpose without any risk of health hazards.

8.1 CHEMICAL QUALITY OF DEEPER GROUNDWATER USED FOR IRRIGATION

Ground water is being increasingly used for irrigation purposes by means of both shallow and deep tube wells. Ground water in the state is generally fresh and potable with low total dissolved solids as indicated by specific electrical conductivity (EC) values. The ground water occurring in the state may be classified as calcium bicarbonate type of water. All these chemical characteristics render the ground water suitable for irrigational uses.

Table 8.1 : General range of chemical constituents of ground water from shallow aquifers

	P^H	EC	Cl	CO_3	HCO_3	Ca	Mg	TH	TDS	Na	K	Fe
			In mg/litre									
Max.	8.9	954	212	90	310	38	23	195	406	55.78	41.86	2.76
Min.	6.1	33.79	7.09	0	5	4	1.19	25	51	1.39	1.46	0

Note : EC in mirco mhos/cm at 25^0C and other constituents are in mg/lt except pH

Table 8.2: General range of chemical constituents of ground water from deeper aquifers

	p^H	EC	Cl	$CaCO_3$	HCO_3	Ca	Mg	TH	TDS	Na	K	Fe
			In mg/litre									
Max.	8.9	418	41	170	188	32	11	115	130	21	3	21
Min.	6.5	50	2.8	5	31	1	Trace	5	10	1	1	0.2

Note : EC in mirco mhos/cm at 25^0C and other constituents are in mg/lt except pH

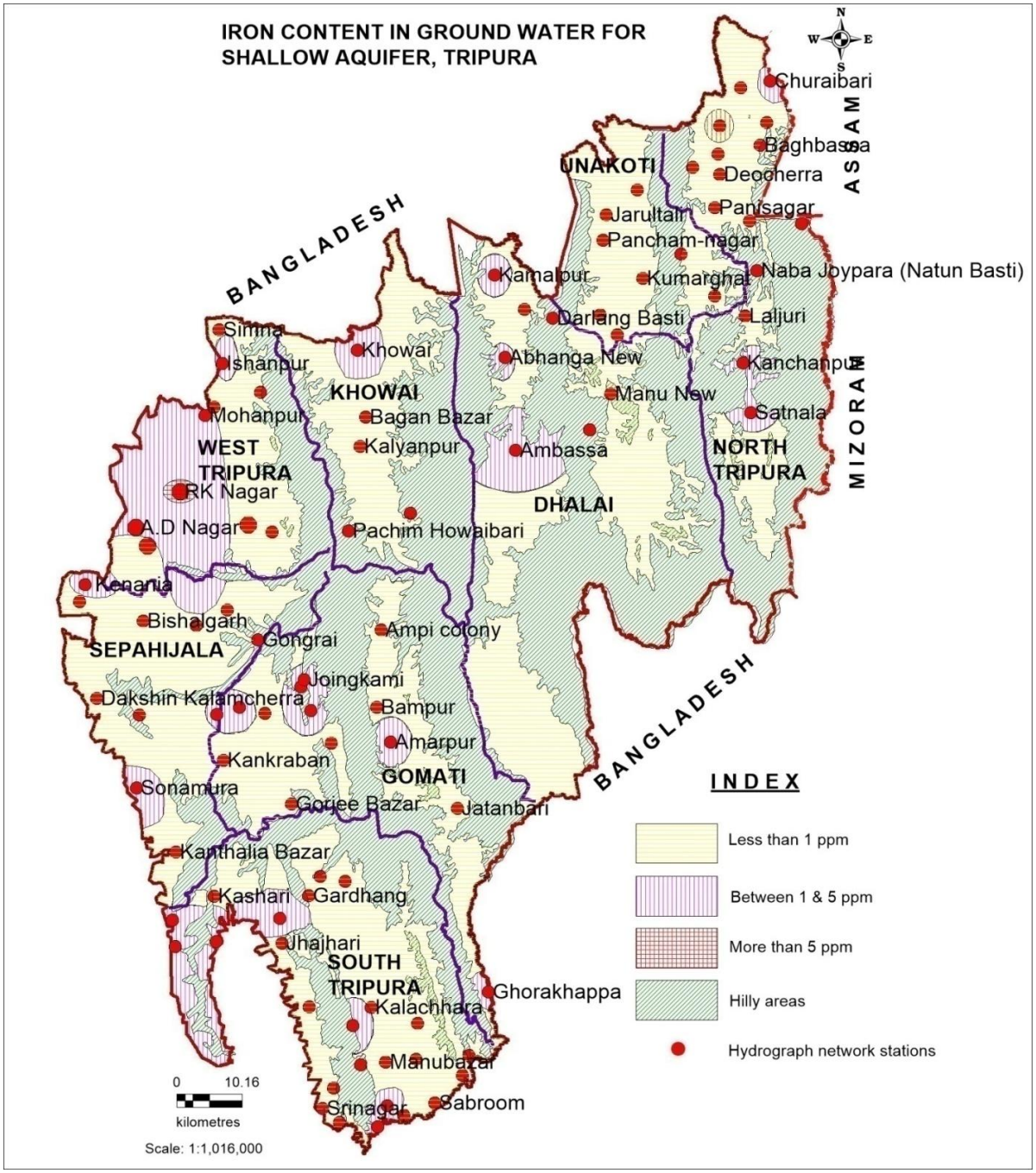


Fig 8.1: Map showing the areas and intensity of Iron contamination in shallow aquifers of Tripura

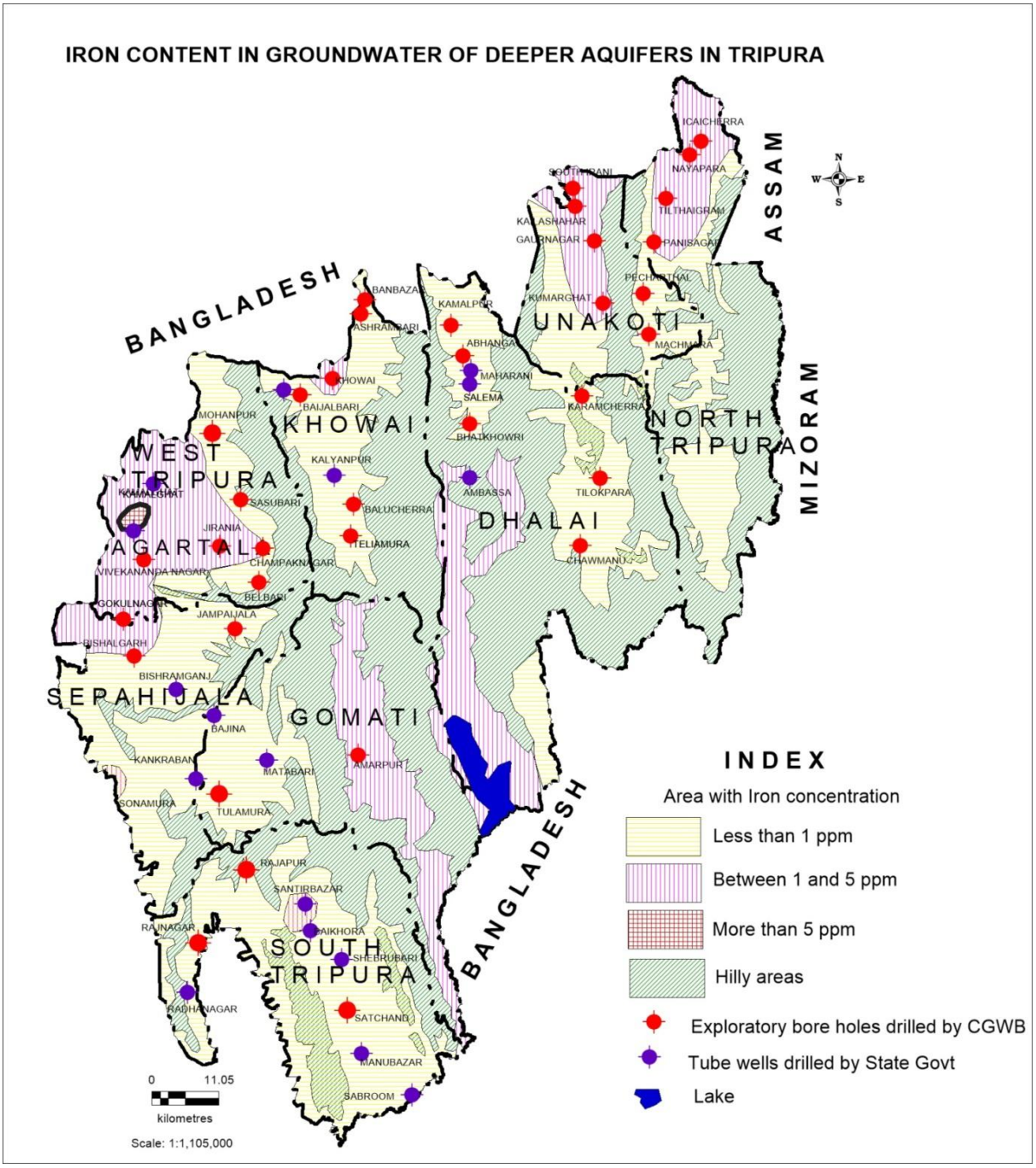


Fig 8.2: Map showing the areas and intensity of Iron contamination in deep aquifers of Tripura

9.0 CONCLUSIONS AND RECOMMENDATIONS

9.1 CONCLUSIONS

Tripura state is a small hilly state with geographical area of 10491.69 sq.km. Ground Water exploration was commenced in the state as early as 1976 and continued till 2018. Under Ground Water Exploration 102 numbers of Wells were drilled by CGWB at 76 locations. Out of the same, 65 EW, 26 OW, 2 SH and 9 Deposit well were constructed. In the state tube wells are constructed down to the maximum depth of 300 m. Except Longai basin, all other basins were explored to evaluate ground water potentiality. The density of wells worked out is, one exploratory well for every 140 sq.km. However, the density of wells is not uniform throughout the state. The results of exploration indicate that the deep tubewells constructed to the depth of around 250 m by tapping 40 - 60 m granular zone can yield about 30 to 100 m/hr for a drawdown up to 15m. Ground water exploration further reveals the presence of 4 to 6 potential aquifers in the state in addition to phreatic aquifer and existence of auto flow conditions in both shallow deeper aquifers. Auto flow conditions exist at many places with auto flow discharge of 15 lps at Khowai town. Ground water exploration has revealed the presence of high concentration of iron in ground water in most of the places. Other chemical constituents are very much within permissible limits for drinking and irrigation purposes.

9.2 RECOMMENDATIONS

i. Ground water in the state can be developed through deep tubewells, dugwells and artesian wells.
ii. Most of the auto flow discharge is joining into the streams/rivers and ultimately find its way into the neighbouring country. As this water is flowing 24 hours a day, it is recommended that suitable arrangement can be made to store this water and put to use in beneficial way for domestic, irrigation and fishery etc.
iii. The concentration of iron in most of the villages is beyond permissible limit and the concentration is as high as 21 ppm at Panisagar village. It has to be treated before put to use.
iv. There is large scope for further ground water development in the state. Large number of deep and shallow tubewells can be constructed in the state with space norms of 450 m for deep tube wells and 150 m for shallow tube wells.

LOCATIONS OF DEEP TUBE WELLS CONSTRUCTED BY CGWB IN TRIPURA

NORTH TRIPURA

1. **Panisagar (2005 well**)- Within BSF campus. Site is about 5oom from the main gate towards SSW. Opposite to DIG quarter.
2. **Panisagar (1977 well)** opposite to type IV Quarters
3. **Kanchanpur** – in the premises of Kanchanpur Court

UNAKOTI

1. **Kumarghat**- 2 km from Kumarghat to Kailashar Road.300m N 30 W of Tripura Industrial Estate Kumarghat . In paddy land belong to sri Jatindra Mohan Pal.
2. **Machmara**- NW side of Trijunction of Pecharthal-Kanchanpur-Kumarghat 15m away in paddy field of Sri Kantamani Chakma. 7km south of Pechartal
3. **Pechartal -**11 kms from Kumarghat.West of NH 44.In the play ground of high school.
4. **South Irani**- 11km from Kailasahar town and 3 km North from Babur bazaar from tinali of ailasahar-Hirachrra road. In the land of Sri Asaddar ali of Khowarabil.

DHALAI

1. **Kamalpur** - At Harerkola village, about 2km south of Kamalpur town and about 50 m east of 2km stone on the Ambassa - Kamalpur road
2. **Bhatkhowr**i - On Ambassa - Kamalpur road. 100m west of road near the village in the land of sri Satish ch. Das .About 200 m west of Bhatkhowri Junior Basic school
3. **Durai**- **Sib-bari** - (Halahali village) - on Ambassa Kamalpur road. In Halahali field, about 2km north of Halhali Market, in the land of Sri Mano mohan Pal
4. **Abhanga** - In the Fish Seeding office compound.
5. **Karamcherra -** Between Ambassa and Kumarghat. 125km from Agartala-50m NW of village market. In the land of Sri Tippam Raja.
6. **Tilokpara** - On Chhamanu-Manu Road. Site is located at about a km. SSE of Chalingta village. In the land of Sri Mohindar Kumar Debnath (Survey No - 80).
7. **Chawmanu** - 23 km from Manu. In Govt. land opposite to PWD quarters- forest range office and 60 m SW of health centre Chhaumanu.

KHOWAI

1. **Khowai**- East of TRTC Khowai bus stand which is about 60 m due south of the Tri-junction of Teliamura- Khowai road-Khowai office tilla road.
2. **Ashrambari -** North of Tehsil office about 30 m NE of the inspection Banglow.
3. **Baijalbari**- 20m west of Khowai-Subalsingh road and ½ km south 20 west of Baijalbari High school in the land of Sri Sivach Deb barma.

WEST TRIPURA DISTRICT

1. **Lichubagan**:- On Agartala airport road within the premises of Municipality Sector office. Greater Agartala, 50 m North of Sector office.
2. **Badarghat**- Off Agartala-Sabroom road. The site as within PHE sub- division-X office campus.

3. **Tripura University**-Suryamaninagar- On Agartala Udaipur Road within University campus, and in front of Boys hostel, 1 km from main gate.
4. **Bodhjungnagar**- On Kherpur-Neepco road, within the Premises of Industrial growth centre. 50 m east of administrative building.
5. **Nagichera**- SE of Agartala by pass road at a distance of 10 km and within the premises of Horticulture Research centre. Other 10 m west of staff quarter and 50m west of TSR office.
6. **Narsingarh**- On Airport road and within the premises of Polytechnic Institute.
7. **GPA Agartala**- Eastern side of road from the bifurcation from Lichubagan at about 4 km. In the air force land for GPA.
8. **Salbagan 96 BSF camp** (1979) - 13km NNE of Agartala. Site is 600 yards due north of Agartala - Mohanpur State Highway and due west of 96 BSF family lines quarters.
9. **Salbagan** - (New, 2004) Within TC & M frontier headquarter, 1.2 km from main entrance near hospital.
10. **Fatikchera**- within the BSF campus on Agartala-Mohanpur road, 25 km from Agartala. Site is about 750m from main gate towards SSE side between Jawans Barack and training ground.
11. **Belbari** – 30 km from Agartala. Approachable from Champaknagar lies in the field by Sri Debendra Deb Burma. 10 m east of Champaknagar -Jampuijala road.
12. **Jirania Coconut Farm**- 25 km from Agartala, 500 m SE of Jirania engineering college.
13. **P & T Colony**-(Arundhati nagar) - 7km south of Agartala in the west of Sabroom road

GOMATI

1. **Amarpu**r- 20m from the northern banks Amarpur tank, in the children's park, which is about 100 to 150m NW of the office of SDO (Civil).
2. **Ompinagar**- 40 m due NE of forest Dak Bunglow about ½ km S10 ^{0} w of Primary Health Centre.
3. **Rajapu**r- West of Birchandra manu on NH for about 2 kms. Site is located of 100 m away from village market and VLW godown. It lies south 60^{o} E of VLws office.
4. **Dhupthali** -North of Dhupthali Bazar 12 km gorjee on Garjee – Tulamura – Borpathari road.
5. **Tulamura** - In open land of Sri Rashamoy Pal. 15m west of the house of Sri Sudhir Ch. Ghosh. 30m south of Garji, Tulamura Mirza road.
6. **Dhuptali** - North of Duptali Bazar in Matabari block of Udaipur Sub Division.

SEPAHIJALA

1. **Gakulnagar 78 BSF Camp** -16km south of Agartala 3km North of Bishalgarh -100 m due east of Agartala Udaipur road and NE of 78 BSF Family welfare centre.
2. **Konaban**- On Agartala Udaipur road, 9.5km from Gokul Nagar, 200m west of kali temple of the Ramakrishna Ashram and 30m south of Konaban Gokulnagar Road : 51 cm Madhupur.
3. **Golaghati** - 9.5km from Bishalgarh 50m SE of panchayat office and 10m south of fish market.
4. **Gokulnagar BSF camp**- 22km from Agartala on Udaipur road. East of NH 1km from gate No-1.

SOUTH TRIPURA

1. **Rajnagar :** 11 m west of Rajnagar market and N 35 W of Rajnagar Block office.

2. **Satchand** - on SE of Udaipur- Subroom road in front of the Junior Basic School No. - II
3. **Haripur** - Near hospital of Hrishyamukh at the Junction of road leading to the Forest Rest House.
4. **Bagafa**- Within Bagafa BSF campus. 330m from main gate towards SSE on the end point of officers quarter. 81 kms from Agartala.

LITHOLOGICAL LOG OF EXPLORATORY WELLS CONSTRUCTED IN TRIPURA

District – North Tripura

PANISAGAR BSF CAMPUS (EW, 1977) (PANISAGAR BLOCK)

Lithology	Depth Range (mbgl)	Thickness (m)
Shale, brown, intercalation with sandstone	00.00 – 9.60	9.60
Sandstone, fine to medium, brown, with shale intercalation	9.60– 25.74	16.14
Shale, brown mixed with sandstone.	25.74 – 32.12	6.38
Sandstone, fine to medium grained, brown, with little shale	32.12 – 47.86	15.74
Shale, brownish mixed with sandstone	47.86 – 51.26	3.40
Sandstone, medium grained, brown	51.26 – 67.02	15.76
Shale, greyish mixed with sandstone	67.02 – 79.70	12.68
sandstone, fine to medium grained, greyish, mixed with shale	79.70 – 143.58	63.88
Sandstone, fine to medium grained, greyish	143.58 – 149.96	6.38
Sandstone, fine to medium grained, greyish mixed with shale	149.96 – 169.10	19.14
Shale, greyish hard	169.10 – 198.00	28.90

PANISAGAR BSF CAMP (EW, 2005) (PANISAGAR BLOCK)

Lithology	Depth Range (mbgl)	Thickness (m)
Surface Soil, Brownish, sandy.	00.00-6.80	6.80
Shale, Brownish, mixed with fine grained sandstone.	6.80-22.25	15.45
Shale, Brownish.	22.25-25.25	3.00
Sandstone, Fine grained, brownish, with little shale.	25.25-31.40	6.15
Sandstone, Fine to medium grained, brownish.	31.40-65.30	33.90
Sandstone, Brownish, fine to medium grained mixed with little shale.	65.30-68.30	3.00
Sandstone, Brownish, fine to medium grained mixed with gray shale.	68.30-80.60	12.30
Sandstone, Whitish, fine to medium grained.	80.60-99.05	18.45
Sandstome, Light brownish, fine gramned.	99.05-105.20	6.15
Sandstone, Whitish, fine to medium grained.	105.20-139.10	33.20
Sandstone, Whitish, fine to medium grained, mixed with gray shale.	139.10-142.10	3.00
Sandstone, Whitish, fine to medium grained.	142.10-148.25	6.15
Sandstone, Light brownish, fine grained.	148.25-151.40	3.15
Sandstone, Whitish, fine grained.	151.40-191.30	39.90
Shale, Gray	191.30-197.45	6.15

RATACHERRA (KADAMTALA BLOCK)

Lithology	Depth Range (mbgl)	Thickness (m)
Surface clay with fine grained sandstone, brownish	0 – 24.4	24.4
Sandstone, fine grained, greyish	24.4 – 61.0	36.6
Sandstone, fine to medium grained, brownish	61.0 – 67.1	6.1
Sandstone, medium grained, greyish	67.1 – 149.4	82.3
Sandstone, medium grained, greyish	149.4 – 155.4	6.0

Shale, greyish, mixed with sandstone, fine grained	155.4 – 182.9	27.5
Shale, grey	182.9 – 195.1	12.2

KANCHANPUR COURT (LALJURI BLOCK)

Lithology	Depth Range (mbgl)	Thickness
Topsoil, Yellowish in Colour	0-3	3
Shale mixed with Sand, Yellowish in Colour	3-12	9
Shale, Grey in Colour	12-27	15
Hard Shale, Grey in Colour	27-30	3
Shale, Grey in Colour	30-39	9
Plastic Shale, Sticky in Nature and Blakish Grey in Colour	39-51	12
Sand mixed With Shale, Greyish Yellow in Colour	51-57	6
Shale, Grey in Colour	57-63	6
Sand mixed With Shale, Greyish Yellow in Colour	63-66	3
Coarse sand Mixed With Shale, Greyish Yellow in Colour	66-72	6
Fine Sand Mixed With Shale, Greyish Yellow in Colour	72-75	3
Coarse sand With Shale, Greyish Yellow in Colour	75-87	12
Sand with Shale, Greyish Yellow in Colour	87-90	3

District – Unakoti

PECHARTHAL EW (BLOCK- PECHARTHAL)

Lithology	Depth range (mbgl)	Thickness (m)
Shale, yellowish brown	0.00-3.80	3.80
Shale, yellowish with silty sandstone	3.80-6.80	3.00
Sandstone, dirty white, friable fine grained consists of sub rounded grains of quartz, dirty minerals and iron nodules.	6.80-10.5	3.25
Sandstones, gray, fine to medium grey with little shale	10.5-13.5	3.00
Shale, grey to ash grey with silty sand stone	13.5-16.30	3.25
Sandstones, gray fine with grains of quartz micas etc.	16.30-25.55	9.25
Sandstone, grey fine grained with grey shale	25.55-28.80	3.25
Shale, grey with silt and fine grained and sandstone	28.80-41.30	12.50
Sandstone, grey fine grained	41.30-44.30	3.00
Silty sandstone, grey moderately compact	44.30-47.55	3.25
Shale, grey, brittle	47.55-85.05	37.50
Shale, grey, with fine grained sandstone	85.05-110.05	25.00
Sandstone, grey fine grained with little shale	110.05-113.05	3.00
Sandstone, grey fine grained	113.05-116.30	3.25
Shale, grey, with silty sandstone	116.30-144.30	28.00
Sandstone, grey fine to medium with wood fragments & coal	144.30-160.05	15.75
Shale, grey, with silty sandstone	160.05-172.55	12.50
Sandstone, grey with shale	172.55-175.55	3.00
Sandstone, grey fine to medium grained.	175.55-200.68	25.13
Shale, grey, with fine to medium grained sandstone	200.68-209.88	9.20
Sandstone, grey with little shale	209.88-212.88	3.00
Shale, grey, with fine to medium grained sandstone	212.88-215.98	3.10
Sandstone, grey fine to medium grained	215.98-246.48	30.50
Sandstone, grey fine to medium grained with shale	246.48-249.48	3.00
Sandstone, grey fine to medium grained	249.48-255.58	6.10

Sandstone, grey fine to medium grained with shale	255.58-264.78	9.20
Shale, grey, with fine to medium grained sandstone	264.78-276.98	12.20
Sandstone, grey fine to medium grained with shale	276.98-279.98	3.00
Shale, with fine to medium grained sandstone	279.98-286.08	6.10
Sandstone, grey fine to medium grained	286.08-292.93	6.85

MACHMARA EW (PECHARTHAL BLOCK)

Lithology	Depth Range (mbgl)	Thickness (m)
Shale, brownish	00.00-10.30	10.30
Sandstone, medium grained, brownish	10.30-25.70	15.40
Shale, grayish mixed with sandstone	25.70 –59.30	33.60
Sandstone, fine to medium grained, grayish	59.30 -68.40	18.10
Shale, grayish.	68.40 –86.70	18.30
Sandstone, fine grained, grayish mixed with shale	86.70 –89.80	3.10
Sandstone, fine grained, grayish	89.80 –95.90	6.10
Shale, grayish.	95.90 –102.00	6.10
Sandstone, fine grained, grayish mixed with shale	102.00 –105.00	3.00
Shale, grayish	105.00 –111.10	6.10
Sandstone, grayish, mixed with shale	111.10 -114.20	3.10
Sandstone, fine to medium grained grayish	114.20 –138.60	24.40
Sandstone, grayish mixed with shale	138.60 –141.60	3.00
Sandstone, fine to medium grained, grayish	141.60 –166.00	24.40
Sandstone, grayish mixed with shale	166.00 –172.10	6.10
Sandstone, fine to medium grained, grayish	172.10 –181.30	9.20
Sandstone, grayish, mixed with shale	181.30 –196.50	15.20
Shale, grayish	196.50 –205.70	9.20
Sandstone, fine to medium grained, grayish	205.70 –245.30	39.60
Shale, fine grained sandstone, grayish	245.30 –300.30	55.00

KUMARGHAT EW (KUMARGHAT BLOCK)

Lithology	Depth Range (mbgl)	Thickness (m)
Sandstone, fine grained, greyish,	00.00 – 12.50	12.50
Sandstone, medium grained, brownish	12.50 – 15.60	3.10
Sandstone,	15.60 – 110.00	94.40
Sandstone, fine grained, greyish mixed with shale	110.00 – 125.40	15.40
Shale, greyish	125.40 – 143.70	18.30
Sandstone, fine to medium grained, greyish mixed with shale	143.70 – 165.00	21.30
Sandstone, fine to medium grained, greyish	165.00 – 168.10	3.10
Sandstone, fine grained, greyish, mixed with shale	168.10 – 174.20	6.10
Shale, greyish	174.20 – 183.30	9.10
Sandstone, fine grained, greyish	183.30 – 189.40	6.10
sandstone, fine grained, greyish, mixed with shale	189.40 – 213.80	24.40
Shale, greyish sticky	213.80 – 235.00	21.20
Sandstone, fine to medium grained, greyish mixed with shale	235.00 – 250.40	15.40

KAILASHAHAR URBAN (GAURNAGAR BLOCK)

Lithology	Depth Range (mbgl)	Thickness (m)

Shale, grey mixed with sandstone fine grained	0 – 18.30	18.30
Shale, brownish	18.3 – 36.6	18.3
Sandstone, brownish mixed with shale	36.6 – 42.7	6.1
Shale, brownish	42.7 – 57.9	15.2
Sandstone, light grey, mixed with shale	57.9 – 67.1	9.2
Sandstone, fine to medium grained greyish	67.1 – 79.2	12.1
Sandstone, light grey, mixed with shale	79.2 – 88.4	9.2
Sandstone, fine to medium grained greyish	88.4 – 97.5	9.1
Sandstone, light grey, mixed with shale	97.5 – 109.7	12.2
Sandstone, fine to medium grained greyish	109.7 – 115.8	6.1
Shale, greyish	115.8 – 176.8	61.0
Sandstone, fine grained greyish	176.8 – 207.3	30.80
Sandstone, light grey, mixed with shale	207.3 – 225.6	18.3
Shale, greyish	225.6 – 231.6	6.0
Sandstone, light grey, mixed with shale	231.6 – 253.0	21.4
Shale, brownish	253.0 – 262.1	9.1

SOUTH IRANI EW (GAURNAGAR BLOCK)

Lithology	Depth Range (mbgl)	Thickness (m)
Sandstone, weathered, yellow fine rounded to sub rounded quartz with little shale	Gl-3.00	3.00
Shale, yellow, with thin intercalations of sandstone	3.00-6.80	3.80
Sandstone, yellow, fine to medium with intercalation of shale	6.80-12.90	6.10
Shale, yellow, with thin intercalations of sandstone	12.90-15.90	3.00
Sandstone, yellow, fine with thin intercalated shale	15.90-22.00	6.10
Sandstone, yellow to reddish grey with sandstone, intercalations	22.00-34.20	12.20
Sandstone, yellow to reddish yellow fine	34.20-40.30	6.10
Shale , grey to greenish grey	40.30-43.40	3.10
Sandstone, yellow to reddish yellow fine	43.40-49.50	6.10
Shale, grey to yellowish and reddish grey with thin sandstone intercalations	49.50-73.90	24.40
Sandstone, grey, fine	73.90-77.00	3.10
Shale, grey to greenish grey with thin sandstone intercalations	77.00-141.00	64.00
Sandstone, yellow, fine	141.00-144.00	3.00
Shale, grey to yellowish grey with intercalations of sandstone	144.00-195.00	51.90
Sandstone with shale	195.00-217.20	21.30
Shale with sandstone	217.20-235.50	18.30
Sandstone with thin shale intercalations shale	235.50-247.70	12.20
Shale	247.70-253.80	6.10
Sandstone with shale	253.80-256.90	3.10
Shale, grey	256.90-259.90	3.00
Sandstone, grey, fine	259.90-263.00	3.10
Shale	263.00-278.20	15.20
Sandstone, grey, fine with thin intercalations of shale.	278.20-287.40	9.20
Shale with thin intercalations of sandstone	287.40-290.40	3.00
Sandstone, grey, fine with shale	290.40-296.50	3.80
Shale, grey, with thin intercalation of sandstone	296.50-300.30	3.80

KARAICHERRA (PECHARTHAL BLOCK)

Lithology	Depth Range (mbgl)	Thickness
Topsoil, Yellowish in Colour	0-3	3
Shale mixed with Sand, Yellowish in Colour	3-18	15
Shale, Grey in Colour	18-60	42
Hard Shale, Grey in Colour	60-90	30
Very Hard Shale, Grey in Colour	90-116.60	26.6

District – Dhalai

CHAWMANU (EW) (CHAWMANU BLOCK)

Lithology	Depth Range (mbgl)	Thickness (m)
Shale, brownish	0.00 -4.57	4.57
Sandstone, fine grained, brownish	4.57 –7.52	3.05
Shale, greyish	7.62 –118.87	111.25
Sand stone, fine to medium grained, greyish	118.87 –158.49	39.62
Shale, greyish mixed with sandstone	158.49 –170.07	11.58
Sand stone, fine to medium grained greyish, mixed with shale	170.07 –173.73	3.66
Shale, greyish	173.73 –181.35	7.62
Sand stone, fine to medium grained, greyish mixed with shale	181.35 –185.93	4.58
Sand stone, fine to medium grained greyish	185.93 –192.80	6.87
Shale, greyish	192.80 –211.22	18.42
Sand stone, fine to medium grained, greyish	211.22 –256.03	44.81
Shale, greyish mixed with fine grained sandstone	256.03 –268.22	12.19
Sandstone, fine to medium grained, greyish	268.22 –274.32	6.10
Shale, greyish mixed with fine grained sandstone	274.32 –300.80	26.48

BHATKHOWRI (EW) (SALEMA BLOCK)

Lithology	Depth Range (mbgl)	Thickness (m)
Sandy soil, yellowish brown coloured with fine brown sand.	0.00-5.35	5.45
Clay, greyish brown clay with fine grains of sub-rounded sand	5.45-7.70	2.25
Sand, yellowish brown, fine, sub rounded micaceous sand.	7.70-10.70	3.00
Sandy gravel, brown fine coarse grained sand with rounded gravels of ferruginous sandstones and balls of grey clay	10.70-16.72	6.02
Sand light brown to dark brown brownish and brownish grey fine to medium sub-rounded, micaceous and with mafic minerals.	16.72-46.54	29.82
Gravely sand, Brown to yellowish brown compact with fine to coarse grained quartz (2 to 5mm) with weathered pieces of feldsper and ferruginous materials	46.54-58.45	11.91
Sand light gray to grey, fine to medium grained sub-rounded sand, micaceous with very little clay	58.45-67.48	9.03
Sand clayey, grey coloured fine to medium grained sub-rounded, micaceous sand with grey clay	67.48-94.53	27.05
Clay, greyish brown clay, loose with little admixture of fine grey sand	94.53-97.59	3.06
Sand, Grey coloured, mostly medium grained rounded, micaceous sand with mafic minerals	97.59-118.53	20.94
Sand, grey coloured fine to medium grained sand sub-rounded with little gray clay sticky and pieces of shale	118.53-136.56	18.03
Sand, grey, fine to medium micaceous sub rounded sand with mafic minerals	136.56-178.87	42.31
Sand, fine to medium grained grey coloured micaceous, subrounded sand with little sticky grey clay	178.87-209.03	30.16
Sand. Grey, fine to medium, sub-rounded, micaceous sand, occasionally coarse grained	209.03-227.16	18.16
Sand, grey mostly fine grained sub-rounded, micaceous sand with mafic minerals.	227.16-272.12	44.96
Sand clayey, grey fine grained with grey clay.	272.12-284.07	11.95
Sand grey fine to very fine sub-rounded, micaceous sand (maffic)	284.07-305.24	21.17

ABHANGA (EW) (SALEMA BLOCK)

Lithology	Depth Range (mbgl)	Thickness (m)
Surface soil, brown with fine grains of sand	00.00 – 4.00	4.00
Sandstone, fine to medium grained, brownish	4.00 – 14.48	10.48
Sandstone, fine to medium grained, greyish mixed with shale	14.48 – 20.50	6.02
Shale, greyish	20.50 – 27.43	6.93
Shale, greyish mixed with fine to medium grained sandstone	27.43 – 32.00	4.57
Shale, greyish	32.00 – 44.64	12.64
Shale, greyish mixed with fine to medium grained sandstone	44.64 – 53.62	9.98
Sandstone, fine grained, greyish, mixed with shale	53.62 – 59.67	6.05
Shale, greyish mixed with fine grained sandstone	59.67 – 63.00	3.33
Sandstone, fine to medium grained, brownish	63.00 – 68.58	5.58
Shale, greyish mixed with sandstone	68.58 – 157.32	88.74
Sandstone, fine to medium grained, greyish mixed with shale	157.32 – 180.42	23.10
Sandstone, fine to medium grained, greyish	180.42 – 195.40	14.98
Sandstone, fine to medium grained, greyish mixed with shale	195.40 – 201.30	5.90
Sandstone, fine to medium grained, greyish	201.30 – 204.20	2.90
Sandstone, fine to medium grained, greyish mixed with shale	204.20 – 205.72	1.52
Sandstone, fine to medium grained, greyish	205.72 – 219.33	13.61
Sandstone, fine to medium grained, greyish mixed with shale	219.33 – 222.33	3.00
Sandstone, fine to medium grained, greyish	222.33 – 231.27	8.94
Sandstone, fine to medium grained, greyish mixed with shale	231.27 – 240.27	9.00

TILAKPARA (EW) (CHHAMANU BLOCK)

Lithology	Depth Range (mbgl)	Thickness (m)
Topsoil, sandy clay brownish yellow grey, loose, plastic with a few hard brittle pieces.	0.00-13.00	13.00
Sandstone, friable, gray fine grained with angular to sub angular quartz & fine intercalation of shale	13.00-36.00	23.00
Shale, grey, brittle with mottle clay, fine sandstone intercalation	36.00-47.00	11.00
Sandstone, grey, fine to medium with shale intercalation	47.00-61.00	14.00
Shale, grey, hard brittle with fine sandstone intercalation	61.00-70.00	9.00
Sandstone, grey, fine to medium grained with shale	70.00-76.00	6.00
Shale, grey, hard brittle with fine sandstone	76.00-89.00	13.00
Sandstone, grey, fine to medium grained with shale	89.00-114.00	25.00
Shale, grey, hard brittle with fine sandstone intercalation	114.00-117.00	3.00
Sandstone, grey, fine to medium grained with shale	117.00-140.00	23.00
Shale, grey, hard brittle with sandstone	140.00-155.00	15.00
Sandstone, grey, fine to medium grained with shale	155.00-159.00	4.00
Shale, grey, hard brittle with sandstone	159.00-175.00	16.00
Sandstone, grey, fine to medium grained with shale	175.00-181.00	6.00
Shale, grey, hard brittle with sandstone	181.00-190.00	9.00
Sandstone, grey, fine grained with shale	190.00-195.00	5.00
Shale, grey, hard brittle with sandstone	195.00-199.00	4.00
Sandstone, grey, fine to medium grained with shale	199.00-205.00	6.00
Shale, grey, hard brittle with sandstone	205.00-208.00	3.00
Sandstone, grey, fine to medium grained with shale	208.00-220.00	12.00
Shale, grey, hard brittle with sandstone	220.00-231.00	11.00
Sandstone, grey, fine to medium grained with shale	231.00-237.00	6.00
Shale, grey, hard brittle with sandstone	237.00-246.00	9.00
Sandstone, grey, fine to medium grained with shale	246.00-300.00	54.00

TILAKPARA (OW) (CHHAMANU BLOCK)

Lithology	Depth Range (mbgl)	Thickness (m)
Clay sandy brownish yellow and grey, loose, plastic with a few hard brittle pieces of petrified wood shale and sandstone.	0.00-13.80	13.80
Sandstone, friable, gray fine grained with angular to sub angular translucent quartz with shale	13.80-35.20	21.40
Shale, grey, hard brittle with sandstone.	35.20-56.50	21.30
Sandstone, grey, fine to medium grained with shale	56.50-74.80	18.30
Shale, grey, hard brittle with sandstone	74.80-90.10	15.30
Sandstone, grey, fine to medium grained with shale	90.1-114.50	24.40
Shale, grey, brittle with sandstone	114.50-117.50	3.00
Sandstone, grey, fine to medium grained with shale	117.50-138.90	21.40
Shale, grey, hard brittle with fine sandstone	138.90-172.40	33.50
Sandstone, grey, fine to medium grained with shale	172.40-181.60	9.20
Shale, grey, hard brittle with sandstone	181.60-196.80	15.20
Sandstone, grey, fine to medium grained with shale	196.80-206.00	9.20
Shale, grey, hard brittle with sandstone	206.00-212.10	6.10
Sandstone, grey, fine to medium grained with shale	212.10-218.20	6.10
Shale, grey, hard brittle with fine sandstone	218.20-221.20	3.00

KARAMCHERRA EW (MANU BLOCK)

Lithology	Depth Range (mbgl)	Thickness (m)
Sandstone, brown friable fine grained, angular sub translucent mainly composed of quartz with admixture of clay	0.00 – 4.00	4.00
Shale, brownish greyish hard plastic	4.00 – 14.00	10.00
Silty sandstone, greyish brown fine with angular to sub angular quartz fragments	14.00 – 21.00	7.00
Sandstone, grey fine to medium with intercalations of shale and micaceous minerals (muscovite).	21.00 – 30.00	9.00
Sandstone, grey fine grained with little intercalations of shale	30.00 – 61.00	31.00
Sandstone grey medium grained with shale and muscovite mica	61.00 – 74.00	13.00
Sandstone grey fine grained with shale	74.00 – 93.00	19.00
Shale, gray brittle with fine grained sandstone intercalations and mottle clay	93.00 – 96.00	3.00
Sandstone, grey fine grained, with little shale	96.00 – 110.00	14.00
Shale, gray brittle	11.00 – 111.00	1.00
Sandstone, grey fine to medium grained,	111.00 – 120.00	9.00
Shale, gray brittle	120.00 – 121.00	1.00
sandstone, grey fine to medium with little shale	121.00 – 136.00	15.00
Shale, gray with intercalations of fine grained sandstone	136.00 – 146.00	10.00
Sandstone, grey fine to medium grained, with little shale	146.00 – 157.00	11.00
Shale, gray mixed with intercalated sandstone	157.00 – 167.00	10.00
Sandstone, grey fine to medium grained, with muscovite mica and intercalations of shale	167.00 – 177.00	10.00
Shale, gray with intercalations of sandstone	177.00 – 193.00	14.00
Sandstone, grey fine to medium grained, with shale	193.00 – 204.00	11.00
Shale, gray brittle	204.00 – 207.00	3.00
Sandstone, grey, fine to medium grained,	207.00 – 225.00	18.00
Shale, gray brittle	225.00 – 227.00	2.00
Sandstone, grey fine to medium grained, with little intercalations of	227.00 – 247.00	20.00

shale		
Shale, gray brittle with fine grained sandstone	247.00 – 294.00	47.00

HARINCHERRA (AMBASSA BLOCK)

Lithology	Depth Range (mbgl)	Thickness (m)
Surface soil, brownish	00.00 – 6.00	6.00
Shale, greyish	6.00 – 10.00	4.00
Sandstone, fine grained, greyish mixed with shale	10.200 – 20.00	10.00
Shale, greyish	20.00 – 23.00	3.00
Sandstone, fine grained, greyish mixed with shale	23.00 – 53.00	30.00
Shale, greyish	53.00 – 66.00	13.00
Sandstone, fine grained, greyish mixed with shale	66.00 – 80.00	14.00
Sandstone, fine to medium grained, greyish	80.00 – 120.00	40.00
Sandstone, fine grained, greyish mixed with shale	120.00 – 150.00	30.00
Shale, greyish mixed with sandstone fine grained	150.00 – 160.00	10.00
Sandstone, fine grained, greyish, mixed with shale	160.00 – 164.00	4.00
Shale, greyish	164.00 – 203.00	39.00

KULAI EW (AMBASSA BLOCK)

Formation	Depth Range (mbgl)	Thickness
Topsoil, Brown in Colour	0-6	6
Sand, Medium Grained Sand mixed with Clay, Brown in Colour	Jun-18	12
Sand, Medium Grained Sand Mixed With Clay and Biotite, Brownish Grey in Colour	18-75	57
Sandy Clay, Medium to Coarse Grained Sandy Clay Mixed With Quartz	75-90	15
Sandy Clay, Medium grained Sandy Clay(Clay is of around 60%), Brown in Colour	90-96	6
Sand, Coarse Grained Sand Mixed With Clay, Brown in Colour	96-108	12
Sand, Coarse sand mixed with Quartz Grain, Brown in Colour	108-120	12
Sand, Medium Grained Sand, Brown in Colour	120-129	9
Sandstone, Medium Grained Sandstone Mixed With Shale, Brownish Grey in Colour	129-135	6
Sandstone, Fine to Medium Grained sand mixed with Shale, Brownish Grey in Colour	135-150	15

DURAI SIB BARI (HALAHALI) (DURGACHOWMUHANI BLOCK)

Formation	Depth Range (mbgl)	Thickness
Clay, Gray hard sticky	0.00-6.09	6..09
Sand, Gray fine to medium grained subrounded with mafic minerals.	6.09-10.05	3.96
Sand Clayey, Light brown fine to medium grained with subrounded sandstone.	10.05-16.76	6.71
Sand, Light brown fine to medium grained subrounded.	16.76-24.38	7.62
Sand clayey, Light brown fine to medium grained subrounded with gray clay.	24.38-28.34	3.96
Sand, Light brown fine to medium grained subrounded feldspathic sand.	28.34-31.92	3.58
Sand clayey, Light greenish brown fine grained occasionally coarse grained subrounded with clay and ferruginous sandstone.	31.92-36.57	4.65
Sand, Light brown fine grained subrounded occasionally coarse	36.57-39.00	2.43

grained with ferruginous sandstone.		
Sand clayey, Light brown fine to medium grained subrounded	39.00-40.54	1.54
Sand, Brownish gray fine to medium grained subrounded with very little clay.	40.54-43.59	3.05
Sand clayey, Light grayish brown fine to very fine sand subrounded occasionally coarse grained with mottle clay.	43.59-57.00	13.41
Sand, Light greenish brown fine grained subrounded with small nodules of ferruginous sandstone.	57.00-66.45	9.45
Sand clayey, Light brown fine grained sand with grayish brown clay.	66.45-95.68	29.43
Sandy clay, Gray with admixture of fine to medium grained with ferruginous sandstone.	95.68-118.87	23.19
Sand, Grayish brown subrounded fine to medium grained.	118.87-123.07	4.2
Sandy clay, Gray with fine grained sand.	123.07-130.45	7.38
Sand, Gray fine grained with little clay.	130.45-135.63	5.18
Sandy clay, Gray clay with fine to medium grained gray sand.	135.63-143.25	7.62
Sand, Gray fine grained sub rounded.	143.25-147.82	4.57
Sandy clay, Gray, loose clay with fine gray sand.	147.82-151.48	3.66
Sand, Brownish gray fine grained.	151.48-154.82	2.74
Clay, Sticky.	154.82-156.96	2.74
Sand, Light gray fine grained subrounded.	156.96-162.45	5.49
Sandy clay, Gray to brown sticky clay with admixture of sand.	162.45-185.93	23.48
Clay, Gray clay with very little sand.	185.93-191.57	5.64
Sandy clay, Light yellowish brown and sticky clay fine grained sand.	191.57-197.49	9.92
Clay, Brownish gray and sticky clay.	197.49-215.49	18
Sandy clay; Gray fine to medium grained subrounded with clay.	215.49-224.52	9.03
Sand; Gray fine to medium grained micaceous.	224.52-251.55	27.03

District – Khowai

BAIJALBARI EW (KHOWAI BLOCK)

Lithology	Depth Range (mbgl)	Thickness (m)
Clay brown sticky clay with little sand (20%)	0.00-6.60	6.60
Sand, fine to medium grained light brown, micaceous	6.60-12.70	6.10
Clay sandy, brownish sticky withy fine to medium grained sand	12.70-15.80	3.10
Clay, greyish mixed with fine sand	15.80-40.20	24.40
Clay sandy, greyish with fine to medium sand increase downward	40.20-55.40	15.20
Clay, grey, little sand 10-20%, few weathered fine sandstone	55.40-76.80	21.40
Sand, grey , angular, micaceous medium with mafics and clay	76.80-79.80	3.00
Clay sandy, grey with fine grained sand	79.80-85.90	6.10
Sand grey fine to medium with little grey clay,	85.90-101.20	15.30
Clay sandy, grey with fine medium grained sand	101.20-110.30	9.10
Sand, grey, fine to medium occasionally coarse with mafics clay content about 120% sticky soft, few pieces of quartz & feldsper	110.30-134.80	24.50
Clay, grey, sticky, hard	134.80-168.30	33.50
Sand, grey fine grained micaceous, with little clay	168.30-180.50	12.20
Clay grey , hard with fine grained sand	180.50-186.60	6.10
Sand, grey micaceous, fine to medium sand with little clay	186.60-192.70	6.10
Clay grey , hard with fine grained sand	192.70-195.80	3.10
Sand, grey fine grained micaceous with pieces of hard shale.	195.80-204.90	9.10
Sand fine grained grey micaceous sand with little clay,	204.90-208.00	3.10
Clay grey hard with little sand	208.00-211.00	3.00
Sand grey, mostly fine with sticky and ihard pieces of clay	211.00-223.20	12.20
Sandy clay, grey hard with fine grained sand	223.20-226.30	3.10
Sand, grey, very fine grained, micaceous with clay 30% sand	226.30-229.30	3.00
Clay, grey, hard, sticky with little sand (20%) sticky.	229.30-256.70	27.40

ASHRAMBARI EW (KHOWAI BLOCK)

Lithology	Depth Range (mbgl)	Thickness (m)
Top soil, sandy loam, light brown, fine to medium grained with little admixture of clay and laterites.	00-5.24	5.24
Sandy clay, yellowish brown clay with fine to medium sand.	5.24-10.43	5.19
Sand clayey, yellowish brown, fine to medium grained sand with little admixture of brown clay and pieces.	10.43-13.43	3.00
Clay sandy, greyish brown sand fine grained.	13.43-16.45	3.02
Sand, pink mostly fine grained.	16.45-28.50	12.05
Sand, grey fine to medium grained with micaceous minerals	28.50-34.55	6.05
Sand, brownish yellow, fine to medium grained sub-rounded.	34.55-49.57	15.02
Sand, greyish white, fine to medium with grey clay and mafics	49.57-52.62	3.02
Gravelly sand, light brown fine to coarse sand with gravel (1mm-3mm) with sub angular quartz gravel and well rounded brown ferruginous sandstone gravel and few pieces of feldspar.	52.62-55.362	3.00
Sand, light yellow, fine to medium grained sub-rounded.	55.62-64.70	9.08
Sand, light brown, fine to medium grained sub-rounded.	64.70-67.70	3.00

Sand clayey dark grey light yellow fine to medium sand with little clay and coarse pieces of ferruginous minerals.	67.70-73.74	6.04
Sand, light greyish yellow, fine to medium grained sub-rounded along with fragments of shale and decayed wood.	73.24-79.39	5.95
Clay, mottled, plastic and sticky mixed with fine grained sand.	79.69-82.77	3.08
Sand, grey fine to medium grained with a little brownish clay.	82.77-85.77	3.00
Clay sandy, mottle grey, plastic and sticky with admixture of fine-grained sand and broken pieces of ferruginous sandstone.	85.77-106.65	18.88
Sand, brownish grey, medium with feldspar, quartz and mafic	106.65-112.67	6.02
Sand clayey, grey and yellowish brown medium sand with clay.	112.67-118.69	6.02
Sand brown medium sub-rounded with weathered feldspar, quartz, mafic minerals and pieces of ferruginous sandstone.	118.69-124.73	6.04
Sand, grey, medium grained with occasional coarse sand, sub-rounded with pieces of shale3 and ferruginous sandstone.	124.73-148.73	8.99
Sand clayey, grey fine to medium with admixture of grey clay.	148.73-151.73	3.00
Sand, grey and light yellowish brown, fine to medium sub-rounded mixed with shale pieces, sandstone and little clay.	151.73-169.74	18.01
Sand, greyish black fine to medium grained, sub-rounded with pieces of sandstone, decayed wood, peat and clay.	169.74-196.88	27.14
Clay sandy, greyish and violet colour clay, silty with rounded pieces of weathered ferruginous sandstone and little sand.	196.88-199.88	3.00
Clay, dark grey, sticky with broken pieces of sandstone and quartz with occasional red colour clay.	199.88-202.86	2.96
Sand clayey, grey, greyish black and brownish yellow fine to medium, with pieces of grey micaceous shale, ferruginous sandstone, quartz, decomposed feldspar, sandstones.	202.86-232.85	29.99
Sand, brownish yellow, mostly medium along with coarse pieces of quartz, weathered ferruginous sandstone, decomposed feldspar and biotite grains and a little variegated clay.	232.85-232.76	5.91
Clay sandy, greyish brown and grey fine to medium sand with ferruginous sandstone, weathered feldspar, quartz clay plastic.	238.76-250.72	11.96
Sand, light brown to grey, fine grained, sub-rounded, micaceous with pieces of quartz (anguar grains) and little grey clay.	250.72-262.78	12.06
Sand clayey, grey fine grained, micaceous with pieces of ferruginous sandstone and grey clay and weathered feldspar.	262.78-268.78	6.00
Sand, light grey to grey, fine micaceous along with silt, ferruginous substances and decomposed feldspar and quartz	268.78-301.68	32.90

ASHRAMBARI OW (KHOWAI BLOCK)

Lithology	Depth Range (mbgl)	Thickness (m)
Sand, brown, fine grained.	G.L- 4.00	4.00
Sand, brown, fine to medium grained with pieces of quartz, mica and mafic minerals.	4.00-16.95	12.95
Sand, White, fine to medium grained.	16.95-26.95	9.10
Clay, sandy brown sticky along with fine to medium sand.	26.95-35.25	9.20
Sand, brown fine grained with little clay.	35.25-38.025	3.00
Sand, brown to greyish brown, medium grained.	38.25-45.35	6.10
Sand, brown, fine grained.	44.35-47.45	3.10
Clay, sandy brown plastic along with fine to medium sand.	47.45-59.65	12.20
Clay, greyish brown plastic	59.65-105.35	45.70
Sand, greyish brown fine grained with little clay	105.35-108.45	3.10

Clay, brown plastic	108.45-114.55	6.10
Clay sandy, brown plastic along with fine to medium sand.	108.45-114.55	12.20
Sand, mottled (brownish) fine grained with little clay.	126.75-135.85	9.10
Clay, grey and sticky	135.85-151.15	15.30
Sand, grey fine to medium grained with little clay.	151.15-154.15	3.00
Clay, grey sticky with little admixture of fine-grained sand.	154.15-178.55	24.40

KHOWAI EW (KHOWAI BLOCK)

Lithology	Depth range (mbgl)	Thickness (m)
Shale, mixed with sandstone, brownish.	0.00 –3.60	3.60
Shale, mixed with sandstone, greyish.	3.60 – 16.36	12.76
Shale, mixed with sandstone, fine to medium, grained greyish	16.36 – 19.36	3.00
Shale, greyish, mixed with sandstone, fine to medium grained.	19.36 – 22.74	3.38
Shale, gray, mixed with sandstone.	22.74 – 32.12	9.38
Shale, mixed with sand tone, greyish.	32.12 – 35.50	3.38
Shale, brownish, mixed with sand tone, fine to medium grained.	35.50 – 61.02	25.48
Shale, greyish, mixed wth sandstone, medium grained, brownish	61.02 –67.40	6.38
Shale, greyish, mixed with sandstone, fine to medium grained.	67.40 –99.30	31.90
Shale, mixed with sandstone, gray.	99.30 -112.06	12.76
Shale, greyish, mixed with sandstone, fine to medium grained.	112.06-131.20.	19.14
Sandstone, fine to medium grained, light gray	131.20 –140.58	9.38
Shale, mixed with sandstone, greyish	140.58 –153.34	12.76
Sandstone, medium to coarse grained, light gray	153.34 –191.62	38.28
Sandstone, mixed with shale, grey	191.62 –294.92	103.30

BALUCHERRA EW (TELIAMURA BLOCK)

Lithology	Depth Range (mbgl)	Thickness (m)
Shale, brownish	0.00 –6.35	6.35
Sandstone, medium to coarse grained, brownish, with shale.	6.35 –19.15	12.80
Sandstone, medium to coarse grained, brownish	19.15 –28.41	9.26
Shale, greyish, mixed with sandstone	28.41 –31.41	3.00
Sandstone, fine to coarse grained, greyish,	31.41 –36.54	5.13
Shale, greyish, mixed with sandstone fine grained.	36.54 –42.62	6.08
Sandstone, fine to medium grained greyish	42.62 –52.50	9.88
Shale, greyish, mixed with sandstone	52.50 –55.50	3.00
Sandstone, fine to medium grained, greyish	55.50 –79.43	23.93
Sandstone, fine to medium grained, greyish mixed with shale	79.43 –88.54	9.11
Sandstone, medium grained, greyish	88.54 –142.84	54.30
Sandstone, greyish, mixed with shale	142.84 –151.86	9.02
Shale, mixed with sandstone, greyish	151.86 –157.78	5.92
Sandstone, medium grained, greyish	157.78 –160.68	2.90
Sandstone, mixed with shale, greyish	160.68 –166.69	6.01
Shale, greyish, mixed with sandstone	166.69 –181.61	14.92
Sandstone, fine grained, greyish	181.61 –202.74	21.13
Sandstone, medium grained greyish	202.74 –217.72	14.98
Shale, greyish, mixed with sandstone, medium grained	217.72 -226.76	9.04

Sandstone, medium grained, greyish, mixed with shale	226.76 –229.76	3.00
Sandstone, medium grained greyish	229.76 –262.88	33.12

CHAKMAGHAT EW (BLOCK- TELIAMURA)

Lithology	Depth Range (mbgl)	Thickness
Topsoil	0-6	6
Shale mixed with Fine grained Sand, Grey in Colour	06-12	6
Medium Grained sandstone mixed with Shale, Grey in Colour	12-15	3
Shale Mixed With fine grained Sand, Grey in Colour	15-24	9
Shale Mixed With fine grained Sand, Brownish Grey in Colour	24-30	6
Medium Grained Sandstone Mixed With Shale, Brownish Grey in Colour	30-57	27
Coarse Grained Sandstone Mixed with Clay, Grey in Colour	57-72	15
Shale mixed with fine grained Sand, Brownish Grey in Colour	72-87	15
Medium Grained Sandstone Mixed With Shale, Grey in Colour	87-102	15
Shale mixed with fine grained Sand, Grey in Colour	102-108	6
Fine Sand Mixed With Shale , Grey in Colour	108-128	20

CHAKMAGHAT OW (BLOCK- TELIAMURA)

Lithology	Depth range (m bgl)	Thickness
Topsoil, Grey in Colour	0-6	6
Shale mixed with Fine grained Sand, Grey in Colour	6-12	6
Medium Grained sandstone mixed with Shale	12-15	3
Shale Mixed With fine grained Sand, Grey in Colour	15-24	9
Shale Mixed With fine grained Sand, Brownish Grey in Colour	24-30	6
Medium Grained Sandstone Mixed With Shale, Brownish Grey in Colour	30-57	27
Coarse Grained Sandstone Mixed with Clay, Grey in Colour	57-72	15
Shale mixed with fine grained Sand, Brownish Grey in Colour	72-87	15
Medium Grained Sandstone Mixed With Shale, Grey in Colour	87-102	15
Shale mixed with fine grained Sand, Grey in Colour	102-108	6
Fine Sand Mixed With Shale , Grey in Colour	108-128	20

TOTABARI EW (BLOCK- KALYANPUR)

Lithology	Depth Range (mbgl)	Thickness
Topsoil, Brown in Colour	0-6	6
Fine Sand Mixed with little shale, Redish Brown in Colour	Jun-36	30
Fine Sand Mixed With shale, Redish Brown in Colour	36-48	12
Coarse sand mixed with shale, Redish Brown in Colour	48-60	12
Fine Sand Mixed With shale, Grey in Colour	60-72	12
Fine Sand Mixed With shale, Grey in Colour	72-81	9
Medium grained sand mixed with shale, Grey in Colour	81-90	9
Fine Sand Mixed With Clay, Grey in Colour	90-96	6
Medium Grained Sandstone Mixed With Shale, Grey in Colour	96-142	46
Fine sand mixed with Shale, Grey in Colour	142-150	8

District – West Tripura

TRIPURA UNIVERSITY CAMPUS, SURYAMANINAGAR (DUKLI BLOCK) – PZ (EW)

Lithology	Depth Range (mbgl)	Thickness (m)
Surface soil, brown, sandy	00.00 – 9.95	9.95
Sandstone, fine grained, brown, with lateritic particles	9.95 – 16.10	6.15
Sandstone, medium, brownish, with laterites, quartz & feldspar	16.10 – 22.25	6.15
Sandstone, coarse grained, brown, with lateritic material and angular to sub-angular grains of quartz and feldspar.	22.25 – 34.55	12.30
Sandstone, medium to coarse, brownish, laterite, quartz, feldspar	34.55 – 58.00	23.45
Sandstone, fine to medium grained, whitish, with quartz, feldspar and ironaceous material.	58.00 – 62.15	4.15
Sandstone, fine to medium grained, whitish	62.15 – 89.90	27.75
Sandstone, fine grained with shale grey	89.90 – 94.00	4.10
Sandstone, fine to medium, creamish with quartz, feldspar, mica	94.00 – 103.00	9.00
Sandstone, very fine grained.	103.00 – 106.00	3.00
Sandstone, fine to medium with quartz, feldspar and little mica	106.00 – 135.00	29.00
Sandstone, fine grained with shale, grey	135.00 – 143.00	8.00
Sandstone, fine to medium, particles of quartz, feldspar & mica	143.00 – 180.00	37.00
Sandstone fine grained creamish in colour with shale, grey	180.00 – 185.15	6.15
Sandstone, fine to medium grained with quartz, feldspar, little micaceous mineral and shale, grey	185.15– 191.30	6.15
Sandstone fine grained creamish with shale, grey	191.30 – 200.60	9.30

TRIPURA UNIVERSITY CAMPUS, SURYAMANINAGAR (DUKLI BLOCK) – PZ (OW)

Lithology	Depth Range (mbgl)	Thickness (m)
Surface soil, brown, sandy	00.00 – 6.80	6.80
Sandstone, fine grained, brown	6.80 – 12.95	6.15
Sandstone, medium, brownish, with laterite, quartz and feldspar	12.95 – 25.25	12.30
Sandstone, medium to coarse, brown, with lateritic material and angular to sub-angular grains of quartz and feldspar.	22.25 – 37.55	15.30
Sandstone, coarse, brownish, with laterite, quartz and feldspar.	37.55 – 49.85	12.30
Sandstone, medium to coarse grained, brownish, with quartz, feldspar and ironaceous material.	49.85 – 62.15	12.30
Sandstone, fine to medium grained, whitish	62.15 – 71.45	9.30
Sandstone, fine to medium grained.	71.45 – 77.60	6.15
Sandstone, fine to medium grained, with shale grey	77.60 – 100.00	22.40

JIRANIA COCONUT SEED FIRM EW (JIRANIA BLOCK)

Lithology	Depth Range (mbgl)	Thickness (m)
Surface soil	0.00-3.00	3.0
Sandstone fine to medium, brownish yellow with quartz and feldspar and a few ferruginous material	3.00 -18.00	15
Sandstone , fine to medium, light brownish yellow mostly composed of quartz and feldspar	18.00 - 45.70	27.7
Sandstone, fine to medium, yellowish mostly composed of quartz and feldspar with a few mafics minerals	45.70 – 67.00	21.3
Sandstonefine to medium, buff colour, quartzitic & feldspathic with significant muscovite and a few ferruginous material	67.00 – 73.00	6.00

Sandstone, fine to medium, yellowish with quartz and feldspar	73.00 – 94.00	21.00
Sandstone , fine to medium grained , buff coloured, mostly composed of quartz and feldspar with ferruginous material	94.00 – 103.00	9.00
Sandstone, fine to medium, yellowish, quartzitic & feldspathic	103.00 -122.00	19.00
Sandstone, fine to medium, greyish, quartzitic & feldspathic	122.00 –219.60	97.6
Sand stone, fine to medium, greyish white, mostly composed of quartz and feldspar with a few mafics minerals	219.60 – 231.80	12.20

NAGICHERRA (HORTICULTURE RESEARCH CENTRE), (JIRANIA BLOCK) – PZ (EW)

Lithology	Depth Range (mbgl)	Thickness (m)
Surface soil, reddish	00.00 – 6.80	6.80
Sandstone, fine to medium grained, brownish mixed with little clay, white. Abundant lateritic pieces present.	6.80 – 9.95	3.15
Sandstone, fine to medium, brownish, abundant laterite pieces	9.95 – 16.10	6.15
Sandstone, fine, brownish mixed with little clay, lateritic pieces	16.10 – 19.10	3.00
Sandstone, fine to medium grained, brownish	19.10 – 22.25	3.15
Sandstone, fine grained, brownish mixed with little clay.	22.25 – 25.25	3.00
Sandstone, fine to medium, brownish. Abundant lateritic pieces	25.25 – 31.40	6.15
Shale, greymixed with sandstone, fine grained, brownish	31.40 – 34.55	3.15
Sandstone, fine grained, brownish mixed with little clay.	34.55 – 43.70	9.15
Sandstone, fine to medium grained, whitish.	43.70 – 56.00	12.30
Sandstone, fine to medium grained, whitish mixed with little clay	56.00 – 59.15	3.15
Sandstone, fine grained, whitish.	59.15 – 62.15	3.00
Sandstone, fine grained, whitish mixed with little shale, grey	62.15 – 65.30	3.15
Shale, greymixed with sandstone, fine grained, whitish	65.30 – 68.30	3.00
Sandstone, fine, whitish with little shale, grey. Pieces of iron	68.30 – 71.45	3.15
Sandstone, fine to medium grained, whitish mixed with shale, grey. Pieces of iron bearing minerals are present.	74.45 – 92.90	18.45
Sandstone, fine, light brownish. Pieces of iron bearing minerals	92.90 – 96.05	3.15
Sandstone, fine, light brownish with shale, grey. Pieces of iron	96.05 – 111.35	15.30
Sandstone, fine grained, light brownish.	111.35 – 139.10	27.75
Sandstone, fine to medium, light brownish. Pieces of iron minerals	139.10 – 142.10	3.00
Sandstone, fine, light brownish with little shale, grey. Pieces of iron bearing minerals are present.	142.10 – 160.55	18.45
Sandstone, fine to medium grained, light brownish. Pieces of iron bearing minerals are present.	160.55 – 179.00	18.45
Shale, grey mixed with sandstone, fine grained, light brownish.	179.00 – 185.15	6.15
Sandstone, fine grained, light brownish mixed with shale, grey.	185.15 – 197.45	12.30

NAGICHERRA (HORTICULTURE RESEARCH CENTRE), (JIRANIA BLOCK) – PZ (OW)

Lithology	Depth Range (mbgl)	Thickness (m)
Surface soil, reddish	00 – 6.80	6.80
Sandstone, fine to medium grained, brownish with lateritic pieces	6.80 – 37.55	30.75
Sandstone, fine grained, light brownish	37.55 – 52.85	15.30
Sandstone, fine grained, brownish mixed with shale, grey	52.85 – 68.30	15.45
Sandstone, fine grained, light brownish	68.30 – 117.30	49.00
Sandstone, fine to medium grained, light brownish	117.30 – 129.80	12.50
Shale, grey sandstone, fine grained, brownish	129.80 – 135.95	6.15

Sandstone, fine grained, brownish mixed with shale, grey	135.95 – 139.10	3.15
Sandstone, fine grained, brownish	139.10 – 142.10	3.00
Sandstone, fine grained, brownish mixed with shale, grey	142.10 – 148.25	6.15
Sandstone, fine to medium grained, light brownish	148.25 – 157.55	9.30
Sandstone, fine grained, brownish	157.55 – 166.70	9.15
Sandstone, fine to medium grained, brownish	166.70 – 169.85	3.15
Sandstone, fine grained, brownish mixed with little shale, grey	169.85 – 179.00	9.15
Sandstone, fine grained, greyish	179.00 – 200.45	21.85

BADHARGHAT (PHE SUB-DIVISION - X, AGARTALA), (DUKLI BLOCK) – PZ (EW)

Lithology	Depth Range(mbgl)	Thickness (m)
Sandstone, medium to coarse grained, light brownish	00.00 – 9.95	9.95
Shale, grey	9.95 – 16.10	6.15
Sandstone, medium grained, mixed with shale brownish.	16.10 – 22.25	6.15
Sandstone, fine grained, brownish	22.25 – 37.55	15.30
Sandstone, very fine grained, brownish	37.55 – 43.70	6.15
Sandstone, fine to medium grained, greyish	43.70 – 49.85	6.15
Sandstone, fine to medium grained, mixed with shale	49.85 – 74.45	24.60
Sandstone, coarse grained with quartz, feldspar and mica.	74.45 – 77.60	3.15
Sandstone, fine grained, mixed with shale, grey	77.60 – 111.35	33.75
Sandstone, medium to fine grained, whitish with shale, grey.	111.35 – 123.65	12.30
Shale, grey	123.65 – 129.80	6.15
Sandstone, fine to medium grained, whitish with shale, grey.	129.80 – 142.10	12.30
Sandstone, medium to fine grained, whitish.	142.10 – 154.40	12.30
Sandstone, fine to medium grained with shale, grey.	154.40 – 157.55	3.15
Sandstone, medium to fine grained, whitish.	157.45 – 166.70	9.25
Sandstone, fine to medium grained, creamish with shale, grey.	166.70 – 182.15	15.45
Sandstone, medium to fine grained, creamish.	182.15 – 188.30	6.15
Sandstone, fine to medium grained, creamish with shale, grey.	188.30 – 194.45	6.15
Sandstone, fine grained, creamish.	194.45 – 200.60	6.15

BADHARGHAT (PHE SUB-DIVISION-X, AGARTALA), (DUKLI BLOCK) – PZ (OW)

Lithology	Depth Range (mbgl)	Thickness (m)
Sandstone, medium to coarse grained, brown	00.00 – 6.80	6.80
shale, brown	6.80 – 12.95	6.15
Sandstone, medium grained, brownish, mixed with shale	12.95 – 25.25	12.30
Sandstone, fine to medium grained, brown, with lateritic material	22.25 – 37.55	15.30
Sandstone, fine grained, brownish.	37.55 – 49.85	12.30
Sandstone, fine to medium grained, greyish, mixed with shale	49.85 – 71.45	21.60
Sandstone, coarse grained, whitish	71.45 – 77.60	6.15
Sandstone, fine grained mixed with shale.	77.60 – 92.90	15.30

BODHJUNGNAGAR, GREATER AGARTALA (INDUSTRIAL GROWTH CENTER) – PZ (EW)

Lithology	Depth Range (m bgl)	Thickness (m)
Surface soil, clay mixed with fine sand, reddish	00.00 – 6.80	6.80
Sandstone, medium to fine grained, reddish brown, angular grains of quartz, feldspar and ironaceous material	6.80 – 12.95	6.15
Shale, greyish brown	12.95 – 22.10	9.15

Sandstone, medium to fine, brown, angular grains of quartz, feldspar and ironaceous material with shale and lateritic material	22.10 – 31.40	9.30
Sandstone, fine to medium grained, brownish	31.40 - 43.70	12.30
Sandstone, fine to medium, brownish mixed with shale, grey	43.70 – 56.00	12.30
Sandstone, fine to medium grained, brownish	56.00 – 74.45	18.45
Sandstone, fine to medium, brownish, with lateritic material	74.45 – 86.75	12.30
Sandstone, fine to medium grained, brownish	86.75 – 105.20	18.45
Shale, greyish brown	105.20 – 120.50	15.30
Sandstone, fine to medium, brownish mixed with shale, grey	120.50 – 123.65	3.15
Sandstone, fine to medium grained, brownish	123.65 – 126.65	3.00
Sandstone, fine to medium, brownish mixed with shale, grey	126.65 – 132.80	6.15
Sandstone, fine grained, brownish	132.80 – 154.40	21.60
Sandstone, fine to medium grained, light grey	154.40 – 182.00	27.60
Sandstone, fine to medium, light grey mixed with shale, grey	182.00 – 200.45	18.45

NARSINGARH, AGARTALA, (POLYTECHNIC INSTITUTE) – PZ (EW)

Lithology	Depth Range (mbgl)	Thickness (m)
Surface soil, reddish	00.00 – 6.80	6.80
Clay, brownish	6.80 – 28.40	21.60
Shale, gray	28.40 – 49.85	21.45
Shale, gray, mixed with sandstone,fine grained	49.85 – 59.15	9.30
Sandstone, fine grained, brownish mixed with shale, pieces of quartz and feldspar present	59.15 – 71.45	12.30
Sandstone, fine grained, whitish, mixed with shale, gray	71.45 – 80.60	9.15
Sandstone, fine to medium grained, greyish.	80.60 – 108.35	27.75
Sandstone, fine grained, whitish, mixed with shale, gray	108.35 – 111.35	3.00
Sandstone, fine to medium grained, greyish	111.35 – 117.50	6.15
Sandstone, fine grained, greyish, mixed with shale, gray	117.50 – 139.10	21.60
Shale, mixed with sandstone, fine grained, greyish	139.10 – 142.10	3.00
Sandstone, medium to fine grained, greyish.	142.10 – 145.25	3.15
Sandstone, fine grained, greyish	145.25 – 151.40	6.15
Sandstone, fine grained, greyish mixed with shale, grey	151.40 – 154.40	3.00
Sandstone, fine to medium grained, greyish.	154.40 – 169.85	15.45
Sandstone, fine grained, greyish mixed with shale, grey	169.85 – 179.00	9.15
Sandstone, fine grained, greyish	179.00 – 185.30	6.30
Shale, mixed with sandstone, fine grained, greyish	185.30 - 200.55	15.25

LICHUBAGAN, AGARTALA (MUNICIPALITY SECTOR OFFICE) – PZ (EW)

Lithology	Depth Range (mbgl)	Thickness (m)
Surface soil, brown, sandy	00.00 – 6.80	6.80
Sandstone, medium to coarse grained, brownish	6.80 – 12.95	6.15
Sandstone, medium to fine grained, brownish	12.95 – 43.70	30.75
Sandstone, fine grained, brownish	43.70 – 56.00	12.30
Sandstone, medium to fine grained, brownish	56.00 – 62.15	6.15
Sandstone, very fine grained, brownish,	62.15 – 65.30	3.15
Sandstone, medium to fine grained, brownish	65.30 – 92.90	27.60
Sandstone, medium to fine grained, mixed with little shale	92.90 – 99.05	6.15
Sandstone, medium to fine grained, brownish	99.05 – 105.20	6.15
Sandstone, medium to coarse grained, creamish	105.20 – 123.65	18.45
Sandstone, medium to fine grained, mixed with shale	123.65 – 129.80	6.15

Sandstone, medium to fine grained, greyish	129.80 – 151.40	21.60
Sandstone, medium to fine grained, mixed with shale	151.40 – 157.55	6.15
Sandstone, medium to fine grained, greyish	157.55 – 182.15	24.60
Sandstone, fine grained, mixed with shale	182.15 – 185.15	3.00
Sandstone, medium to fine grained, mixed with shale	185.15 – 197.45	12.30

GPA AGARTALA (OLD AGARTALA BLOCK)

Lithology	Depth Range (mbgl)	Thickness (m)
Sandstone reddish yellow fine grained	0.00-2.70	2.70
Sandstone reddish yellow fine grained	2.70-5.70	3.00
Sandstone yellow fine to coarse grained	5.70-28.40	22.70
Sandstone yellow medium coarse grained with quartz grains	28.40-3.40	3.00
Sandstone yellow fine medium to coarse very coarse grained	31.40-95.50	64.10
Sandstone grey, coloured fine to coarse with shale pieces	95.50-98.50	3.00
Shale grey coloured with fine gained sand	98.50-104.60	6.10
Sandstone, grey fine grained with shale pieces	104.60-110.70	6.10
Sandstone grey coloured, fine grained sandstone	110.70-129.00	18.30
Sandstone, grey coloured fine grained with shale pieces.	129.00-135.10	6.10
Sandstone, grey coloured fine grained, sandstone friable	135.10-147.30	12.20
Sandstone, grey coloured, fine grained with shale pieces.	147.30-150.40	3.10
Sandstone, grey coloured, fine gained	150.40-153.40	3.00
Shale grey coloured, with fine grained sandstone	153.40-159.40	6.00
Sandstone, grey, fine to medium grained	159.40-187.00	27.60
Shale, grey coloured with fine sandstone.	187.00-190.00	3.00

19 BSF CAMP SALBAGAN (OLD AGARTALA BLOCK) - 1979

Lithology	Depth Range (mbgl)	Thickness (m)
Sandy loam, Brown colour, fine grained with little clay	0.00-3.00	3.00
Sand, brown, fine grained with occasional medium grains sand and little mafic minerals	3.00-13.10	10.10
Sand, brown, fine to medium with occasional mafic minerals.	13.10-19.20	6.10
Sandy clay, brown, fine sand with admixture of clay and mafic	19.20-31.40	12.20
Sand brown fine to medium grained with very little clay content.	31.40-83.30	51.90
Sand brown colour, medium with very little clay and mafics.	83.30-89.40	6.10
Sandy clay, sand, fine grained with clay admixture and mafics.	89.40-92.40	3.00
Sandy gray, fine grained with little clay admixture in the top portion, **clay**content decreases downward.	92.42-101.60	9.20
Clay sandy, gray sticky with fine grained sand	101.60-116.80	15.00
Sand, gray, fine to medium with very little clay and mafics.	116.80-135.00	18.20
Clay sandy, gray sticky with fine grained sand, clay content increases in the middle	135.00-142.20	7.20
Sand, greyish fine grained with very little clay admixture sand becomes medium grains toward downward portion.	142.20-166.60	24.40
Clay sandy, greyish sticky with fine grained sand	166.60-172.70	6.10

Sand gray, fine grained with mafics minerals.	172.70-182.90	9.20
Clay sandy, greyish sticky with fine grained sand	182.90-184.90	3.00
Sand, greyish fine to medium grained with very little clay content, clay portion decreases downward.	184.90-203.20	18.30

19 BSF CAMP SALBAGAN (OLD AGARTALA BLOCK) – 2004

Lithology	Depth Range (mbgl)	Thickness (m)
Surface soil: Reddish brown with lateritic fragments mixed with brownish sand.	00.00-6.80	6.80
Shale: Mixed with fine grained sandstone, brown.	6.80-12.95	6.15
Sandstone: Fine grained ferruginous with little reddish shale.	12.95-34.55	21.60
Sandstone: Very fine grained light yellowish in colour.	34.55-49.85	15.30
Sandstone: Fine grained greyish brown in colour.	49.85-71.45	21.60
Sandstone: Fine grained brownish in colour.	71.45-77.60	6.15
Sandstone: Fine grained creamish in colour.	77.60-99.05	21.45
Sandstone: Fine grained greyish brown in colour.	99.05-105.20	6.15
Sand stone: Fine grained mixed with grey shale.	105.20-114.50	9.30
Sandstone: Fine grained light brownish in colour.	114.50-142.10	27.60
Sandstone: Fine grained greyish in colour.	142.10-148.25	6.15
Shale: Grey in colour.	148.25-154.40	6.15
Sandstone: Fine grained greyish in colour.	154.40-172.85	18.45
Sandstone: Fine to medium grained greyish in colour.	172.85-185.15	12.30
Sandstone: Fine to medium grained mixed with silt stone.	185.15-200.75	15.60

P&T COLONY, ARUNDHUTINAGAR, AGARTALA (DUKLI BLOCK)

Lithology	Depth Range (mbgl)	Thickness (m)
Shale, fine grained, grey	0.00-7.00	7.00
Sandstone, fine gained with piece of shale	7.00-13.30	6.30
Shale, fine grained	13.30-19.20	5.9
Sandstone, fine gained	19.20-52.70	33.50
Shale, fine grained	52.70-64.66	11.96
Sandstone, fine gained	64.66-69.54	4.88
Shale, fine grained	69.54-71.06	1.52
Sandstone, fine gained	71.06-78.69	7.63
Shale, fine grained	78.69-88.45	9.76
Sandstone, fine gained	85.45-92.11	6.66
Sandstone, fine gained with intermixing of shale	92.11-95.16	3.05
Sandstone, fine gained	95.16-99.43	4.27
Shale, fine grained	99.43-109.83	10.4
Sandstone, fine gained	109.83-148.84	39.01
Shale, fine grained	148.84-153.11	4.27
Sandstone, fine gained	153.11-162.26	9.15
Shale, fine grained	162.26-163.17	0.91
Sandstone, fine gained	163.17-171.10	7.93
Shale, fine grained	171.10-186.05	14.95

Sandstone, fine gained	186.05-205.20	19.15
Shale, fine grained	205.20-208.30	3.10
Sandstone, fine gained	208.30-211.30	3.00
Shale, fine grained	211.30-214.40	3.10
Sandstone, fine gained	214.40-226.60	12.20

BELBARI EW (BELBARI BLOCK)

Lithology	Depth Range (mbgl)	Thickness (m)
Sandy clay, yellowish brown, fine to medium grained.	0.00-10.00	10
Sandstone, light yellow, fine to medium grained.	10.00-19.00	9
Sand, light yellow, fine to medium, trace mica, slight ferruginous	19.00-40.00	21
Sand, yellowish grey, medium to fine, micaceous and the percentage ferruginous materials are higher than above.	40.00-74.00	34
Sand, yellowish grey, fine to medium micaceous with a few intercalation of shale, bluish.	74.00-77.00	3
Sand as above, but the percentage of shale is high.	77.00-86.00	9
Sand yellowish grey, medium to fine micaceous	86.00-100.00	14
Sand, yellowish grey, fine to medium with intercalation of shale	100.00-107.00	7
Sandy clay, bluish, sticky,	107.00-110.00	3
Sand, light grey, fine to medium with little clay,	110.00-120.00	10
Sand light grey, fine to medium with a few chips of shale.	120.00-150.00	30
Sand yellowish grey, medium to fine	150.00-225.00	75
Sand yellowish grey, fine to medium with little clay sticky.	225.00-233.00	8
Sand yellowish grey, medium to fine	233.00-257.00	24

FATIKCHERRA, BSF CAMPUS EW (LEFUNGA BLOCK)

Lithology	Depth Range (mbgl)	Thickness (m)
Surface soil, gray	00.00-3.00	3.00
Clay stone, light gray	3.00-6.80	3.80
Clay stone, dark gray in colour	6.80-16.10	9.30
Clay stone, dark gray mixed with fine grained sandstone	16.10-25.25	9.15
Clay stone, dark gray in colour	25.25-46.75	21.50
Clay stone, mixed with fine grained sandstone	46.75-55.90	9.15
Sandstone medium to fine grained mixed with clay stone	55.90-8380	27.9
Sandstone, medium grained with little clay stone	83.80-92.95	9.15
Sand stone, coarse grained with feldspar and quartz particles.	92.96-96.10	3.15
Sandstone, brownish medium to fine with feldspathic particles	96.10-105.25	9.15
Sandstone, brownish, medium to coarse grained with shale gray	105.25-114.55	9.3
Sandstone, brownish fine to medium with quartz, feldspar & mica	114.55-142.15	27.6
Sandstone, whitish, fine to medium with quartz and feldspar	142.15-169.75	27.6
Sandstone, very fine grained with silt stone	169.75-200.50	30.75

District – Sepahijala

GOKULNAGAR BSF CAMPUS EW (BISHALGARH BLOCK) - 2002

Lithology	Depth Range (mbgl)	Thickness (m)
Shale, brownish	0 – 6.80	6.80
Sandstone, fine, light brown with little ferruginous compound	6.80 – 16.10	9.30
Sandstone, medium to fine grained, brownish with quartz, feldspar & ferruginous materials	16.10 – 46.85	30.75
Sandstone, fine grained, brownish	46.85 – 49.85	3.00
Sandstone, medium to fine grained, brown, with quartz, feldspar & ferruginous materials	49.85 – 62.15	12.30
Sandstone, fine to medium, brownish with occasional laterites	62.15 – 68.30	6.15
Sandstone, medium to fine, brown, quartz & ferruginous nodules.	68.30 – 99.05	30.75
Shale, greyish, mixed with fine-grained sandstone.	99.05 – 105.20	6.15
Sandstone, medium to fine grained, light brownish.	105.20 – 108.35	3.15
Sandstone,fine to medium, brownish to gray & ferruginous grains	108.35 – 111.35	3.00
Sandstone, fine to medium, brownish with ferruginous nodules.	111.35 – 114.50	3.15
Sandstone,fine to medium grained, gray in colour with shale.	114.50 – 123.65	9.15
Sandstone,fine to medium, gray with ferruginous materials.	123.65 – 126.80	3.15
Sandstone,fine to medium grained, gray, mixed with shale.	126.80 – 139.10	12.30
Sandstone, fine grained, gray.	139.10 – 142.10	3.00
Sandstone, medium to fine grained, gray.	142.10 – 154.40	12.30
Sandstone,medium grained, gray.	154.40 – 160.55	6.15
Sandstone,fine to medium, light brown, mixed with shale gray.	160.55 – 163.70	3.15
Sandstone, gravelly**,** with shale gray,	163.70 – 200.00	36.30

KONABAN EW (BISHALGARH BLOCK)

Lithology	Depth Range (mbgl)	Thickness (m)
Sand fine to medium light yellowish brown	0.00-18.80	48.80
Sand fine to medium yellowish brown with few chips of shale	18.80-67.10	19.30
Sand fine to medium, light grey with few chips of shale	67.10-91.50	24.40
Shale with **minor fine sand**, grey amount decreasing with depth	91.50-179.90	88.40
Grey sticky **clay**.	179.90-280.60	100.70

GOLAGHATI EW (CHARILAM BLOCK)

Lithology	Depth Range (mbgl)	Thickness (m)
Sand fine to medium yellowish white	0.00-14.00	14.00
Sand fine to medium light brown	14.00-62.00	40.00
Sand fine to medium light gray, micaceous with little quartz and a few ferruginous material	62.00-72.00	9.20
Sand fine to medium dark gray, micaceous with quartz and a few ferruginous material	72.00-81.00	9.00
Sand fine to medium dark gray, with little clay, sticky	81.00-84.20	3.20
Sand fine to medium gray, micaceous with quartz and a few ferruginous material	84.20-108.60	24.40
Sand fine to medium dark gray, with chips of shale	108.60-114.60	60.00
Sand fine to medium gray, micaceous	14.60-142.10	27.50

Sand fine to medium gray, with chips of shale	142.10-151.20	9.10
Sand fine to medium gray, micaceous	151.20-186.20	35.00
Sandy clay light yellow, sticky	186.20-222.80	36.60
Sand fine to medium gray	222.80-270.00	47.20

GOKULNAGAR, BSF CAMP EW (BISHALGARH BLOCK) - 1976

Lithology	Depth Range (mbgl)	Thickness (m)
Clay: dark, reddish brown with little fine grained sand and mica.	0.00-3.00	3.00
Sandy clay: Reddish brown, sand fine to medium , clay sticky and soft sand content is about 30%	3.00-6.55	3.55
Sand: reddish brown, fine to medium, little micaceous clay (10%)	6.55-15.93	9.38
Clay: Redish brown, sticky, hard and micaceous, little fine sand.	15.93-19.31	3.38
Sandy clay: Reddish brown to dirty brown, fine to medium and occasionally coarse sand (Feldspar and quartz pieces of kankar)	19.31-28.69	9.38
Clay: Reddish brown, slightly micaceous with patches of dark brown, lateritic formation and 5% sand.	28.69-32.07	3.38
Sandy clay: Reddish brown to dirty brown, fine to medium occasionally coarse sand (Feldspar and quartz pieces of kankar)	32.07-63.92	31.85
Sand: Brownish gray to dark grey, fine to medium, micaceous	63.92-70.35	6.43
Clay: Dark grey to reddish brown with patches of lateritic material, sticky, hard with 20 to 30% of fine grained sand.	70.35-95.87	25.52
Clay: reddish brown to brown micaceous with patches of dark grey clay, fine grained sand is about 15%.	95.87-99.25	3.38
Sand: Reddish brown, fine to medium grained, micaceous with little admixture of clay, sand is occasionally coarse grained.	99.25-108.63	9.38
Sand: Reddish brown, fine to medium, mica, little dark grey sand	108.63-115.01	6.38
Sandy clay: reddish brown, fine to medium sand, micaceous with pieces of kankar, brown to grey coloured clay, sticky	115.01-118.39	3.38
Sand: Reddish brown, fine to medium with patches of lateritic material, silt content is about 10%, and occasional grey clay	118.39-127.97	9.58
Sandy clay: Reddish brown, fine to medium, micaceous with kankar, clay is sticky, hard, dirty grey and 30% of total volume.	127.97-134.15	6.38
Sand: Grey to brownish grey, fine to medium grained, micaceous, with pieces of kankar, silt content is about 10%.	134.15-175.81	41.66
Clayey sand: Grey to dark grey, miceceous sand, fine grained with pieces of kankar and clay (about 30-40%).	175.81-182.19	6.38
Clay: Grey to dark grey, sticky, hard, with medium and fine sand	182.19-204.33	22.14

District – Gomati

TULAMURA EW (KANKRABAN BLOCK)

Lithology	Depth Range (mbgl)	Thickness (m)
Sandy loam, light pink, fine grained	0.00-4.50	4.50
Sand brown, fine to medium grained	4.50-7.00	2.50
Clay sandy, brown, plastic with fine grained sand.	7.00-34.00	27.00
Clay, brownish grey, plastic, sticky and hard.	34.00-52.00	18.00
Clay sandy grey to brownish grey, plastic and sticky along with fine grained sand	52.00-73.00	19.00
Sand brown, fine to medium grained	73.00-115.00	42.00
Sand grey, fine to medium grained	115.00-123.00	18.00
Sand clayey, grey, medium grained along with little plastic and sticky clay.	123.00-151.00	18.00
Sand grey, fine to medium grained	151.00-157.00	6.00
Clay sandy, grey, plastic and sticky with admixture of medium grained sand.	157.00-175.00	18.00
Sand clayey, grey, medium grained with little plastic clay.	175.00-178.00	3.00
Sand grey, mostly medium grained and very little amount of clay.	178.00-247.00	69.00

AMARPUR EW (AMARPUR BLOCK)

Lithology	Depth Range (mbgl)	Thickness (m)
Shale, greyish, mixed with sandstone	0.00 – 9.98	9.98
Sandstone, fine grained, brownish mixed with shale	9.98 – 25.74	15.76
Sandstone, fine grained, greyish mixed with shale	25.74 – 35.50	9.76
Sandstone, fine to medium grained, greyish mixed with shale	35.50 – 73.78	38.28
Sandstone, fine to medium grained, greyish	73.78 – 83.16	9.38
Sandstone, fine grained, greyish mixed with shale	83.16 – 95.92	12.76
Sandstone, fine to medium grained, greyish	95.92 –115.06	19.14
Sandstone, fine grained, greyish mixed with shale	115.06 – 127.82	12.76
Sandstone, fine to medium grained, greyish	127.82 – 143.58	15.76
Sandstone, fine grained, greyish mixed with shale	143.58 – 153.34	9.76
Sandstone, fine to medium grained, greyish	153.34 – 178.86	25.52
Sandstone, fine grained, greyish mixed with shale	178.86 – 191.62	12.76
Shale, greyish	191.62 – 210.76	19.14
Shale, greyish mixed with fine grained sandstone	210.76 – 250.42	44.66

OMPINAGAR EW (OMPI BLOCK)

Lithology	Depth Range (mbgl)	Thickness (m)
Sandy clay, fine sands with clay costing gray to brown in colour with little admixture of mica.	0.00-3.00	3.00
Sand brown to yellowish brown, fine grained sand, with mica	3.00-6.55	3.55
Sandy clay, brown to yellowish brown, fine grained sand with abundance of clay materials.	6.55-9.93	3.38
Sand, Brown sand with greyish ting, fine grained moderately sorted, with abundance of mica.	9.93-16.31	6.38
Sandy clay, brown to yellowish brown, fine grained with clay.	16.31-19.31	3.00
Sand, Grey to brownish grey, medium to fine grained sand,	19.31-25.69	6.38

moderately sorted, sub rounded with abundance of mica		
Sandy clay, grey with little blackish shale's, sand fine grained and moderately sorted sand and clay ratio 50:50	25.69-29.07	3.38
Sand, brownish grey, medium grained sub rounded sands, with abundance of mica flakes and occasional chips of shale.	29.07-35.45	6.38
Sandy clay, gray fine grained with admixture of clay (50:50) poorly sorted, iron con-creations present, ample flakes of mica	35.45-48.85	12.80
Sand grey coloured, medium grained moderately sorted with very little amount of clay pieces of shale and iron concretion present a few grains of mafic minerals.	48.25-73.73	25.48
Sand with little clay, grey coloured fine to medium grained sand with abundance mafics, shale pieces are also present clay content is little high compared to the above unit.	73.73-76.73	3.00
Sandy clay, Grey colour, fine grained, sand poorly sorted, with abundance of mafics shale particles, clay admixture, carbonaceous material and numerous from pyrites observed.	76.73-80.11	3.38
Sand grey coloured medium grained with abundance of mafics and iron pyrites.	80.11-83.11	3.00
Sandy clay, grey, medium to fine moderate sub rounded sand mixed with clay and carbonaceous material with pyrites	83.11-92.87	9.76
Sand, grey coloured, medium grained, moderately sorted sand grained, sub rounded with very little clay.	92.87-99.25	6.38
Sand with little clay, sand, grey, coloured fine grained clay, content with little higher than the above, abundance of mica	99.25-102.25	3.00
Sandy clay, sand gray coloured fine grained with little clay admixture of mafics.	102.25-108.63	6.38
Sand grey, fine to medium grained moderately sorted sub rounded with little amount of clay, flakes of mica and little mafics	108.63-131.15	22.52
Sandy clay, grey, fine grained, clay portion in higher than the above formation mica and mafics are abundance.	131.15-140.53	9.38
Sand, grey, fine grained, moderately sorted sand pieces of fossil wood present, clay content is very less.	140.53-150.29	9.76
Sand with little clay, grey, fine grained, moderately sorted, with slightly higher clay content.	150.20-153.29	3.00
Sandy clay, Grey, fine moderately sorted sub rounded with still higher clay content, and abundance of mafics and mica flakes.	153.29-178.81	25.52
Sand, grey coloured medium to fine grained sub rounded, moderately sorted, sand with pieces with fossil wood	178.81-182.19	3.38
Clay, grey to dark gray, sticky, with abundance with mafics	182.19-239.51	57.32
Sandy clay, Grey, fine little compact, with abundant mafics.	239.51-242.51	3.00
Clay, grey to dark grey, fine grained, sticky with abundance of mafics and mica.	242.51-250.00	8.51

DHUPTALI EW (MATABARI BLOCK)

Lithology	Depth Range (mbgl)	Thickness (m)
Sandstone, fine grained, brownish	00.00 – 31.10	31.10
Sandstone, fine grained, brownish mixed with shale	31.10 – 34.20	3.10
Shale, brownish	34.20 – 37.20	3.00
Sandstone, fine grained, brownish	37.20 – 52.50	15.30
Shale, brownish	52.50 – 55.50	3.00
Sandstone, medium grained, greyish mixed with shale	55.50 – 147.00	91.50
Shale, greyish, mixed with fine grained sand stone, fine grained	147.00 – 208.00	61.00

District – South Tripura

BAGAFA BSF CAMPUS EW (BAGAFA BLOCK)

Lithology	Depth Range (mbgl)	Thickness (m)
Surface soil, brown, with lateritic fragments	00.00 – 3.00	3.00
Shale, mixed with ferruginous sandstone.	3.00 – 12.00	9.00
Shale, gray.	12.95 – 16.50	3.55
Sandstone, fine grained, greyish white.	16.50 – 19.50	3.00
Shale, gray.	19.50 – 27.50	8.00
Sandstone, fine grained, greyish	27.50 – 30.50	3.00
Shale, mixed with fine grained sand stone, greyish	30.50 – 43.00	12.50
Sandstone, fine grained, greyish	43.00 – 47.00	4.00
Shale, mixed with fine grained sandstone	47.00 – 73.50	26.50
Sandstone, fine grained, greyish	73.50 – 76.00	3.00
Shale, gray	76.00 – 81.50	4.50
Sandstone, fine grained, greyish	81.50 – 86.00	4.50
Shale, mixed with fine grained sandstone	86.00 – 91.00	5.00
Sandstone, fine, greyish white & occasional mafic minerals	91.00 – 94.50	3.50
Shale, with fine grained sandstone	94.50 – 102.20	25.70
Sandstone, fine grained, greyish	102.20 – 106.00	3.80
Shale, with fine grained sandstone	106.00 – 109.00	3.00
Sandstone, fine to medium grained, greyish white.	109.00 – 114.00	5.00
Shale, gray	114.00 –115.50	1.50
Sandstone, fine to medium grained, greyish white.	115.50 – 119.50	3.00
Shale, gray	119.50 – 123.00	3.50
Sandstone, fine grained, greyish	123.00 – 131.00	8.00
Sandstone, fine grained, mixed with shale	131.00 – 137.50	6.50
Sandstone, fine to medium grained, greyish white.	137.50 – 150.00	12.50
Sandstone, fine grained, mixed with shale	150.00 – 158.00	8.00
Sandstone, fine grained, greyish	158.00 – 175.00	17.00
Sandstone, very fine grained, mixed with siltstone	175.00 – 197.50	22.50

SATCHAND EW (SATCHAND BLOCK)

Lithology	Depth Range (mbgl)	Thickness (m)
Surface soil, brown	00.00 – 3.00	3.00
Shale, brownish.	3.00 – 7.00	4.00
Sandstone, fine to medium grained, brownish mixed with shale	7.00 – 13.40	6.40
Sandstone, fine to medium grained, brownish	13.40 – 34.40	21.00
Sandstone, fine to medium grained, greyish mixed with shale	34.40 – 58.40	24.00
Sandstone, fine to medium grained, greyish	58.40 – 64.40	6.00
Shale, greyish, mixed with fine to medium grained sand stone	64.40 – 70.40	6.00
Sandstone, fine to medium grained, greyish	70.40 – 235.40	165.00
Sandstone, fine to medium grained, greyish mixed with shale	235.40 – 238.40	3.00
Sandstone, fine to medium grained, greyish	238.40 – 253.40	15.00

RAJNAGAR EW (RAJNAGAR BLOCK)

Lithology	Depth Range (mbgl)	Thickness (m)
Sand, brownish yellow, fine to medium grained with clay between 8.23 and 11.27m.	0.00-11.27	11.27
Sand, brownish, yellow, medium to coarse grained with clay intercalations between 38.1-39.62 and 42.67-44.20	11.27-65.53	54.26

Claysandy grey , sticky clay with fine grained sand	65.53-99.05	33.52
Clay, grey sticky, little admixture of sand.	99.05-109.73	10.68
Sand, light gray, fine to medium grained sand.	109.73-124.96	15.23
Sand clayey, light gray sand with grey clay.	124.96-135.63	11.67
Sand, light gray, fine to medium grained (mostly medium)	135.63-150.87	15.24
Clay, grey sticky with little admixture of sand.	150.87-154.84	3.97
Sand, light gray, fine to medium grained sand.	154.84-165.52	10.68
Clay, grey sticky with little amount of sand.	165.52-166.43	0.91
Sand ,light gray mostly medium grained sand	166.43-183.80	17.37
Sand clayey, grey, mostly medium grained sand with grey clay.	183.80-190.42	6.62
Sand, gray, fine to medium grained sand sub rounded.	190.42-193.42	3.00
Clay sandy, grey to brownish yellow plastic sticky clay with admixture of fine sand	193.42-245.30	51.88
Sand, gray, fine to medium grained with a little clay.	245.30-249.24	3.94
Clay sandy, grey, sticky clay with admixture of grey clay.	249.24-177.00	
Shale grey with intercalation of sandstone.	177.00-193.00	14.00
Sandstone, grey fine to medium with shale	193.00-204.00	11.00
Shale, grey, brittle	204.00-207.00	3.00
Sandstone, grey, fine to medium grained.	207.00-225.00	18.00
Shale, grey, brittle	225.00-227.00	2.00
Sandstone gray, fine to medium with little intercalation of shale.	227.00-247.00	20.00
Shale, grey, brittle with fine grained sandstones.	247.00-294.00	47.00

HARIPUR EW (HRISHYAMUKH BLOCK)

Lithology	Depth Range (mbgl)	Thickness (m)
Surface clay, Yellowish in colour	00-6.65	6.65
Clay, Sticky, yellowish in colour	6.65-28.05	21.40
Clay, Black in colour with minute fine grained sand.	28.05-31.05	3.00
Clayey sandstone, Brown in colour sand fine grained	31.05-37.15	6.10
Clay, sticky , brown to dirty brown with some feldsper and mica	37.15-67.65	30.50
Clayey sandstone, yellow in colour sand fine grained	67.65-76.85	9.20
Sandstone, Medium to coarse grained, yellowish in colour	76.85-95.15	18.30
Clay, sticky, grey in colour	95.15-104.25	9.10
Sandstone, Grey fine to medium grained	104.25-113.45	9.20
Clay, Reddish brown in colour, mixed with little sand	113.45-143.95	30.50
Sandstone, fine to medium grained, yellowish in colour.	143.95-150.05	6.10
Clayey sandstone, Yellowish in colour sand fine grained	150.05-153.05	3.00
Clay Sticky grey in colour	153.05-159.15	6.10
Sandstone, Medium to fine grained yellowish in colour.	159.15-201.85	42.70

HARIPUR OW (HRISHYAMUKH BLOCK)

Lithology	Depth Range (mbgl)	Thickness (m)
Surface clay, Redish brown	00-6.65	6.65
Clay, sticky, reddish brown in colour occasionally with little sand	6.65-55.45	48.80
Sandstone, fine to medium grained reddish brown in colour.	55.45-61.45	6.00
Sandy clay, grey in colour, sand occasionally fine grained	61.45-64.65	3.20
Clay grey in colour occasionally with little snd	64.65-114.55	49.90
Sandy clay yellowish brown in colour sand fine gained.	114.55-168.35	53.80
Sandstone, Medium grained yellowish in colour.	168.35-189.55	21.20

PASCHIM JALEFA EW (SATCHAND BLOCK)

Lithology	Depth Range (mbgl)	Thickness
Top Soil with Silt and Clay, Top Soil comprising clay yellowish brown, semisticky and minor very fine sand and silt.	0-3.5	3.5
Clay, steel grey hard sticky	3.5-6.8	3.3
Clay, yellowish grey semisticky	6.8-15.9	9.1
Clay, yellow semisticky	15.9-19	3.1
Sand fine to medium, yellow with minor clay greyish yellow semi-sticky with a few brown ferruginous concretions.	19-25.1	6.1
Sand medium to coarse, mainly yellow and slightly greyish yellow with a few brown ferruginous concretions.	25.1-31.2	6.1
Sand medium to coarse, light grey, transparent, yellowish grey with a few brown ferruginous concretions and rock fragments with quartz	31.2-34.2	3
Sand clayey : sand fine to medium, light grey to minor yellowish grey & dark grey clay	34.2-40.3	6.1
Sand, medium to coarse and colour varied from yellow, light yellow and greyish yellow to yellowish grey and then grey mixed with a significant amount of brown ferruginous kankar and rock fragments including quartz	40.3-55.6	15.3
Sand, fine to medium, light yellow, greyish yellow, yellowish grey and light grey with a few rock fragments including shale and quartz	55.6-64.7	9.1
Sand medium to coarse, light yellow, yellow and greyish yellow with minor amount of medium gravel sized rock fragments and brown ferruginous kankar	64.7	9.2
Sand fine to medium, transparent, light yellow, greyish yellow, yellowish grey, grey with a few large quartz fragments, brown ferruginous kankar and other rock fragments	73.9-122.7	48.8
Sand very fine to medium, transparent, light yellow, greyish yellow, yellowish grey with little clay yellowish grey to earthy	122.7-128.8	6.1
Clay grey to dark grey, semi-sticky with minor sand very fine to fine, yellowish grey to grey & transparent.	128.8-134.9	6.1
Sandy Clay, clay semi-sticky, grey to light grey with minor sand, very fine to fine, minor medium sized, yellowish grey, transparent, grey	134.9-137.9	3
Sand, fine to medium, yellow, light yellow, greyish yellow, beige, transparent, off-white, mainly quartzitic and minor blackish grey to dark brown ferruginous grains.	137.9-153.2	15.3
Sand, medium grained, yellow, light yellow, off-white, transparent mixed with appreciable amount of semi-sticky variegated clay in the form of pellets	153.2-156.2	3

Sand, medium, yellow, light yellow, beige, mixed with rock fragments (mainly brown chert nodules/kankar, transparent & white quartz fragments) & little variegated clay	156.2-165.4	9.2
Sand, fine to medium grained, light grey, yellowish grey and transparent mixed with rock fragments, ferruginous concretion/kankars	165.4-175.5	10.1

PASCHIM JALEFA OW (SATCHAND BLOCK)

Lithology	Depth Range (mbgl)	Thickness
Top Soil with Silt and Clay, Top Soil comprising clay yellowish brown, semisticky and minor very fine sand and silt.	0-3.5	3.5
Clay, steel grey hard sticky	3.5-6.8	3.3
Clay, yellowish grey semisticky	6.8-15.9	9.1
Clay, yellow semisticky	15.9-19	3.1
Sandfine tomedium, yellow with minor clay greyish yellow semi-sticky with a few brown ferruginous concretions.	19-25.1	6.1
Sand medium to coarse, mainly yellow and slightly greyish yellow with a few brown ferruginous concretions.	25.1-31.2	6.1
Sand medium to coarse, light grey, transparent, yellowish grey with a few brown ferruginous concretions and rock fragments with quartz	31.2-34.2	3
Sand clayey : sand fine to medium, light grey to minor yellowish grey and dark grey clay	34.2-40.3	6.1
Sand, medium to coarse and colour varied from yellow, light yellow and greyish yellow to yellowish grey and then grey mixed with a significant amount of brown ferruginous kankar and rock fragments including quartz	40.3-55.6	15.3
Sand, fine to medium, light yellow, greyish yellow, yellowish grey and light grey with a few rock fragments including shale and quartz	55.6-64.7	9.1
Sand medium to coarse, light yellow, yellow and greyish yellow with minor amount of medium gravel sized rock fragments and brown ferruginous kankar	64.7-73.9	9.2
Sand fine to medium, transparent, light yellow, greyish yellow, yellowish grey, grey with a few large quartz fragments, brown ferruginous kankar and other rock fragments	73.9-122.7	48.8
Sand very fine to medium, transparent, light yellow, greyish yellow, yellowish grey with little clay yellowish grey to earthy	122.7-128.8	6.1
Clay grey to dark grey, semi-sticky with minor sand very fine to fine, yellowish grey to grey & transparent.	128.8-134.9	6.1
Sandy Clay, clay semi-sticky, grey to light grey with minor sand, very fine to fine, minor medium sized, yellowish grey, transparent, grey	134.9-137.9	3
Sand, fine to medium, yellow, light yellow, greyish yellow, beige, transparent, off-white etc. mainly quartzitic and minor amount of blackish grey to dark brown ferruginous grains.	137.9-153.2	15.3
Sand, medium grained, yellow, light yellow, off-white, transparent mixed with appreciable amount of semi-sticky variegated clay in the form of pellets	153.2-156.2	3
Sand, medium, yellow, light yellow, beige, with rock fragments (mainly brown chert nodule /kankar and transparent & white quartz fragments) and little variegated clay pellets.	156.2-165.4	9.2
Sand, fine to medium grained, light grey, yellowish grey and transparent mixed with rock fragments, ferruginous concretion/kankars	165.4-175.5	10.1

TUICHAMA EW (SATCHAND BLOCK)

Lithology	Depth Range (mbgl)	Thickness
Top Soil lateritic comprising Sand, Silt and Clay: Sand very fine to fine, brown and yellowish brown and minor silt and clay semi-sticky brown and reddish brown.	0-6.8	6.8
Clay: very hard, sticky with variegated colour (brown, reddish brown, yellow, off-white, beige, grey)	6.8-9.8	3
Sand: medium to fine, quartzitic, yellow, brownish yellow etc.	9.8-12.8	3
Sand: fine to coarse, quartzitic, yellow, orangish yellow, brownish yellow mixed with minor amount of small to medium gravel (sub-angular to sub-rounded quartz fragments and brown chert nodules)	12.8-19	6.2
Gravel : medium to large quartzitic, sub-angular to sub-rounded (white, off-white, yellowish white, yellow, brownish yellow, transparent) and ferruginous chert, sub-rounded to rounded, brown	19-23.5	4.5
Clay : very hard, sticky, variegated colour (brown, reddish brown, yellow, off-white, beige, grey)	23.5-34.1	10.6
Sand clayey : fine, light yellow, yellow, transparent, minor clay yellow and brown ferruginous kankar	34.1-37.3	3.2
Sand : fine to medium, little clay yellow and sizeable chert nodules, light brown to brown	37.3-40.4	3.1
Sand : fine yellow mixed with little gravel	40.4-43.5	3.1
Sand : fine to medium, buff, pinkish white, white with gravel small quartzitic and chert nodules	43.5-46.5	3
Sand : fine to medium, yellow, yellowish white, white, orangish white, off-white, brownish yellow	46.5-49.5	3
Sandy Clay : Clay plastic semi-sticky, yellowish, yellowish brown and sometimes variegated with minor sand fine, yellow, brownish yellow, light yellow, off-white etc.	49.5-58.5	9
Clayey Sand : Sandfine with clay, yellow, yellowish brown and variegated at places	58.5-61.6	3.1
Clayey Sand : Sand fine to medium, quartzitic, light yellow, yellow, brownish yellow, off-white, transparent with minor clayvariegated (light brown, yellow, yellowish brown, off-white, light grey)	61.6-67.6	6.1
Sand with Clay : Sand fine to medium, quartzitic, light yellow, brownish yellow, transparent, off-white; variegated claylight brown, yellow, yellowish brown, off-white, light grey; minor small to medium gravel	67.7-70.8	3.1
Sand : fine to medium, deep yellow, yellowish transparent, orangish yellow, yellowish white and minor white sand; little brown ferruginous kankar and quartz frags. white & yellowish transparent.	70.8-92.2	21.4
Sand : medium to coarse, yellow, light yellow, yellowish transparent, yellowish white, transparent mainly quartzitic and minor amount of deep brown to brown ferruginous cherts of coarse sand size.	92.2-95.2	3
Sandy Clay : plastic, nonsticky, light yellow with minor sand fine to medium, light yellow, yellowish transparent, yellowish white, transparent and chert fragments, small gravel sized, deep brown.	95.2-98.5	3.3
Sand : fine to medium, light yellow, yellowish transparent, yellowish white, transparent with little gravel small sized (mainly brown chert nodules/kankar and transparent & white quartz fragments).	98.5-101	2.5
Sand : fine to medium grained, mostly light yellow, yellowish transparent , off-white, orangish light yellow coloured and also some white and transparent grains	101-104.5	3.5
Clayey Sand : Sand fine, light yellow, yellowish transparent, off-white,	104.5-113.5	9

orangish yellow and some white and transparent grains with little clay, non-sticky, plastic, light grey, beige, yellowish grey.		
Sand : fine, light yellow, yellowish transparent , off-white, orangish white with few white, deep brown & transparent grains mixed with a few ferruginous nodules, reddish to dark brown & white quartz.	113.5-116.5	3
Sand : fine to medium, mainly yellow, yellowish transparent, orangish yellow, off-white, deep yellow, reddish yellow with a few ferruginous nodules, minor coarse sand and little small gravels.	116.5-128.8	12.3
Sand : medium to coarse, light yellow, greyish yellow, light grey, off-white, white mixed with abundant small to medium gravel sized brown to deep brown chert & little quartz, white, yellow, yellowish white.	128.8-135	6.2
Sand with Chert Nodules : medium to coarse, light yellow, off-white and minor amount of white, reddish yellow, brownish yellow and small to medium gravel sized brown to deep brown chert nodues	135-140.3	5.4
Sand : fine to medium, light yellow, off-white, reddish & brownish yellow, little clay light yellow, plastic	140.3-147.1	6.6
Sand : mainly medium and minor fine grained, light yellow, greyish yellow, yellowish transparent, off-white and less reddish yellow and brownish yellow.	147.1-153.2	6.1
Sand : fine, light yellow, yellow, orangish yellow, off-white, yellowish transparent	153.2-159.5	6.3
Clay : semi-sticky, plastic, light yellow to greyish yellow with minor sand, fine, light yellow, yellow, orangish yellow, off-white, yellowish transparent and very little chert	159.5-171.5	12
Sand : fine, orangish yellow, light yellow, off-white, yellowish transparent; trace clay	171.5-174.5	3

TUICHAMA OW (SATCHAND BLOCK)

Lithology	Depth Range (mbgl)	Thickness
Top Soil lateritic comprising Sand, Silt and Clay: Sand very fine to fine, brown and yellowish brown, minor silt and clay semi-sticky yellowish brown and reddish brown.	0-6.8	6.8
Clay: hard, sticky with variegated colour (brown, reddish brown, yellow, off-white, beige, grey, light grey etc.)	6.8-9.8	3
Sand: medium to fine, quartzitic, yellow, brownish yellow etc.	9.8-13	3.2
Clay non-sticky brownish yellow with minor sand fine to medium	13-19.05	6.05
Sand fine to medium with minor clay brownish yellow	19.05-22	2.95
Clay non-sticky brownish yellow with minor sand fine to medium	22-25.5	3.5
Sand fine with minor clay brownish yellow	25.5-28	2.5
Sand fine with clay brownish yellow	28-31.2	3.2
Sand fine with minor clay earthy yellow	31.2-40.4	9.2
Sand very fine to fine with clay earthy yellow	40.4-43.5	3.1
Sand fine reddish brown, yellow, light brown, yellowish transparent with trace clay	43.5-49.5	6
Sand fine reddish brown, yellow, light brown, yellowish transparent with minor clay variegated to yellow to brownish yellow.	49.5-52.8	3.3
Sand fine reddish brown, yellow, light brown, yellowish transparent	52.8-61.8	9
Sand fine to medium yellow, brownish yellow	61.8-67.8	6
Sand fine to medium yellow, brownish yellow with clay light yelow	67.8-74	6.2
Sand medium (major), fine (minor), yellow, brownish yellow, yellowish brown, orangish	74-80	6

Sand fine to medium, yellow, brownish yellow, yellowish brown, orangish mixed with minor white quartz fragments, brown chert fragments and clay yellow, yellowish brown	80-98.4	18.4
Sand fine, yellow, light yellow, brownish yellow, yellowish brown, orangish, off-white with minor clay yellowish light brown.	98.4-104.3	5.9
Sand fine to medium, light yellow, brownish yellow, yellowish brown, orangish, offwhite	104.3-116.6	12.3
Sand fine to medium light yellow, off-white, yellowish transparent, orangish yellow, brownish yellow with trace clay light grey	116.6-122.6	6
Sand fine to medium greyish yellow, off-white with a few quartz fragments small to large	122.6-128.8	6.2
Sand fine to medium light yellow, yellowish transparent, orangish yellow	128.8-141	12.2
Sand fine to medium light yellow, yellow, brownish yellow, orangish and reddish yellow	141-147	6
Sand fine to medium light yellow, yellow, brownish yellow, orangish and reddish yellow with minor clay variegated grey, off-white, yellow and brownish yellow	147-153	6
Sand medium (major), fine (minor), yellow, light yellow, yellowish transparent, orangish yellow, off-white mixed with minor brown ferruginous kankar/chert nodules	153-160	7

RAJIB NAGAR EW (SATCHAND BLOCK)

Lithology	Depth Range (mbgl)	Thickness
Top Soil lateritic comprising Sand, Silt and Clay: Sand very fine to fine, brown and yellowish brown, minor silt and clay semi-sticky yellowish brown and reddish brown.	0-6.8	6.8
Clay: hard, sticky with variegated colour (brown, reddish brown, yellow, off-white, beige, grey, light grey etc.)	6.8-9.8	3
Sand: medium to fine, quartzitic, yellow, brownish yellow etc.	9.8-13	3.2
Clay non-sticky brownish yellow with minor sand fine to medium	13-19.05	6.05
Sand fine to medium with minor clay brownish yellow	19.05-22	2.95
Clay non-sticky brownish yellow with minor sand fine to medium	22-25.5	3.5
Sand fine with minor clay brownish yellow	25.5-28	2.5
Sand fine with clay brownish yellow	28-31.2	3.2
Sand fine with minor clay earthy yellow	31.2-40.4	9.2
Sand very fine to fine with clay earthy yellow	40.4-43.5	3.1
Sand fine reddish brown, yellow, light brown, yellowish transparent with trace clay	43.5-49.5	6
Sand fine reddish brown, yellow, light brown, yellowish transparent with minor clay variegated to yellow to brownish yellow.	49.5-52.8	3.3
Sand fine reddish brown, yellow, light brown, yellowish transparent	52.8-61.8	9
Sand fine to medium yellow, brownish yellow	61.8-67.8	6
Sand fine to medium yellow, brownish yellow with clay light yellow	67.8-74	6.2
Sand medium (major), fine (minor), yellow, brownish yellow, yellowish brown, orangish	74-80	6
Sand fine to medium, yellow, brownish yellow, yellowish brown, orangish mixed with minor white quartz fragments, brown chert fragments and clay yellow, yellowish brown	80-98.4	18.4
Sand fine, yellow, light yellow, brownish yellow, yellowish brown, orangish, off-white with minor clay yellowish light brown.	98.4-104.3	5.9
Sand fine to medium, light yellow, brownish yellow, yellowish brown,	104.3-116.6	12.3

orangish, offwhite		
Sand fine to medium light yellow, off-white, yellowish transparent, orangish yellow, brownish yellow with trace clay light grey	116.6-122.6	6
Sand fine to medium greyish yellow, off-white with a few quartz fragments small to large	122.6-128.8	6.2
Sand fine to medium light yellow, yellowish transparent, orangish yellow	128.8-141	12.2
Sand fine to medium light yellow, yellow, brownish yellow, orangish and reddish yellow	141-147	6
Sand fine to medium light yellow, yellow, brownish yellow, orangish and reddish yellow with minor clay variegated grey, off-white, yellow and brownish yellow	147-153	6
Sand medium (major), fine (minor), yellow, light yellow, yellowish transparent, orangish yellow, off-white mixed with minor brown ferruginous kankar/chert nodules	153-160	7

RAJAPUR EW (BOKAFA BLOCK)

Lithology	Depth Range (mbgl)	Thickness
Sand, Light brown to brown, fine to medium grained with mafic minerals.	0.00-25.89	25.89
Clay, Sandy, brownish grey to brown, sticky with fine grained sand	25.89-38.01	12.12
Sand, Grey fine to coarse grained along with pieces of gravel and mafics	38.01-53.09	15.08
Clay, Sandy, grey, fine to medium grained sand with quartz.	53.09-55.01	1.92
Sand, Grey, medium grained with pieces of ferromagnesian minerals and mica.	55.01-94.98	49.97
Clay, Sandy, grey with very fine grained sand.	94.98-107.04	12.06
Clay, Grey, sticky with admixture of fine grained sand.	107.04-118.99	11.95
Sand, Grey, fine to medium grained with mafic minerals and clay.	118.99-127.99	9.00
Clay, Grey, sticky with little fine grained sand.	127.99-140.00	12.01
Clay, Sandy, grey, clay plastic with fine grained sand.	140.00-149.06	9.06
Clay, Grey, sticky with a admixture of sand.	149.06-165.03	16.97
Clay, Grey plastic with very little sand.	165.03-167.03	2.00
Sand, Grey medium grained, subrounded with clay.	167.03-175.03	8.00
Clay, Sandy, grey, clay plastic with fine grained sand.	175.03-178.95	3.92
Clay, Grey, sticky with sand.	178.95-187.84	8.89
Clay, Sandy, grey, clay plastic with fine grained sand.	187.84-195.71	15.87
Sand, Grey, fine grained with clay.	195.71-251.54	55.83

DETAILS OF DISTRICT WISE CGWB EXPLORATION WITH REFERENCE TO VALLEYS AND RIVER BASINS

1. Hydrogeological Details of Ground Water Exploration in North Tripura

Sl. No.	Site name/ Block / Co-ordinates	Surface elevation (m. amsl)	Drilling period	Depth Drilled/ Assembly length(m)	Position of slot (m)	Thickness of aquifer tapped (m)	SWL (m bgl)	Discharge		Draw Down (m)	Specific capacity (lpm/ mdd)	Transm-issivity (m^2/day)	Perme-ability (m/day)	Stora-tivity	Remark
								m^3/hr	lps						
Dharmanagar Valley & Juri Basin (North Tripura District)															
1.	**Ichaicherra**			255.2/209	72-85, 110-140 182-192, 201-206	56	0.42 agl	24.4	6.77	23.4	16.6	7.8	0.1	-	Auto Flow EW
2.	**Nayapara**			251.8/160	66-73, 77-103 128-145, 148-157	59	2.34 agl	82.4	22.88	25.43	54.3	74.3	12.6	2.7×10^{-4}	Auto Flow EW
3.	**Haflongcherra**			232.7/180	80-98, 134-154 158-176	44	17.20	3.9	1.08	23.35	2.7	20	0.4	-	EW
4.	**Dharmanagar**			251/210	59-80, 135-156 183-204	63	7.15	22.5	6.25	4.30	87.2	340	5.4	-	EW
5.	**Sanicherra**			250.3/237	73-76, 90-95 151-172, 184-198 204-213, 221-234	59	6.47	11.4	3.16	31	6.1	5.7	-	-	EW
6.	**Tilthaigram**			250.9/145	45-51, 61-76, 78-97 113-119, 136-142	55	1.12	95.4	26.5	23.2	64.6	627	11.4	-	EW
7.	**Panisagar**		2005	198/154	84-99, 105-135, 142-148	51	16.93	27.66	7.68	6.73	68.61	507.4	9.95	-	EW
8.	**Panisagar BSF** N lat 23^{0}16'30" E long 92^0 09'30"		1977	198/171	83-89, 100-134 143-149, 162-168	51	23.86	65.98	18.33	41.73	25.98	50.06	0.91	-	Deposit well
Kanchanpur Valley															
9	Kanchanpur N lat 24^{0}03'24" E long 92^0 12'04"			92.30/90.50	51-57, 63-72, 75-87	24	4.64	48	13.33	4.84	2.9	234.27			EW & OW

2. Hydrogeological Details of Ground Water Exploration in Unakoti District

Sl. No.	Site name/ Block / Co-ordinates	Surface elevation (m. amsl)	Drilling period	Depth Drilled/ Assembly length(m)	Position of slot (m)	Thickness of aquifer tapped (m)	SWL (m bgl)	Discharge		Draw Down (m)	Specific capacity (lpm/ mdd)	Transm-issivity (m^2/day)	Perme-ability (m/day)	Stora-tivity	Remark
								m^3/hr	lps						
Dharmanagar Valley & Manu-Deo Basin (Unakoti District)															
1	**Pecharthal** N lat 24^{0}11'16" E long 92^{0}06'07"	(29.44) **Toposheet No. 83 D/4**	1981	292.9/ 199.8	112-115, 144-159 174-198	42	2.85 agl	14.9	4.16	29.50	8.46	4.5	0.1	-	Auto Flow, EW
2	**Machmara** N lat 24^{0}08'19" E long 92^{0}07'06"	(33.26) **Toposheet No. 83 D/4**	1983	300.30/ 184	116-125, 128-137 140-149, 154-166 175-181	45	0.70	91	25.29	18.44	82.3	222	5.8	$4.2*10^{-4}$	EW
3	**Machmara** N lat 24^{0}08'19" E long 92^{0}07'06"	(33.41) **Toposheet No. 83 D/4**	1983	208/ 182	120-123, 132-135, 144-147, 157-163,177-179	18	1.48			5.66		200	4.4	$6.8*10^{-3}$	OW
Kailasahar Valley & Manu Deo Basin (Unakoti District)															
3	**South Irani**	(25.42)	1981	300	Abandoned due to lack of granular zone										Slim Hole
4	**Gaurnagar** N lat 24^{0}17'21" E long 92^{0}02'03"	**Toposheet No. 83 D/3**	1982	300/255	88-94, 118-124, 136-142, 172-184, 205-208 223-229, 250-262	51	1.82	90.4	25.11	6.7	225.9	1212.9	23.7	-	Auto Flow, EW
5	**Kumarghat** N lat 24^{0}08'00" E long 92^{0}03'00"	(36.31) **Toposheet No. 83 D/4**	1983	250/159	54-72, 75-87, 92-101, 104-111, 144-150, 150-156	55	1.66	85	23.65	25.75	55.1	189	3.5	2.2×10^{-3}	EW & OW
Kanchanpur Valley (Unakoti District)															
6	**Karaicherra**		2016	116.6	Abandoned due to lack of granular zone										EW

3. Hydrogeological Details of Ground Water Exploration in Dhalai district

Sl. No.	Site name/ Block / Co-ordinates	Surface elevation (m. amsl)	Drilling period	Depth Drilled/ Assembly lowered (m)	Position of slot (m)	Thickness of aquifer tapped (m)	SWL (m bgl)	Discharge		Draw Down (m)	Specific capacity (lpm/ mdd)	Transm-issivity (m^2/day)	Perme-ability (m/day)	Stora-tivity	Remark
								m^3/hr	lps						
Kamalpur Valley & Dhalai Basin															
1.	**Durai SibBari EW** N lat 24⁰06/40″ E long 91⁰49/30//	**Toposheet No. 78 P/16**	1979	251.5/ --	Abandoned due to lack of granular zones										
2.	**Kamalpur EW** N lat 24⁰ 12/ 00// E long 91⁰ 50/ 00//	(30.97) **Toposheet No. 78 P/16**	1977	250/ --	Abandoned due to lack of granular zones										
3.	**Santir bazar EW**	**Toposheet No. 79 M/13**		265/ --	Abandoned due to lack of granular zones										
4.	**Abhanga** N lat 24⁰03/05// E long 91⁰50/20//	**Toposheet No. 78 P/16**	1979	240/231	64–67, 179-188 191-194, 200-203 206-218, 222-228	36	5.70 agl	129.7	36.02	28.14	76.8	1462.1	40.4	$2.85x10^{-4}$	Autoflow EW & OW
5.	**Bhatkhowri** N lat 23⁰59/50// E long 91⁰50/10//	(57.745) **Toposheet No. 79 M/13**	1979	305/203	60-66, 98-114 120-123, 132-138 147-154, 194-200	44	2.48	167.4	46.50	14.73	189.8	1186.6	26.9	-	EW
6.	**Kulai** N lat 23⁰56/54// E long 91⁰49/39//	**Toposheet No. 79 M/13**	2018	150/111	36-42, 75-84, 99-108	27	3.25	82.8	23	0.58					EW
Kailasahar Valley & Manu Deo Basin															
7.	**Karamcherra** N lat 24⁰02/30// E long 92⁰00/30//	(38.036) **Toposheet No. 83 D/4**	1980	294/175	52-65, 71-83 89-104, 125-130 149-155, 167-173	57	0.42	210.5	58.48	20.88	168	603	10.35	-	EW
8.	**Tilokpara** N lat 23⁰56/00// E long 92⁰02/00//	(51.250) **Toposheet No. 84 A/1**	1980	300/221	54-60, 72-75 96-111, 120-138 176-179, 200-203 212-218	54	2.37	90.0	25.00	18.22	83.08	225	4.2	$5.89x10^{-4}$	EW & OW
9.	**Chhawmanu** N lat 23⁰50/49″ E long 91⁰59/43//	(70.54) **Toposheet No. 79 M/13**	1981	300/259.5	126-131, 134-146 148-152, 156-158, 221-229, 233-242, 246-255	50	1.74 agl	37.9	10.52	38.36	16.47	26.4	0.52	-	Autoflow EW

4. Hydrogeological Details of Ground Water Exploration in Khowai District

Sl. No.	Site name/ Block / Co-ordinates	Surface elevation (m. amsl)	Drilling period	Depth Drilled/ Assembly length(m)	Position of slot (m)	Thickness of aquifer tapped (m)	SWL (m bgl)	Discharge		Draw Down (m)	Specific capacity (lpm/ mdd)	Transm-issivity (m^2/day)	Perme-ability (m/day)	Stora-tivity	Remark
								m^3/hr	lps						
Khowai Valley & Khowai Basin (Khowai District)															
1.	**Bonbazar**			256	52-61, 85-100	24	Flowing	-	-	NA	-	-	-	-	EW, Sand flow
2.	**Asharambari** N lat 24^{0}09'40" E long 91^{0}42'42"	31.515	1980	301/170	51-62, 107-112 120-146, 155-167	54	0.5agl	28	7.65	10.45	44.6	-	-	-	Autoflow EW & OW
3.	**Badlabari**			250/225	60-78, 84-96 120-126, 162-180 216-222	60	0.80	-	-	NA	-	-	-	-	EW
4.	**Khowai** N lat 24^{0}03'45" E long 91^{0}36'30"	25.4	1976	295/257	132-137, 153-188 236-255	59	7.68 magl	79.2	22	13.6	207	1689	28.4	-	Autoflow EW
5.	**Baijalbari** N lat 24^{0}02'00" E long 91^{0}33'10"	35.5	1978	256.7/ 231	76-80, 88-92 110-134, 168-180 195-208, 217-229	71	10.41	74	20.56	5.68	217	1102	15.52	-	EW
6.	**Balucherra** N lat 23^{0}51'15" E long 91^{0}38'20"		1979	302/240	56-70, 75-79 92-107, 126-141 205-217, 231-237	66	6.41	91	22.52	6.83	197	1047	15.9	-	EW
7	**Chakmaghat** N lat 23^{0}50'05" E long 91^{0}40'33"	54	2017	128/102	40-49 60-69 90-99	27	3.5	15.84	4.4	5.3					(EW +OW)
8	**Kalyanpur (Totabari)** N lat 23.909 E long 91.620	52	2018	150/112	52-58 60-69 81-90	24	15.6	71.6	21	10.15					(EW+OW)

5. Hydrogeological Details of Ground Water Exploration in West Tripura District

Sl. No.	Site name/ Block / Co-ordinates	Surface elevation (m. amsl)	Drilling period	Depth Drilled/ Assembly length(m)	Position of slot (m)	Thickness of aquifer tapped (m)	SWL (m bgl)	Discharge		Draw Down (m)	Specific capacity (lpm/ mdd)	Transm-issivity (m^2/day)	Perme-ability (m/day)	Stora-tivity	Remark
								m^3/hr	lps						
Agartala Valley & Haora Basin (West Tripura District)															
1.	**Jirania BDO office**			254.8/198	50-73, 105-115 127-136, 185-195 230-245	64	1.47	10.08	2.80	14.97	123.5	1100	17.0	-	EW
2.	**Belbari** N lat 23^{0}46'00" E long 91^{0}29'30"	24.59m	1985	257/250	57-72, 87-96 154-166, 178-191 236-247	60	2.78	34.78	9.66	30.53	19.4	617	2.93	$7.5x10^{-4}$	EW & OW
3.	**Jirania Coco Firm** N lat 23^{0}51'19" E long 91^{0}26'01"		1986	232/174	86-92, 110-122 134-146, 152-171	48	9.30	63.8	17.72	5.05	210	892	18.43	-	Deposit well
4.	**Champaknagar**			261.3/191	41-52, 124-136 147-188	64	NA	0.78	0.22	20.92	10.3	-	-	-	EW
5.	**Sasubari** N lat 23^{0}55'30" E long 91^{0}27'30"			281/182	98-110, 116-122 128-143, 153-162 165-179	56.9	-	-	-	-	-	-	-	-	EW yet to be tested
6.	**Salbagan BSF** N lat 23^{0}53'27" E long 91^{0}17'29"		1979	203.2/ 163	64-68, 72-81 94-100, 120-134 144-150, 156-160	41	13.90	42.40	11.78	17.26	40.94	933	22.76	-	Deposit well
7.	**Salbagan BSF** N lat 23^{0}53'27" E long 91^{0}17'29"		2004	200.8/ 183	71-98, 171-180	36	2.4	7.20	2	15.57	13.37			-	EW & OW
8.	**GPA Agartala** N lat 23^{0}07'45" E long 91^{0}38'10"		1980	190/187	60-84, 90-96 140-146, 166-184	54	9.81	164.87	45.79	12.63	217.43	1449	26.8	-	Deposit well
9.	**Fatikcherra BSF** N lat 23^{0}57'28" E long 91^{0}21'00"		2004	200/172	94-103, 120-126 145-169	39	1.95	50	13.88	8.92	98.02	934.43	23.96	$2.06x10^{-3}$	EW & OW
10.	**Vivekananda nagar**			255/155	43-89, 95-98 105-111	55	NA	3.96	1.10	0.5	104.7	161.4	2.4	-	EW
Agartala Valley & Haora Basin (West Tripura District)															
11.	**Suryamaninagar (Tripura University)**		2004	200.60/ 183	96-102, 104-122 145-154, 174-180	39	6.45	46.55	12.93	4.67	177.37	986.74	25.30	-	EW & OW

	N lat 23^{0}46’30” E long 91^{0}16’00”														
12.	**Badharghat** N lat 23^{0}48’28” E long 91^{0}16’02”		2005	200.60/ 193	140-155, 157-167 180-190	35	3.06	61.16	16.98	17.46	58.36	735.1	21	-	EW & OW
13.	**Lichubagan** N lat 23^{0}52’30” E long 91^{0}17’15”		2006	197.45/ 179	114-120, 132-144 164-176	30	5.70	28.85	8.01	5.76	83.47	453.64	15.12	-	EW & OW
14.	**Narsingarh** N lat 23^{0}54’08” E long 91^{0}15’22”		2006	200.55/ 186	113-119, 143-149 154-169, 180-183	30	10.69	37.24	10.34	3.22	186.97	1225.31	40.85	-	EW & OW
15.	**Bodhjungnagar** N lat 23^{0}56’26” E long 91^{0}20’30”		2006	200.45/ 187	154-160, 166-184	24	20.92	6.07	1.65	4.46	22.65	86.67	3.62	-	EW & OW
16.	**Nagicherra** N lat 23^{0}48’40” E Pz 91^{0}90’21”		2007	197/181	119-125, 131-137 160-178	30	No pumping test due to low discharge and heavy draw down								EW & OW
17.	**Arundhatinagar P&T Colony, Agartala**		1982	226.6/200	66-68, 72-78,89-92, 110-116, 136- 148,154-160,164- 170, 174-177, 190- 196	51	4.65	70.68	19.63	7.62	160	6859	134.5		Deposit well

6. Hydrogeological Details of Ground Water Exploration in Sipahijala District

Sl. No.	Site name/ Block / Co-ordinates	Surface elevation (m. amsl)	Drilling period	Depth Drilled/ Assembly length(m)	Position of slot (m)	Thickness of aquifer tapped (m)	SWL (m bgl)	Discharge		Draw Down (m)	Specific capacity (lpm/ mdd)	Transm-issivity (m^2/day)	Perme-ability (m/day)	Stora-tivity	Remark
								m^3/hr	lps						
Agartala - Sonamura Valley & Burigang Basin (Sipahijala District)															
1	**Bishalgarh**			235/95	47-92	45	NA	10.32	2.87	13.65	210.0	1438	28.3	$1.28x10^{-4}$	EW
2	**Jampuijala** N lat 23°42'30" E long 91°27'55"			205/180	69-80, 98-110 116-128, 140-153 171-177	53	0.05	62.8	17.4	4.95	211.7	709	11.8	-	EW
3	**Golaghati** N lat 23°48'45" E long 91°21'30"	28.045	1985	270/170	65-77, 88-100 119-125, 131-137 156-168	48	1.46	20.70	5.75	10.74	32.1	90.9	1.83	$4.4x10^{-4}$	EW & OW
4	**Gokulnagar BSF** N lat 23°42'10" E long 91°16'40"		2003	200/163	57-61, 69-73, 82-91 109-111, 115-119, 125-127, 145-160	40	11.14	35	9.84	6.03	98.33	1302	32.92	$2.06x10^{-3}$	EW & OW
5	**Gokulnagar** N lat 23°42'53" E long 91°16'56"		1976	204/175	63-70, 99-109 118-128, 134-173	66	7.86	113	31.41	27.94		904.8	13.7	-	Deposit well
6.	**Konaban** N lat 24°42'20" E long 91°12'45"	39.455	1986	200.6	-	-	-	-	--	-	-	-	-	-	Slim Hole

7. Hydrogeological Details of Ground Water Exploration in Gomti District

Sl. No.	Site name/ Block / Co-ordinates	Surface elevation (m. amsl)	Drilling period	Depth Drilled/ Assembly length(m)	Position of slot (m)	Thickness of aquifer tapped (m)	SWL (m bgl)	Discharge		Draw Down (m)	Specific capacity (lpm/ mdd)	Transm-issivity (m^2/day)	Perme-ability (m/day)	Stora-tivity	Remark
								m^3/hr	lps						
Amarpur Valley & Gomti Basin (Gomti District) block - Amarpur															
1.	**Amarpur** N lat 23^{0}31'20" E long 91^{0}39'38"		1975	255/178	35-42, 72-83 92-115, 125-140 153-176	76	9.93	158	44	9.08	133.6	794.7	10.43	-	EW
2.	**Ompinagar** N lat 23^{0}40'27" E long 91^{0}38'16"		1976	250/153	55-73, 111-130 140-150	47	0.7	158	44	24.3	181.0	362	7.1	1.77x10^{-3}	EW & OW
3.	**Nutan Bazar**			250/60	30-56	27	2.53	12	3.33	8.5	23.5	-	-	-	EW
4.	**Rangkhang**			190/181	47-56, 65-88 108-114, 144-147 156-168, 172-178	39	10.4	85.1	23.63	10.6	134.0	329.0	8.4	-	Deposit well
5.	**Duluma**			208/158	63-75, 86-98 12-121, 142-151	42	10.5	96.5	26.80	14.4	112.0	325.2	7.76	-	Deposit well
Udaipur-Sabroom Valley & Gomti Basin (Gomti District) block- Matabari															
6.	**Bagma**			201/162	64-70, 115-133	36	4.5	48.6	13.5	20.3	30.8	330	9	-	EW
7.	**Tulamura** N lat 23^{0}27'35" E long 91^{0}27'10"	(18.925)	1979	247/212.6	75-81, 85-91 99-111, 179-191 197-210	48	1.0 magl	112	31.21	24.0	78	246	5.1	-	EW Auto flow
8.	**Dhupthali** N lat 23^{0}13'25" E long 91^{0}23'20"	(19.675)	1990	208/ 132	56-80, 92-104 110-128	54	1.50 magl	36	10	6.80	88	263	4.8	-	EW & OW Auto flow

8. Hydrogeological Details of Ground Water Exploration in South Tripura District

Sl. No.	Site name/ Block / Co-ordinates	Surface elevation (m. amsl)	Drilling period	Depth Drilled/ Assembly length(m)	Position of slot (m)	Thickness of aquifer tapped (m)	SWL (m bgl)	Discharge		Draw Down (m)	Specific capacity (lpm/ mdd)	Transm-issivity (m^2/day)	Perme-ability (m/day)	Stora-tivity	Remark
								m^3/hr	lps						
Udaipur-Sabroom Valley & Muhuri Basin (South Tripura District)															
1	**Rajapur** Block - Rajnagar N lat 23^{0}20'45" E long 91^{0}29'15"	(13.16)	1979	252/215	50-53, 56-59, 65-70 75-86, 119-126 150-155, 162-165 169-174, 197-212	56	5.30	143	39.72	10.30	232	1577	27.4	-	EW
2	**Rajnagar** N lat 23^{0}40'27" E long 91^{0}38'16"	(13.16)	1979	252/186	51-93, 113-125 136-148, 157-163 171-183	54	2 magl	151	42.08	25.0	101	222	4.1	-	EW & OW Auto flow
3	**Matai** Block - Rajnagar			232/200	64-82, 140-152 161-173, 183-195	54	3.6	12	3.33	17.6	11.4	47.4	0.87	$2.2x\ 10^{-4}$	EW
4	**Manubazar** N lat 23^0 04' 34" E long 91^0 38' 35"	Blk-Satchand **Toposheet No. 79 M/12**		233/208	87-106, 117-120 162-168, 193-205	40	19.95	79.5	22.08	5.4	24.5	897	22.4	-	Deposit well
Udaipur-Sabroom Valley & Muhuri Basin (South Tripura District)															
5	**Ghoshkhamar** Block - Rajnagar			220/206	52-58, 79-97 130-142, 154-166 186-192, 197-203	60	1.48	12	3.33	11.3	17.7	164	2.70	-	EW
6	**Bagafa BSF** N lat 23^{0}20'03" E long 91^{0}35'03"		2004	197.5/ 167	103-106, 109-114 116-119, 123-131 138-150, 158-164	37	20.92	36.79	10.21	12.21	50.22	752.45	20.34	-	EW
Udaipur-Sabroom Valley & Fenni Basin (South Tripura District)															
7	**Haripur** Rajnagar block	(25.972)	1991	202/187	80-92, 104-110 144-150, 160-184	48	1.9	30	8.33	7.12	70.2	330	4.8	$2.38x10^{-3}$	EW & OW
8	**Satchand** N lat 23^{0}07'45" E long 91^{0}38'10"	(17.465) **Toposheet No.79 M/12**	1979	253/200	60-63, 83-88, 93-99 117-120, 130-133, 147-153, 168-180, 183-189, 192-198	50	0.42 magl	91	25.25	12.47	121.2	887.7	17.75	-	EW Auto flow
Udaipur-Sabroom Valley & Muhuri Basin (South Tripura District)															
9	**Ghoshkhamar** Block - Rajnagar			220/206	52-58, 79-97 130-142, 154-166 186-192, 197-203	60	1.48	12	3.33	11.3	17.7	164	2.70	-	EW Auto flow
10	**Bagafa BSF**		2004	197.5/	103-106, 109-114	37	20.92	36.79	10.21	12.21	42.76	752.45	20.34	-	EW

	N lat 23^{0}20’03” E long 91^{0}35’03”			167	116-119, 123-131 138-150, 158-164										
Udaipur-Sabroom Valley & Fenni Basin (South Tripura District)															
11	**Tuisama EW** N 23.156692 E 91.66163		2015	174.5/154	74–80, 86 – 92, 98 – 104	18	16.06	13.212		2.93					EW
12	**Tuisama OW** N 23.156692 E 91.66163		2015	174.5/154	74 – 80, 86 – 92, 98 – 104,130 –139, 48–151	30	12.67	14.4		2.72					OW
13	**Paschim Jalefa EW** N 23.0331692 E 91.6873053		2015	175.5/151	77– 83, 89 – 101, 113–119, 142–148	30		18.432		0.99					Autoflow EW
14	**Paschim Jalefa OW** N 23.0331692 E 91.6873053		2015	158.60/151	77-83, 92-98, 113-119, 142-148	24		16.488		0.72					Autoflow OW
15	**Rajib Nagar Block-Satchand** N lat 23^{0}03’25” E long 91^{0}39’23”	25m 79 M/12 & 3B	2015-16	160/153	75-81; 105-117; 123-135; 141-150	39	8.94	72	20	0.75	1066	1783.08		3.80x10^{-4}	EW
16	**Rajib Nagar Block-Satchand** N lat 23^{0}03’25” E long 91^{0}39’23”	79 M/12 & 3B	2016	160/152	71-77, 89-95, 104-110, 122-128, 143-149	30	7.83	16.236		0.73					OW

RESULTS OF PUMPING TEST ON EXPLORATORY WELLS AND OBSERVATION WELLS CONSTRUCTED BY CGWB

District – NORTH TRIPURA																
Sl No	Village	Type of Well	Type of Test	Date	SWL (m bgl)	Step /Duration in min	Discharge in lps	Draw down (m)	Specific Cap lpm/m	Sp.Drawdown m/m3/min	Formation loss (m)	Well loss (m)	Well Effeciency	Caliculated Drawdown m	Transmissivity m2/day	Perme ability m/day	Stora tivity
1.	Panisagar BSF (2005)	EW	SDT	09.9.05	16.93	1- 60	6.3	5.8	65.8	15.17	5.15	0.63	89	-	-	-	-
						2- 60	7.7	7.6	61.2	16.34	6.24	0.93	87	-	-	-	-
						3- 60	8.8	8.7	60.9	16.42	7.15	1.24	85	-	-	-	-
						4- 60	9.9	9.6	62.2	16.1	8.02	1.55	83	-	-	-	-
			APT	10.9.05	16.93	650	7.7	6.7	-	-	-	-		-	507	9.95	
2.	Panisagar BSF (1977)	EW	SDT	28.11.77	23.49	1-130	11.6	26.8	-	38.54	20.15	5.79	-	25.94	-	-	-
						2- 60	13.8	31.2	-	37.81	23.92	8.16	-	32.08	-	-	-
						3- 60	14.7	34.9	-	39.65	25.52	9.28	-	34.74	-	-	-
						4- 75	16.9	39.4	-	38.77	29.46	12.38	-	41.82	-	-	-
						5- 75	18.3	42.3	-	38.45	31.9	14.52	-	46.45	-	-	-
			APT	01.12.77	23.86	480	18.3	41.7	25.98	-	-	-		-	50	0.91	-

District – UNAKOTI																	
Sl No	Village	Type of Well	Type of Test	Date	SWL (m bgl)	Step /Duration in min	Discharge in lps	Draw down (m)	Specific Cap lpm/m	Sp.Drawdown m/m3/min	Formation loss (m)	Well loss (m)	Well Effeciency	Caliculated Drawdown m	Transmissivity m2/day	Perme ability m/day	Stora tivity
1	Pechartal	EW	SDT	15.12.81	2.85 m agl	1- 60	3.5	22.5	9.4	106.27	22.02	0.89	96	-	-	-	-
						2- 60	3.9	26.1	9.0	111.00	24.41	1.10	95	-	-	-	-
						3- 60	4.2	28.5	8.8	114.00	25.97	1.25	95	-	-	-	-
			APT	16.12.81	2.85 m agl	500	4.2	29.5	8.5	-	-	-		-	4.5	0.1	-
2	Kumarghat	EW	SDT	14.7.83	1.64	1- 60	16.0	15.3	-	-	-	-	-	-	-	-	-
						2- 60	20.1	18.9	-	-	-	-	-	-	-	-	-
						3- 60	23.7	24.6	-	-	-	-	-	-	-	-	-
						4- 60	26.8	27.5	-	-	-	-	-	-	-	-	-
			APT	16.7.83	1.58	1440	23.7	25.7	290.0	-	-	-		-	346	7.2	2.2×10^{-3}
		OW		16.7.83				4.9									
3	Machmara	EW	SDT	22.4.83	0.62	1-60	15.8	9.4	100	9.95	9.85	0.72	93	-	-	-	-
						2-60	20.0	12.8	93	10.67	12.46	0.92	93	-	-	-	-

						3-60	23.7	15.4	92	10.87	14.75	1.09	93	-	-	-	-
						4-60	26.8	17.6	92	10.91	16.72	1.24	93	-	-	-	-
						5-60	29.3	19.3	91	10.98	18.3	1.35	93	-	-	-	-
			APT	24.4.83	0.61	1320	25.3	18.4	82.28	-	-	-		-	222	5.8	-

District - DHALAI																	
Sl. No	**Village**	**Type of Well**	**Type of Test**	**Date**	**SWL (m bgl)**	**Step - Duration in min**	**Discharge (lps)**	**Draw down (m)**	**Specific Capacity lpm/m**	**Sp. Drawdown (m/m^3/min)**	**Formation loss (m)**	**Well loss (m)**	**Well Effeciency**	**Calculated Drawdown (m)**	**Transmissivity (m^2/day)**	**Perme ability (m/day)**	**Stora tivity**
1.	**Abhanga**	EW	SDT	07.6.79	5.7	1- 90	27.1	16.7	97.4	10.27	14.22	3.3	-	17.52	-	-	-
						2- 90	31.2	20.6	91.2	10.97	16.38	4.38	-	20.76	-	-	-
						3- 90	34.6	23.5	88.3	11.32	18.14	5.37	-	23.51	-	-	-
						4- 90	36.8	26.0	84.9	11.77	19.33	6.1	-	25.43	-	-	-
						5- 90	39.1	29.0	80.8	12.37	20.52	6.87	-	27.39	-	-	-
			APT	08.6.79	5.7	600	36.0	28.1	76.8	-	-	-	-	-	1425	40.4	2.85 x 10^{-4}
		OW			5.7		-	1.4	-	-	-	-	-	-	-	-	-
2.	**Bhat-khowri**	EW	SDT	03.7.79	2.5	1- 120	34.5	11.0	189.2	5.28	0.93	9.94	-	10.87	-	-	-
						2- 120	42.1	13.9	181.5	5.51	1.14	12.12	-	13.26	-	-	-
						3- 120	52.2	17.7	176.9	5.65	1.4	15.02	-	16.42	-	-	-
			APT	07.7.79	2.5	510	46.5	14.7	189.8	-	-	-	-	-	1187	26.9	-
3.	**Karam-cherra**	EW	SDT	25.4.80	0.4	1- 60	31.2	9.6	195.0	5.13	8.38	1.23	-	9.61	-	-	-
						2- 60	43.7	14.4	182.0	5.49	11.72	2.40	-	14.12	-	-	-
						3- 60	53.9	18.2	178.0	5.60	14.48	3.66	-	18.14	-	-	-
						4- 60	63.2	21.2	178.0	5.59	16.97	5.03	-	22.00	-	-	-
			APT	26.4.80	0.4	960	58.5	20.9	168.0	-	-	-	-	-	603.0	10.4	-
4.	**Tilakpara**	EW	SDT	28.2.79	2.4	1- 60	15.8	9.5	100.1	9.98	7.79	1.34	-	9.13	-	-	-
						2- 60	21.8	13.9	94.1	10.63	11.07	2.57	-	13.64	-	-	-
						3- 60	26.8	17.8	90.2	11.08	13.59	3.88	-	17.47	-	-	-
						4- 60	30.8	20.8	88.9	11.25	15.64	5.14	-	20.78	-	-	-
			APT	25.5.79	2.4	1440	25.2	18.2	83.1	-	-	-	-	-	225.0	4.0	
		OW			2.4		24.1	5.1	-	-	-	-	-	-	229.3	-	6.3 x10^{-4}
5.	**Chha-manu**	EW	SDT	12.5.81	1.7 m agl	1- 60	6.6	19.6	20.1	49.87	17.87	1.74	91	19.60	-	-	-
						2- 60	9.3	28.9	19.4	51.63	25.42	3.51	87	28.94	-	-	-
						3- 60	11.5	36.9	18.8	53.31	31.44	5.37	85	36.81	-	-	-
						4- 60	13.2	36.9	21.5	46.47	30.04	7.08	80	37.12	-	-	-
			APT	13.5.81	1.74 m agl	480	10.5	38.1	16.5	-	-	-	-	-	26.4	0.52	-

District - KHOWAI																
Sl. No.	Village	Type of Well	Type of Test	Date	SWL (m bgl)	Step - Duration (min)	Discharge (lps)	Drawdown (m)	Specific Capacity (lpm/m)	Sp. Drawdown (m/m^3/min)	Formation loss (m)	Well loss (m)	Well effeciency (%)	Calculated Drawdown (m)	Transmissivity (m2/day)	Perme ability (m/day)	Stora tivity
1	Balu-cherra	EW	SDT	01.8.79	6.41	1- 90	15.77	4.30	220.0	4.55	3.5	0.85	-	4.35	-	-	-
						2- 90	17.97	5.17	208.0	4.8	3.98	1.11	-	5.1	-	-	-
						3- 90	20.75	6.04	206.0	4.85	4.6	1.48	-	6.09	-	-	-
						4- 90	22.52	6.66	202.0	4.93	4.99	1.75	-	6.75	-	-	-
						5- 90	23.98	7.21	199.0	5.01	5.32	1.98	-	7.3	-	-	-
			APT	03.8.79	6.41	900	22.52	6.83	197.0	-	-	-		-	1047	15.9	-
2	Khowai	EW	SDT-1	02.7.76	7.00 m agl	1- 70	21.82	6.90	189.0	-	-	-	-	-	-	-	-
						2-150	26.73	8.14	197.0	-	-	-	-	-	-	-	-
						3-120	31.30	9.67	194.0	-	-	-	-	-	-	-	-
						4-100	36.10	10.44	207.0	-	-	-	-	-	-	-	-
			SDT-2	08.10.77	7.66 m agl	1-30	6.28	1.59	62.0	-	-	-	-	-	-	-	-
						2-20	8.80	2.66	105.0	-	-	-	-	-	-	-	-
						3-30	11.00	2.71	133.0	-	-	-	-	-	-	-	-
						4-30	12.93	3.66	194.0	-	-	-	-	-	-	-	-
						5-30	14.67	4.21	255.0	-	-	-	-	-	-	-	-
			APT	09.10.77	7.68 m agl	795	22.00	-	-	-	-	-	-	-	1689	28.4	-

District – WEST TRIPURA																
Sl. No.	Village	Type of Well	Type of Test	Date	SWL (m bgl)	Step / Duration (min)	Discharge (lps)	Drawdown (m)	Specific Cap (lpm/m)	Sp.Drawdown (m/m^3/min)	Formation loss (m)	Well loss (m)	Well effeciency (%)	Caliculated Drawdown (m)	Transmissivity (m2/day)	Perme ability (m/day)	Stora tivity
1.	Arundhu-tinagar	EW	SDT	27.1.82	4.66	1-60	14.92	5.21	90.8	11.02	5.37	0.34	94	5.71	-	-	-
						2-60	19.62	7.35	160.7	6.24	7.06	0.59	93	7.66	-	-	-
						3-60	23.46	9.13	154.2	6.48	8.44	0.85	90	9.29	-	-	-
			APT	29.1.82	4.65	360	19.63	7.62	160.0	-	-	-		-	6860	134	
2.	Fatik-cherra	EW	SDT	17.11.04	1.95	1-60	7.25	4.27	101.9	9.81	4.13	0.42	91	-	-	-	-

						2-60	9.90	6.00	99.0	10.10	5.60	0.79	88	-	-	-	-
						3-60	12.11	7.60	95.6	10.45	6.91	1.19	85	-	-	-	-
						4-60	14.00	8.80	95.5	10.48	7.98	1.59	83	-	-		-
			APT	11.11.04	1.95	1000	14.00	8.93	-	-	-	-		-	922	24	-
3.	**Badhar-ghat**	EW	SDT	29.3.05	6.45	1-60	6.81	6.00	68.1	14.67	6.42	1.39	82	-	-	-	-
						2-60	9.21	9.84	56.2	17.79	8.68	2.55	77	-	-	-	-
						3-60	11.23	12.67	53.2	18.80	10.58	3.78	74	-	-	-	-
						4-60	12.93	15.24	50.9	19.64	12.18	5.02	71	-	-	-	-
			APT	30.3.05	0.43	1000	16.98	17.46		-	-	-		-	735.0	21.0	-
4.	**Suryama-ninagar**	EW	SDT	03.02.05	6.45	1-60	6.81	1.91	214.0	4.67	1.55	0.43	78		-	-	-
						2-60	9.21	2.88	192.0	5.21	2.1	0.78	73		-	-	-
						3-60	11.23	3.77	179.0	5.59	2.56	1.16	69		-	-	-
						4-60	12.93	4.57	170.0	5.89	2.94	1.54	66		-	-	-
			APT	04.2.05	6.45	1000	12.93	4.67	-	-	-	-		-	986.0	25.3	-
5.	**Bodhju-ngnagar**	EW	SDT	06.4.07	20.90	1-60	0.98	2.60	22.7	43.33	2.13	0.46	82	-	-	-	-
						2-60	1.60	3.83	25.1	38.3	3.55	1.27	74	-	-	-	-
						3-60	1.92	6.07	19.0	50.58	4.26	1.82	70	-	-	-	-
			APT	07.4.07	20.92	500	1.68	4.46	22.7	-	-	-		-	86.67	3.62	-
6.	**Lichu-bagan**	EW	SDT	25.2.07	5.73	1-60	4.11	2.20	112.0	8.91	1.31	0.84	61	-	-	-	-
						2-60	5.81	3.61	97.0	10.34	1.85	1.68	52	-	-	-	-
						3-60	7.27	4.59	95.0	10.56	2.31	2.63	47	-	-	-	-
						4-60	8.06	5.74	84.0	11.88	2.56	3.22	44	-	-	-	-
			APT	26.2.07	5.70	600	8.01	5.76	83.5	-	-	-		-	454	15.1	-
7.	**Narsin-garh**	EW	SDT	17.3.07	10.71	1-60	6.32	1.44	263.0	3.79	1.25	0.67	65	-	-	-	-
						2-60	8.07	2.01	241.0	4.19	1.58	1.07	60	-	-	-	-
						3-60	9.53	2.60	220.0	4.56	1.88	1.51	55	-	-	-	-
						4-60	11.23	3.26	207.0	4.87	2.21	2.08	52	-	-	-	-
			APT	18.3.07	10.69	600	10.35	3.32	187.0	-	-	-		-	1225	40.85	-
8.	**Baijalbari**	EW	SDT	19.7.79	10.48	1- 90	12.92	3.08	366.0	3.97	2.48	0.56	-	-	-	-	-
						2- 90	16.50	4.14	314.0	4.14	3.19	0.92	-	-	-	-	-
						3- 90	18.85	4.83	292.0	4.27	3.61	1.19	-	-	-	-	-

						4- 90	20.75	5.49	227.0	4.41	3.98	1.44	-	-	-	-	-
			APT	21.7.79	10.45	1080	20.56	5.68	217.0	-	-	-		-	1102	15.5	-
9.	**Jirania Coconut Seed Farm**	EW	SDT	04.5.86	9.30	1- 60	13.63	3.36	243.0	4.1	1.93	1.39	55	-	-	-	-
						2- 60	15.08	3.84	236.0	4.24	2.13	1.71	56	-	-	-	-
						3- 60	16.59	4.43	225.0	4.44	2.35	2.07	53	-	-	-	-
						4- 60	17.92	4.98	216.0	4.63	2.53	2.41	51	-	-	-	-
			APT	06.5.86	9.30	500	17.72	5.05	210.0	-	-	-		-	892	18.43	-
10.	**Belbari**	EW	SDT	10.3.85	2.78	1- 60	5.93	13.20	27.0	37	8.90	4.12	68	-	-	-	-
						2- 60	8.33	20.50	24.0	41	12.50	8.13	61	-	-	-	-
						3- 60	10.35	28.30	22.0	45.57	15.53	12.53	56	-	-	-	-
			APT	14.3.85	2.77	855	14.30	30.33	187.0	-	-	-		-	590	3.33	7.07 x10^{-4}
11.	**GPA Agartala**	EW	SDT	28.7.80	9.85	1- 60	30.28	7.37	246.0	4.05	7.44	0.27	96	-	-	-	-
						2- 60	38.35	9.85	233.0	4.28	9.43	0.44	95	-	-	-	-
						3- 60	45.80	11.77	233.0	4.28	11.26	0.63	94	-	-	-	-
						4- 60	52.23	13.64	229.0	4.35	12.84	0.82	94	-	-	-	-
			APT	30.7.80	9.81	480	45.79	12.63	217.0	-	-	-		-	1449	26.83	-
12.	**Salbagan**	EW	SDT	24.8.79	14.20	1- 90	8.38	11.93	42.5	23.57	10.89	0.75	-	11.64	-	-	-
						2- 170	10.21	14.75	41.5	24.1	13.28	1.12	-	14.4	-	-	-
						3- 130	11.78	15.84	44.6	22.49	15.32	1.49	-	16.81	-	-	-
						4- 100	12.92	19.03	40.7	24.55	16.79	1.79	-	18.59	-	-	-
			APT	26.8.79	1.90	480	11.78	17.26	40.9	-	-	-		-	933	22.8	-
						2- 90	17.97	5.17	208.0	4.8	3.98	1.11	-	5.1	-	-	-
						3- 90	20.75	6.04	206.0	4.85	4.6	1.48	-	6.09	-	-	-
						4- 90	22.52	6.66	202.0	4.93	4.99	1.75	-	6.75	-	-	-
						5- 90	23.98	7.21	199.0	5.01	5.32	1.98	-	7.3	-	-	-
			APT	03.8.79	6.41	900	22.52	6.83	197.0	-	-	-		-	1047	15.9	-

District – SEPAHIJALA															
Sl. No.	Village	Type of Well	Type of Test	Date	SWL (m bgl)	Step - Duration (min)	Discharge (lps)	Drawdown (m)	Specific Capacity (lpm/m)	Sp. Drawdown (m/m^3/min)	Formation loss (m)	Well loss (m)	Well effeciency (%)	Calculated Drawdown (m)	Transmissivity (m2/day)	Perme ability (m/day)	Stora tivity
1	Gokul-nagar	EW	SDT	28.3.76	7.86	1-180	16.92	10.17	99.8	-	-	-	-	-	-	-	-
						2-120	24.43	15.83	92.6	-	-	-	-	-	-	-	-
						3-75	31.42	19.41	97.11	-	-	-	-	-	-	-	-
						4-15	36.67	19.96	110.2	-	-	-	-	-	-	-	-
			APT	30.3.76	7.86	390	31.42	19.41		-	-	-	-	-	904	13.71	-

District – GOMATI																
Sl. No.	Village	Type of Well	Type of Test	Date	SWL (m bgl)	Step - Duration (min)	Discharge (lps)	Drawdown (m)	Specific Capacity (lpm/m)	Sp. Drawdown (m/m^3/min)	Formation loss (m)	Well loss (m)	Well effeciency (%)	Calculated Drawdown (m)	Transmissivity (m2/day)	Perme ability (m/day)	Stora tivity
1	Dhuptali	EW	SDT	11.12.91	1.5 magl	1- 50	6.20	3.71	20.05	-	3.03	0.96	76.0	19.6	-	-	-
						2- 50	8.30	5.18	19.37	-	4.06	1.72	70.0	28.9	-	-	-
						3- 50	9.50	6.29	18.76	-	4.65	2.25	67.0	36.8	-	-	-
						4- 50	11.00	7.38	21.52	-	5.39	3.02	64.0	37.1	-	-	-
			APT	12.12.91	1.5 m agl	1200	10.00	6.80	88.0	-	-	-	-	-	259	4.80	4.2 x10^{-4}
		OW			1.36 magl		-	1.72	-	-	-	-	-	-	-	-	-
2	Tulamura	EW	SDT	20.79	1.0 m agl	1-60	24.75	21.53	69.0	14.49	17.52	3.99	-	-	-	-	-
						2- 60	27.08	24.11	67.0	14.83	19.17	4.77	-	-	-	-	-
						3- 60	29.28	26.30	67.0	14.97	20.73	5.58	-	-	-	-	-
						4- 60	31.18	27.67	67.0	14.78	22.07	6.33	-	-	-	-	-
			APT	21.7.79	1.0 m agl	720	31.22	24.09	-	-	-	-	-	-	246	5.10	-
3	Ompi-nagar	EW	SDT	16.5.76	1.42	1- 360	36.60	21.16	103.0	-	-	-	-	-	-	-	-
						2- 240	44.00	23.45	112.0	-	-	-	-	-	-	-	-
						3- 225	73.33	25.73	170.0	-	-	-	-	-	-	-	-
			APT	18.5.76	1.42	2880	44.00	24.50	-	-	-	-	-	-	362	7.09	1.775x10^{-4}
		OW	APT	18.5.77	-	-	-	6.62	-	-	-	-	-	-	-	-	-
4	Amar-pur	EW	SDT	11.4.75	9.93	1- 120	22.00	4.47	295.0	-	-	-	-	-	-	-	-
						2- 120	31.40	6.68	282.0	-	-	-	-	-	-	-	-
						3- 120	44.00	9.03	292.0	-	-	-	-	-	-	-	-

			APT	13.4.75	9.93	300	44.00	9.08		-	-	-	-	-	794.0	10.43	-

District – SOUTH TRIPURA																
Sl. No.	**Village**	**Type of Well**	**Type of Test**	**Date**	**SWL (m bgl)**	**Step - Duration (min)**	**Discharge (lps)**	**Drawdown (m)**	**Specific Capacity (lpm/m)**	**Sp. Drawdown ($m/m^3/min$)**	**Formation loss (m)**	**Well loss (m)**	**Well effeciency (%)**	**Calculated Drawdown (m)**	**Transmissivity (m2/day)**	**Perme ability (m/day)**	**Stora tivity**
1.	**Bagafa**	EW	SDT	13.7.04	20.42	1- 60	6.31	7.80	48.84	20.58	6.44	1.38	82.0	-	-	-	-
						2- 60	8.39	11.36	44.31	22.58	8.55	2.43	77.9	-	-	-	-
						3- 60	10.22	14.34	42.76	23.39	10.42	3.61	74.3	-	-	-	-
						4- 60	11.80	16.87	41.96	23.83	12.04	4.82	71.4	-	-	-	-
			APT	16.7.04	20.90	1000	10.22	12.21	50.22	-	-	-		-	752	20.3	
2.	**Rajapur**	EW	SDT	10.8.79	5.30	1- 90	30.28	6.76	268.0	3.72	4.63	2.11	-	-	-	-	-
						2- 90	34.57	8.22	252.0	3.96	5.28	2.75	-	-	-	-	-
						3- 90	39.87	10.03	238.0	4.19	6.09	3.66	-	-	-	-	-
						4-90	44.34	11.57	229.0	4.35	6.78	4.53	-	-	-		
						5-90	49.27	13.17	224.0	4.45	7.53	5.59	-	-	-		
			APT	12.8.79	5.30	1290	39.87	10.30	232.0	-	-	-		-	1576	27.4	-
3.	**Haripur**	EW	SDT	04.10.91	1.13	1- 50	5.20	3.83	-	-	3.12	0.68	82.0	-	-	-	-
						2- 50	6.60	5.24	-	-	3.96	1.09	78.0	-	-	-	-
						3- 50	7.60	6.20	-	-	4.56	1.44	75.0	-	-	-	-
						4- 50	9.00	7.52	-	-	5.40	2.03	72.0	-	-	-	-
			APT	05.10.91	0.43	1000	8.33	7.12	70.0	-	-	-	-	-	410	8.5	2.38×10^{-3}
		OW			3.70		-	0.68	-	-	-	-	-		470		
4.	**Raj-nagar**	EW	SDT	03.9.79	2.0 m agl	1- 60	30.23	17.93	101.0	9.88	16.87	1.18	-	-	-	-	-
						2- 60	34.52	22.27	92.0	10.75	19.26	1.34	-	-	-	-	-
						3- 60	38.30	23.48	97.0	10.22	21.37	1.49	-	-	-	-	-
						4- 60	42.08	24.98	101.0	9.89	23.48	1.64	-	-	-	-	-
			APT	05.9.79	2.0 m agl	720	42.08	25.01	-	-	-	-	-	-	222	4.10	
5	**Sat-chand**	EW	SDT	10.8.79	0.39 m agl	1- 60	17.95	7.80	137.0	7.24	7.70	1.71	-	9.41	-	-	-
						2- 60	21.78	10.24	133.0	7.83	9.36	2.70	-	12.06	-	-	-
						3- 60	25.25	12.09	125.0	7.98	10.80	2.41	-	13.21	-	-	-
						4- 60	26.77	12.97	123.0	8.07	11.52	2.56	-	14.08	-	-	-
			APT	08.9.79	0.425 m agl	600	25.25	12.48	121.0	-	-	-	-	-	887	17.75	-

RESULTS OF CHEMICAL ANALYSIS OF GROUND WATER FROM EXPLORATORY TUBE WELLS CONSTRUCTED BY CGWB

NORTH TRIPURA DISTRICT																		
Sl. No.	Village	Well Type	Test Type	Date of Collec-tion	pH	EC	TH	Ca	Mg	Na	K	CO_3	HCO_3	Cl	SO_4	NO_3	F	Fe
							in PPM											
Deo Basin																		
1.	Pechertal	EW	SDT	15.12.81	8.78	322	5	Tr	Tr	-	-	18	214	7	-	-	-	0.4
					8.66	322	7.5	Tr	Tr	-	-	15	195	7	-	-	-	0.4
					8.96	322	7.5	Tr	Tr	-	-	21	189	7	-	-	-	0.4
			APT	16.12.81	8.9	322	5	Tr	Tr	-	-	18	183	7	-	-	-	0.4
Juri Basin																		
2.	Panisagar BSF (1977)	EW	SDT	28.11.77	6.3	140	34	6.4	4.4	-	-	Nil	54	4	-	-	-	-
			APT	01.12.77	6.3	115	32	6.4	4	-	-	Nil	51	4	-	-	-	12
3.	Panisagar BSF (2005)	EW	SDT	09.9.05	6.35	115	35	6	4.9	-	-	Nil	43	25	1		0.12	-
					6.36	114	30	8	2.4	-	-	Nil	43	18	1		BDL	-
					6.34	113	35	8	3.6	-	-	Nil	43	21	1		0.08	-
					6.37	114	38	4	4.9	-	-	Nil	43	18	1		0.01	-
			APT	10.9.05	-	-	-	-	-	-	-	-	-	-	-	-	-	12.38
					-	-	-	-	-	-	-	-	-	-	-	-	-	21
4.	Dharmanagar	EW			6.5	180	40	14	1	12	2	-	98	7	-	-	-	9.3
5.	Ichaicherra	EW			8.3	180	60	12	7	-	-	-	60	7	-	-	-	-
6.	Tithaigram	EW			8.1	127	40	10	4	-	-	-	50	12	-	-	-	-
7.	Haflongcherra	EW			6.8	50	20	8	ND	1	3	-	37	7	-	-	-	7.3
8.	Sanicherra	EW			8	161	50	10	6	-	-	-	65	7	-	-	-	-
Manu Basin																		
9.	Chawmanu	EW			7.7	418	5	1	0.6	-	-	-	49	11	-	-	-	-

DHALAI DISTRICT																		
Sl. No.	Village	Well Type	Test Type	Date of Collec-tion	pH	EC	TH	Ca	Mg	Na	K	CO_3	HCO_3	Cl	SO_4	NO_3	F	Fe
							in PPM											
Dhalai Basin																		
1.	Abhanga	EW	SDT	07.6.79	8.1	130	70	18	6	-	-	0	73	18	-	-	-	0.3

				07.6.79	8.3	140	70	18	6	-	-	Tr	98	25	-	-	-	0.3
				07.6.79	8.3	135	65	20	4	-	-	Tr	92	25	-	-	-	0.25
				07.6.79	8.2	150	75	20	6	-	-	Tr	110	25	-	-	-	0.3
			APT	08.6.79	7.5	150	75	20	6	-	-	0	104	21	-	-	-	0.3
2.	Bhatkhawri	EW	SDT	03.7.79	8.3	110	50	12	5	-	-	Tr	67	14	-	-	-	0.4
				03.7.79	8.1	118	45	12	4	-	-	0	73	11	-	-	-	0.25
			APT	05.7.79	8.3	121	40	12	2.5	-	-	Tr	67	14	-	-	-	0.2
Manu Basin																		
3.	Karamcherra	EW	SDT	25.4.80	8.3	163	45	10	5	-	-	Tr	73	7	-	-	-	0.3
				25.4.80	8.4	146	-	-	-	-	-	-	-	-	-	-	-	0.5
				25.4.80	8.3	142	50	10	6	-	-	Tr	73	7	-	-	-	0.3
				25.4.80	8.2	146	50	12	5	-	-	0	73	7	-	-	-	0.3
			APT	26.4.80	8.1	146	45	10	5	-	-	0	79	7	-	-	-	0.2
4.	Tilakpara	EW	SDT	28.2.79	8	184	65	16	6	-	-	0	98	9	-	-	-	0.3
				28.2.79	7.2	180	65	14	7	-	-	0	92	7	-	-	-	0.3
				28.2.79	8	180	65	16	6	-	-	0	98	7	-	-	-	0.4
				28.2.79	7.8	180	60	12	7	-	-	0	98	7	-	-	-	0.45
			APT-1	25.5.79	8	172	60	14	6	-	-	0	92	7	-	-	-	0.45
			APT-2	25.5.79	7.2	163	60	12	7	-	-	0	90	7	-	-	-	0.45
		OW			7.8	163	55	12	6	-	-	0	79	5	-	-	-	0.4
5.	Chawmanu	EW	SDT	12.5.81	8.45	418	7.5	2	0.6	ND	ND	6	49	14	-	-	-	-
				12.5.81	8.45	408	7.5	1	1	ND	ND	3	49	18	-	-	-	-
				12.5.81	8.5	398	5	1	0.6	ND	ND	9	52	14	-	-	-	-
				12.5.81	7.65	449	7.5	2	0.6	ND	ND	0	52	14	-	-	-	-
			APT	13.5.81	7.7	418	5	1	0.6	ND	ND	0	49	11	-	-	-	-

KHOWAI DISTRICT																		
Sl. No.	**Village**	**Well Type**	**Test Type**	**Collec-tion Date**	**pH**	**EC**	**TH**	**Ca**	**Mg**	**Na**	**K**	**CO_3**	**HCO_3**	**Cl**	**SO_4**	**NO_3**	**F**	**Fe**
								in PPM (mg/lt)										
Khowai Basin																		
1	Baijalbari	EW	SDT	19.7.79	8.1	105	40	8	5	-	-	Nil	61	14	-	-	-	-
					8.2	100	40	8	5	-	-	Nil	61	14	-	-	-	0.3
			APT	22.7.79	8.1	95	45	8	6	-	-	Nil	67	14	-	-	-	0.2
2	Ashrambari	EW	APT	16.4.80	8.2	89	45	10	5	-	-	Nil	61	7	-	-	-	-
3	Khowai	EW	APT	09.10.7	6.75	22	86	16	11	-	-	Nil	132	2.8	-	-	-	-

				7		2												
4	Balucherra	EW	SDT	01.8.79	8	88	30	6	4	-	-	Nil	43	12	-	-	-	0.4
					7.3	90	35	8	4	-	-	Nil	37	12	-	-	-	0.3
			APT	03.8.79	7.3	88	35	8	4	-	-	Nil	49	12	-	-	-	0.2

WEST TRIPURA DISTRICT																		
Sl. No.	**Village**	**Well Type**	**Test Type**	**Collection Date**	**pH**	**EC**	**TH**	**Ca**	**Mg**	**Na**	**K**	**CO_3**	**HCO_3**	**Cl**	**SO_4**	**NO_3**	**F**	**Fe**
								in PPM (mg/lt)										
Haora Basin																		
1.	Arundhuti nagar	EW	SDT	27.1.82	6.86	154	80	26	4	-	-	Nil	91	7	-	-	-	-
			APT	29.1.82	6.9	150	85	26	5	-	-	Nil	95	7	-	-	-	-
2.	Bodhjung nagar	EW	SDT	24.7.06	7.2	158	40	12	2.4	-	-	Nil	61	18	14	-	0.5	8.93
		OW	APT	28.8.06	7.15	115	35	6	4.9	-	-	Nil	49	11	14	-	0.9	2.52
3.	Lichu-bagan	EW	SDT	25.2.07	6.45	110	40	8	4.7	-	-	Nil	67	7.1	1	-	0.0	12.3
					6.95	108	45	8	6.1	-	-	Nil	61	7.1	1	-	0.0	12.38
					6.95	108	40	8	4.7	-	-	Nil	67	7.1	1	-	0.0	12
					7.02	107	40	8	4.7	-	-	Nil	61	7.1	1	-	0.0	10.88
			APT	26.2.07	6.95	108	40	8	4.7	-	-	Nil	67	7.1	1	-	0.0	10.88
					6.99	108	45	8	6.1	-	-	Nil	61	7.1	1	-	0.0	9.38
4.	Narsin-garh	EW	CD	31.10.06	7.12	196	85	16	11	-	-	Nil	104	11	9	-	1.1	3.74
			SDT	17.3.07	6.71	175	70	18	6.1	-	-	Nil	98	7.1	5	-	0.1	5.56
				17.3.07	6.72	174	70	18	6.1	-	-	Nil	92	7.1	4	-	0.1	5.56
				17.3.07	6.71	173	65	18	4.9	-	-	Nil	92	7.1	5	-	0.1	5.4
				17.3.07	6.69	173	65	18	4.9	-	-	Nil	92	7.1	5	-	0.0	5.56
			APT	18.3.07	6.62	175	70	18	6.1	-	-	Nil	98	7.1	4	-	0.0	5.1
				18.3.07	6.63	175	65	18	4.9	-	-	Nil	98	7.1	5	-	0.0	5.1
5.	Belbari	EW	SDT	10.3.85	7.6	240	60	18	5.2	-	-	Nil	65	3.9	-	-	-	4.3
					7.2	230	60	18	5.2	-	-	Nil	60	3.6	-	-	-	4.2
					7.4	235	58	7.4	5.3	-	-	Nil	61	4	-	-	-	3.9
			APT	14.3.85	7.5	240	60	18	5.1	-	-	Nil	65	4.1	-	-	-	4
6.	Jirania Coconut Seed Farm	EW	SDT	04.5.86	8.5	96	6	8	10	-	-	24	49	7	-	-	-	10
				04.5.87	8.2	94	30	8	2	-	-	Nil	85	7	-	-	-	11.2
				04.5.88	8.5	92	30	8	2	-	-	24	49	14	-	-	-	11.5
				04.5.89	8.2	96	30	8	2	-	-	Nil	98	7	-	-	-	12.2
			APT	06.5.86	8.1	92	30	8	2	-	-	Nil	73	7	-	-	-	10
7.	GPA	EW	SDT	28.7.80	6.7	80	30	8	3	-	-	Nil	38	7	-	-	-	-
					6.9	86	30	8	3	-	-	Nil	33	7	-	-	-	-
					6.66	90	35	10	3	-	-	Nil	36	7	-	-	-	-
					7.1	80	30	8	3	-	-	Nil	36	7	-	-	-	-
			APT	30.7.80	6.9	92	35	8	4			Nil	35	7				0.3

																		5
8.	Salbagan	EW	SDT	24.8.79	7.45	105	9	35	6	-	-	Nil	49		-	-	-	5
					7.25	90	9	50	10	-	-	Nil	67		-	-	-	6
					7.5	100	9	45	10	-	-	Nil	49		-	-	-	5
			APT	26.8.79	6.5	92	18	30	6			Nil	49					4
9.	Champ-aknagar	EW	APT		8.1	236	100	32	5	-	-	Nil	98	21	-	-	-	-

SEPAHIJALA DISTRICT																		
Sl. No.	**Village**	**Well Type**	**Test Type**	**Collec-tion Date**	**pH**	**EC**	**TH**	**Ca**	**Mg**	**Na**	**K**	**CO_3**	**HCO_3**	**Cl**	**SO_4**	**NO_3**	**F**	**Fe**
								in PPM (mg/lt)										
Burigang Basin																		
1	Golaghati	EW	SDT	06.7.87	7.3	305	90	18	11	35	-	Nil	165	21	-	-	-	-
					7.5	305	85	22	7	25	-	Nil	153	11	-	-	-	2
					7.6	305	85	28	11	24	-	Nil	153	11	-	-	-	-
					7.6	294	85	18	12	19	-	Nil	153	11	-	-	-	-
					7.7	283	85	20	9	23	-	Nil	153	11	-	-	-	-
			APT	09.7.87	7.5	294	100	20	12	23	-	Nil	153	14	-	-	-	2
				10.7.87	7.6	294	90	22	9	21	-	Nil	153	11	-	-	-	1.8
2	Gokulnagar	EW	APT	30.3.76	8.15	123	60	10.02	8.5	-	-	Nil	92	7	-	-	-	-

GOMATI DISTRICT																		
Sl. No.	**Village**	**Well Type**	**Test Type**	**Date of Collec-tion**	**pH**	**EC**	**TH**	**Ca**	**Mg**	**Na**	**K**	**CO_3**	**HCO_3**	**Cl**	**SO_4**	**NO_3**	**F**	**Fe**
								in PPM (mg/lt)										
Gomati Basin																		
1	Dupthali	EW	SDT	11.12.91	6.89	179	85	22	7	10	2	Nil	73	21	-	-	-	5.4
					6.78	189	90	22	8	10	2	Nil	85	14	-	-	-	5
					6.78	188	85	22	7	10	2	Nil	79	14	-	-	-	5
			APT	14.12.91	7.2	188	80	22	6	8	2	Nil	73	14	-	-	-	4.9
2	Tulamura	EW	SDT	20.7.79	8.3	190	115	26	12	-	-	Tr	128	11	-	-	-	-
					8.3	185	120	26	13	-	-	Tr	122	14	-	-	-	-
			APT	21.7.79	8.6	210	115	20	16	-	-	9	122	11	-	-	-	0.4
3	Ompinagar	EW	APT	18.5.76	7.4	106	35	10	2.4	-	-	Nil	79	7	-	-	-	-

SOUTH TRIPURA DISTRICT																		
Sl. No.	**Village**	**Well Type**	**Test Type**	**Date of Collec-tion**	**pH**	**EC**	**TH**	**Ca**	**Mg**	**Na**	**K**	**CO_3**	**HCO_3**	**Cl**	**SO_4**	**NO_3**	**F**	**Fe**
							in PPM (mg/lt)											
Muhari Basin																		

1.	Rajanagar	EW	SDT	03.9.79	7.6	130	65	16	6	-	-	Nil	80	14	-	-	-	-
					6.9	135	65	16	6	-	-	Nil	91	14	-	-	-	0.45
			APT	04.9.79	6.9	130	65	16	6	-	-	Nil	85	14	-	-	-	-
2.	Rajapur	EW	SDT	10.8.79	8	116	50	16	2.5	-	-	Nil	73	14	-	-	-	-
					7.7	120	50	16	2.5	-	-	Nil	61	11	-	-	-	0.3
			APT	12.8.79	8.1	120	55	16	4	-	-	Nil	67	11	-	-	-	0.2
3.	Matai	EW			6.7	82	25	6	2	4	2	-	31	11				5
4.	Ghoshkhamar	EW			8	56	40	10	4	2	2	-	31	11				4.8
Fenny Basin																		
5.	Haripur	EW	SDT	04.10.91	7.74	45	25	8	1	1	3	Nil	18	7	-	-	-	1.9
					7.56	40	25	8	1	1	3	Nil	18	7	-	-	-	1.3
					7.63	41	25	8	1	1	3	Nil	18	7	-	-	-	1.2
					7.63	40	25	8	1	1	3	Nil	18	7	-	-	-	1.2
			APT	05.10.91	7.56	42	25	8	1	1	3	Nil	18	7	-	-	-	0.7
				06.10.91	7.33	77	65	14	7	10	3	Nil	49	18	-	-	-	0.2
6.	Satchand	EW	SDT	07.9.79	6.9	130	75	16	8.5	-	-	Nil	92	9	-	-	-	-
			APT	08.9.79	7.1	130	70	14	8.5	-	-	Nil	92	9	-	-	-	0.4