Annex B
Meteorology and Hydrology

ANNEX B

METEOROLOGY AND HYDROLOGY

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B.1   METEOROLOGY

B.1.1   Climate Data

The climatic data pertaining to rainfall, temperature, humidity and wind velocity are available at the several meteorological stations observed by the Department of Meteorological Services, Government of Pakistan. The records of Surface Water Hydrology Project (SWHP) undertaken by WAPDA are also available, besides old precipitation data observed by U.K. Meteorological Office in the colonial age. Available climatic stations and their data regarding the Study Area are shown in Fig.B.1.1 and Table B.1.1.

The meteorological factors of Quetta atation as a most common values in the Study Area are shown in Table B.1.2, and monthly rainfall data of other major stations concerning the Study Area are showen in Table B.1.3 to B.1.7.

B.1.2   Correlation Relation of Rainfall with Distance

There are limited available records of rainfall in the Study Area. Sometimes some rainfall sequence should be estimated using existing rainfall record in other meteorological stations in consideration with correlation relation between subjected site and the refereed station. Correlation relation of rainfall is influenced by distance. Relation between correlation coefficient of daily rainfall and distance was studied using actual daily rainfall sequence of 11 meteorological sites concerning the Study Area. Result of the study is shown in Table B.1.8 Fig.B.1.2 and Fig.B.1.3.

According to the result, it can be judged that little correlation relation is recognized when it is far from more than 100 km. Generally speaking, significant correlation relation of rainfall seems to be identified in the distance of less than 50 km, while other topographical influence suffers from lowering of the correlation coefficient.

B.1.3   Probability Analysis of Short Term Duration Rainfall

Despite of scarce amount of rainfall, short termed rainfall with high intensity curses particularly in summer season. There are a few meteorological stations in which hourly rainfall record is available. Table B.1.9 shows actual rainfall record in short duration of Killi Kotwal and Bandat

Jungle stations. The difference of rainfall pattern between both seasons in typical compared in Fig. B.1.4.

Provable rainfall intensity within the Study Area were analyzed using each duration rainfall records at Killi Kotwal Station as follows: According to the result of analysis, significant difference in the provable rainfall intensity between both seasons were recognized.

(mm/hr)

Return period	Rainfall Duration									
	1hr		3hr		6hr		12hr		24hr	
	Winter	Summer	Winter	Summer	Winter	Summer	Winter	Summer	Winter	Summer
2 Years	8.5	15.5	4.5	8.3	3.1	4.3	2.1	2.5	1.2	1.3
5 Years	13.1	20.9	5.9	12.2	4.1	6.1	3.1	4.3	1.8	2.4
10 Years	16.1	24.5	6.9	14.8	4.8	7.4	3.7	5.5	2.2	3.1
20 Years	19.0	28.0	7.8	17.3	5.4	8.6	4.4	6.6	2.5	3.7
30 Years	20.6	30.0	8.3	18.7	5.8	9.3	4.7	7.2	2.7	4.1
50 Years	22.7	32.5	9.0	20.5	6.2	10.1	5.2	8.0	3.0	4.6
100 Years	25.5	35.8	9.8	22.9	6.9	11.3	5.8	9.1	3.4	5.3
200 Years	28.3	39.2	10.7	25.4	7.5	12.5	6.4	10.2	3.7	5.9

Provable analysis above were using records of the Killi Kotowal Station.

B.1.4   Typical Analysis for Recharge to Groundwater

Actual groundwater recharge is difficult to accurately estimate due to no uniformity of hydrogeologic condition in the area and topographic condition etc. However, amount of groundwater recharge ought to be sheared within amount of rainfall as well as actual evaporation and surface runoff. Though actual groundwater recharge is difficult to directly estimate, other rainfall apportionment of evaporation and surface runoff can be estimated through simple water economy calculation considering soil moisture history. Simple soil layer model having certain capacity of water was conceived. Soil moisture was calculated inputting infiltration which is rainfall subtracting surface runoff, outputting actual evaporation on the soil. Table B.1.10 shows daily water economy analysis applying typical conditions. General water economy in the Study Area by seasons are summarized in following table.

Components	Winter	Summer	through year
Runoff*	5 - 8 %	10 - 15 %	5 - 10 %
Evaporation**	60 - 70 %	80 - 90 %	60 - 70 %
Recharge**	20 - 35 %	0 - 5 %	20 - 35 %
Rainfall	100 %	100 %	100 %

* :Runoff factor is an estimation using runoff records of Chapper Lift Station.
** :These figures were derived through the analysis.

B.2 WATER QUALITY

Some water quality study reports state that almost all water is good for drinking and irrigation use in the area. Exceptionally a bacillus contamination was reported in the tapped water at Quetta urban area, and possible salinity in some limited areas. The deep groundwater itself is commonly no problem in its quality.

Water quality in the Study area was tested to confirm its suitability for irrigation and drinking purposes. The water quality test was done for the 100 samples collected from tubewells, shallow wells, karezes, spring, etc. at the beneficial areas of the 10 existing and 13 proposed dams. The 14 test items are listed below.

General information:
    Temperature, pH

Salinity:
    Electric Conductivity (EC), Total Dissolved Solid (TDS), Sodium Adsorption
    Ration (SAR)

Contamination and others:
    Chemical Oxygen Demand (COD), Biochemical Oxygen Demand (BOD)
    Cl-, NO2-, NO3-, NH4+
    Suspended Solid (SS)
    E.coli., Common Bacillus

All results of the test are shown in Table B.2.1. The most important characteristic in water, salinity are summarized by site and water source in the following table, even though there are variances in data.

Results of Water Quality Test (Salinity)

DAD	Number of Samples	TDS (ppm)	EC (µS)	SAR (%)	Class** (Average)
Existing DADs					
Khora Manda	4	935	1,446	12.0	C3S2
Marium	4	103	193	4.1	C1S1
Bostan	3	480	761	7.4	C3S1
Khushab	4	513	810	10.6	C3S2
Tirkha	3	760	1,183	10.5	C3S2
Amach	3	190	325	2.5	C2S1
Kad Koca I	3	150	265	4.5	C2S1
Gorpad	4	1,857	2,833	22.4	C4S4
Laghmgir Sarbund*	4	503	795	3.7	C3S1
Proposed DADs					
Brewary	5	486	770	2.1	C3S1
Ghutai Shela	5	1,050	1,619	4.6	C3S1
Wali Dad	5	262	433	2.1	C2S1
Dara	5	328	533	7.7	C2S1
Murgi Kotal	5	356	575	12.3	C2S2
Kach	5	212	358	4.8	C2S1
Jigda	5	390	626	8.7	C2S2
Sanzali	5	618	969	9.1	C3S2
Arambi	5	184	316	1.1	C2S1
Sakhol	5	712	1,110	3.1	C3S1
Mangi	9	573	902	5.4	C3S1
Kad Kocha II	5	192	328	2.4	C2S1
Iskalkoo	5	208	352	2.1	C2S1
By Water Source					
Tubewell	64	452	719	6.2	C2S1
Shallow Well	16	623	977	5.6	C3S1
Karez	7	319	518	7.2	C2S1
Spring	9	732	1,141	8.2	C3S2
Piped Water	4	551	868	6.2	C3S1

Note*:   Included in Mangi area.
Note**:   Refer to Fig. B.3.1.
Source: JICA Study Team

The values of TDS can classify water into 4 classes of low (< 500 ppm), medium (500 - 1,500 ppm), high (1,500 - 2,500 ppm) and very high (> 2,500 ppm). Almost all water in the test are low to medium salinity class in line with this standard. High salinity is observed in only 3 samples from shallow wells at Quetta urban area and very high in a sample of spring water at Gorpad area.

Regarding water salinity specially for irrigation use, another classification of water was done based on the combination of EC and SAR, as shown in Fig. B.2.1. About 70 % of the samples are in the classes of C1S1 (low salinity and low sodium) and C2S1 (medium salinity and low sodium). In the are of Gorpad, very high salinity and alkali hazard may occur on the crop growth when the water is used for irrigation. In the other areas proper selection and management of crops can avoid from such hazard.

The other chemical and biological data show that almost all water can be used for both irrigation and drinking purposes.

In conclusion, the water quality in the area is suitable or possible for drinking and irrigation purposes. Salinity and alkali hazered is only a problem in irrigation use at the limited sites.

Table B.1.1 Rainfall Stations and Their Mean Monthly Rainfall Concerning the Study

Station	Ob.	Elev. (feet)	Duration	Lat.	Long.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
(Quetta District)																		
Beleli	UK	-	1891 - 1946	30-15'	66-57'	45.0	43.4	35.6	17.5	4.1	2.8	5.8	5.6	0.5	2.3	5.6	25.9	193.8
Dirgi	UK	-	1891 - 1937	30-19'	67-31'	36.6	47.2	37.1	19.6	8.6	8.9	25.7	17.0	4.8	4.6	5.1	23.6	238.3
Kach **	SU	6,350	1891 -	30-26'	67-18'	51.1	53.1	49.8	21.3	7.4	3.8	13.5	7.4	1.3	1.8	6.4	26.4	244.3
Killi Kotwal*,**	SW	5,700	1970-	30-15'	67-01'	44.4	38.9	56.4	17.8	4.3	4.1	8.4	12.7	0.8	0.0	2.5	23.1	221.2
Mangi	UK	-	1891 - 1937	30-21'	67-30'	34.0	48.0	42.4	16.5	6.9	6.4	17.3	9.9	3.0	3.6	4.8	22.1	213.6
Mud Gorge	UK	-	1891 - 1908	30-23'	67-24'	45.5	46.2	55.1	18.5	10.7	7.4	9.7	6.9	1.3	2.0	8.4	22.9	240.8
Quetta**	PM	5,253	1891 -	30-15'	66-53'	49.8	49.5	40.4	21.1	9.4	4.3	11.2	7.4	1.0	2.8	6.1	28.2	230.1
Sariab	SU	5,640	1900 -	30-06'	66-59'	36.6	32.0	35.1	15.5	4.8	3.3	9.9	8.4	0.8	1.3	3.3	17.8	168.7
Urak	UK	-	1914 - 1946	30-16'	67-11'	58.2	62.5	50.5	27.9	14.7	7.4	31.0	16.0	3.0	4.3	5.8	35.3	312.4
Wali Tangi *	SW	9,000	1961-	30-15'	67-15'	33.8	31.5	84.3	27.2	7.4	3.6	23.1	24.9	3.0	0.3	5.1	34.2	283.5
(Qila Abdullah District)																		
Chaman	OT	-	1893 -	30-56'	66-27'	52.6	46.5	38.1	18.3	3.0	0.5	3.0	1.0	0.5	3.0	5.3	32.5	211.8
Gulistan	UK	-	1891 - 1949	30-36'	66-35'	55.1	44.4	34.3	10.2	1.8	0.5	4.1	0.8	0.3	1.8	5.3	27.9	181.4
Qila Abdullah**	SU	-	1891 -	30-43'	66-37'	63.2	54.4	43.9	14.5	3.0	0.5	3.6	0.8	2.3	2.3	7.1	33.3	227.1
Shela Bagh	UK	-	1892 - 1948	30-49'	66-35'	79.0	74.2	76.7	29.0	5.8	1.8	6.4	2.5	0.0	2.8	9.9	48.5	337.1
(Pishin District)																		
Bandat Jungle**	SW	1,500	1969-	30-29'	67-25'	48.0	50.8	57.9	17.0	4.8	1.8	21.6	18.8	1.5	0.8	5.6	21.3	258.3
Barshore	UK	-	1909 - 1921	30-46'	67-13'	63.8	40.6	54.6	25.1	5.6	7.1	7.1	7.6	0.0	5.3	11.4	46.5	285.5
Bund K. Khan	SU	-	1909 -	30-40'	66-58'	66.5	48.5	43.9	19.1	4.3	1.0	5.8	3.6	0.3	2.0	4.1	32.0	229.4
Bostan	UK	-	1891 - 1950	30-26'	67-01'	50.5	46.2	41.9	17.5	5.8	1.8	6.1	4.1	0.5	2.3	5.6	26.6	208.8
Fullers Camp	UK	-	1891 - 1907	30-27'	67-13'	50.8	57.9	67.3	28.7	10.2	4.6	8.1	2.5	1.0	2.5	8.6	29.0	269.7
Khanai	UK	-	1891 - 1946	30-29'	67-09'	43.4	47.5	38.6	14.5	3.0	3.3	6.1	3.0	0.3	2.5	5.1	26.9	195.1
Kuchlak	UK	-	1891 - 1950	30-21'	66-56'	47.5	39.1	36.6	15.2	5.3	1.5	7.1	2.8	1.3	2.3	5.6	26.4	191.0
Pishin**	UK	-	1891 - 1950	30-35'	66-59'	58.7	53.6	45.7	20.8	5.8	1.3	4.8	4.6	0.5	3.0	6.6	34.0	238.5
Sabura	UK	-	1913 - 1919	31-03'	67-16'	26.4	65.0	68.1	35.3	26.2	0.5	1.0	29.2	0.0	0.5	16.3	21.6	282.2
Saranan	UK	-	1895 - 1950	30-34'	66-52'	51.3	42.4	35.3	15.0	3.0	1.0	4.8	1.8	0.0	2.8	7.1	30.7	193.3
Shebo	UK	-	1930 - 1946	30-32'	66-56'	67.6	54.9	32.5	16.0	3.8	2.0	9.4	3.3	0.3	1.0	2.3	28.7	213.9
Siran Tangi	SW	6,900	1961-	30-24'	67-12'	41.4	45.5	63.0	22.1	7.1	3.6	20.1	15.0	1.0	0.5	4.6	28.4	258.6
Surkhab h/w	UK	-	1930 - 1946	30-35'	67-05'	74.7	51.1	36.1	23.4	6.4	2.0	12.9	5.6	0.0	0.3	2.8	29.7	249.2
Syad Hamid	UK	-	1891 - 1915	30-35'	66-45'	48.5	53.3	41.9	15.5	15.2	1.0	1.0	1.0	0.0	2.3	11.4	31.8	210.8
Tor Morga h/w	UK	-	1930 - 1946	30-42'	67-04'	77.0	54.1	40.1	20.3	5.1	2.0	8.9	2.3	0.0	0.3	2.3	29.7	242.1
Yaru Karez	UK	-	1891 - 1946	30-31'	66-57'	42.2	40.1	35.3	16.8	4.6	0.8	4.6	3.3	0.0	1.8	4.3	29.7	186.2
(Mastung District)																		
Abigum	UK	-	1896 - 1946	29-49'	67-21'	22.1	23.1	16.8	6.9	2.0	5.1	19.8	20.1	3.3	0.8	2.0	9.7	133.9
Hirok	UK	-	1891 - 1946	29-56'	67-14'	64.3	75.2	20.6	18.3	1.0	15.0	39.4	29.0	8.4	2.8	6.6	22.8	309.9
Kanak	UK	-	1906 - 1950	29-58'	66-46'	32.3	36.6	22.9	10.4	3.6	2.0	8.9	9.1	0.8	1.8	2.8	18.8	152.1
Kirda Gap	UK	-	1906 - 1946	29-44'	66-27'	41.7	43.7	23.1	9.9	1.8	0.8	8.6	3.8	0.8	1.8	2.8	24.4	162.3
Kolpur	UK	-	1891 - 1950	29-54'	67-08'	45.5	37.3	31.5	11.7	4.3	3.8	19.3	13.0	2.8	2.8	4.1	20.8	196.6
Mach **	SU	3,200	1892 -	29-52'	67-20'	32.8	32.5	25.1	10.9	6.6	5.6	32.5	32.5	7.6	1.3	2.3	15.0	207.0
Mastung Road**	PM	-	1906 - 1960	29-51'	66-50'	37.1	42.4	22.9	11.2	3.0	2.0	4.1	2.8	0.8	1.8	3.6	17.5	151.1
Mastung	UK	-	1911 - 1950	29-48'	66-50'	48.5	39.4	30.7	17.3	7.6	3.6	7.4	4.3	2.8	2.3	4.8	23.9	191.3
Shaikhwasil	UK	-	1907 - 1950	29-52'	66-34'	58.9	43.2	24.4	12.7	1.5	0.8	7.6	3.6	0.0	2.0	3.3	34.8	190.5
Spezand	SU	5,850	1901 -	29-59'	67-00'	40.4	35.8	33.0	11.9	3.6	1.0	10.2	4.3	0.8	0.8	2.3	17.2	160.8
(Kalat District)																		
Kalat **	PM	6,617	1891 -	29-02'	66-35'	39.1	37.1	28.4	11.9	4.8	4.1	18.5	10.7	2.5	2.0	5.8	18.0	190.8
Mangochar	UK	-	1912 - 1950	29-22'	66-37'	29.2	25.4	20.3	7.9	1.0	1.5	15.2	5.8	2.3	2.3	5.3	19.8	136.9
Surab	SU	5,700	1925 -	28-30'	66-15'	49.3	40.4	33.3	16.3	7.1	3.6	36.1	12.7	0.8	1.3	6.4	22.4	232.2

Ob.: Observing Agencies
PM -- Pakistan Meteorological Office, Government of Pakistan
SW -- Surface Water Hydrology Project undertaken by WAPDA, now being taken over by BWR
SU -- Same as above stations succeeded from UK
UK -- Old colonial rainfall recording office
OT -- Other agency

* : Hourly rainfall data are available.
** : Climatological data are available.

Table B.1.2 Meteorological Factors of Quetta Station

Name of station: Quetta Observed year: 1891 - 1995 (vary depend upon factors)

Items	Unit	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Annual
Precipitation	mm	49.8	49.5	40.4	21.1	9.4	4.3	11.2	7.4	1.0	2.8	6.1	28.2	230.1
Temperature														
Monthly Max.	C°	10.8	12.9	18.7	24.8	30.4	35.3	35.9	34.8	31.4	25.5	19.2	13.3	24.4
Monthly Mean	C°	3.7	6.0	11.1	16.6	21.0	25.6	27.9	26.4	21.2	14.7	9.2	5.1	15.7
Monthly Min.	C°	-3.4	-0.9	3.4	8.3	11.5	15.9	19.9	17.9	10.9	3.8	-0.9	-3.2	6.9
Bright Sunshine	Hrs	221.6	208.5	232.6	272.5	334.2	325.6	313.5	312.5	294.4	307.2	278.2	238.7	278.3
Solar Radiation	MJ/M	12.0	14.3	17.0	20.9	24.4	26.3	25.2	24.1	22.5	19.7	16.3	12.0	19.5
Wind Mean Speed	Knots	3.0	3.5	3.9	4.0	3.8	4.4	5.3	3.8	2.8	2.2	2.5	2.2	3.4
Relative humidity	%	50.0	50.0	43.0	35.0	27.0	21.0	26.0	24.0	22.0	24.0	29.0	43.0	33.0
Pan Evaporation	mm	116.0	138.0	183.0	240.0	265.0	297.0	427.0	384.0	250.0	150.0	121.0	109.0	223.3

Mean Monthly Rainfall of Quetta Station

(Unit:mm)

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Annual
1891 I 1946	38.0	34.0	33.0	15.0	5.0	0.0	3.0	0.0	0.0	0.0	1.0	19.0	210.0
1947 I 1960	80.2	114.8	35.2	24.8	33.5	29.8	38.1	28.1	0.7	11.7	29.8	54.9	481.5
1961	19.1	36.3	11.2	73.2	2.3	4.8	10.9	1.3	0.0	0.0	8.6	33.5	201.2
1962	0.5	7.6	78.0	59.7	5.3	0.0	2.5	0.0	0.0	0.0	0.0	7.9	161.5
1963	0.0	30.0	23.1	41.9	39.9	0.0	0.0	0.0	0.0	0.0	7.1	9.4	151.4
1964	85.9	11.7	38.1	28.2	0.3	0.0	7.4	0.0	0.0	0.0	0.0	7.1	178.7
1965	49.0	15.0	17.3	118.9	0.0	0.0	2.5	0.0	0.0	0.0	25.4	38.4	266.5
1966	1.8	52.6	10.2	38.9	0.0	0.0	25.1	0.0	0.0	10.4	0.0	0.0	139.0
1967	7.1	82.8	63.2	36.1	0.5	0.0	3.0	2.5	0.0	0.0	4.3	44.7	244.2
1968	67.6	77.2	11.9	7.1	16.3	0.0	3.0	0.0	0.0	0.0	0.0	42.9	226.0
1969	18.5	22.1	6.1	34.5	18.0	0.0	23.1	0.0	0.0	0.0	1.8	13.7	137.8
1970	96.0	15.2	33.5	2.0	0.0	0.0	1.5	15.5	7.6	0.0	0.0	7.1	178.4
1971	7.4	21.8	16.0	0.0	1.3	0.0	0.0	0.0	0.0	0.0	0.0	15.7	62.2
1972	87.6	22.4	52.3	44.7	2.6	2.5	1.3	0.0	0.0	0.0	0.0	40.9	254.3
1973	82.8	18.0	9.7	0.8	1.3	0.0	38.1	0.0	0.0	0.0	0.0	56.9	207.6
1974	69.6	120.3	0.0	2.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	17.9	210.6
1975	78.2	45.2	46.9	7.1	0.0	0.0	7.3	28.0	1.0	0.0	0.0	18.6	232.3
1976	31.2	74.4	136.8	24.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	5.8	274.2
1977	91.5	6.0	0.6	10.4	16.0	19.2	48.1	14.0	0.0	0.0	25.2	8.6	239.6
1978	68.0	58.3	18.2	16.5	0.0	0.0	121.8	1.1	0.0	0.0	23.1	10.5	317.5
1979	70.8	90.2	112.3	7.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	68.1	348.9
1980	69.9	30.0	95.5	2.7	0.0	5.2	0.0	0.0	0.0	24.8	13.1	3.6	244.8
1981	111.9	105.1	63.5	0.0	17.0	0.0	2.0	0.0	0.0	13.0	0.0	35.0	347.5
1982	178.0	189.2	232.4	30.4	23.0	0.0	0.0	50.0	0.0	68.8	16.0	162.0	949.8
1983	61.0	61.0	68.1	148.0	29.0	0.0	22.0	173.0	0.0	0.0	0.0	71.2	633.3
1984	58.2	19.4	40.5	5.8	0.0	0.0	0.0	1.3	0.0	0.0	0.0	18.0	143.2
1985	54.6	0.0	78.0	88.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	35.7	257.1
1986	4.2	102.8	45.8	0.0	0.0	0.0	1.0	66.0	0.0	0.0	19.6	4.5	243.9
1987	18.4	30.2	93.1	2.0	5.0	0.0	0.0	7.1	0.0	0.0	0.0	0.0	155.8
1988	29.6	14.8	121.1	0.0	0.0	0.0	59.5	0.0	0.0	0.0	0.0	34.0	259.0
1989	46.7	30.4	86.2	13.0	0.0	0.6	1.2	0.6	0.0	0.0	13.0	51.4	243.1
1990	137.1	79.5	40.8	2.8	0.0	0.0	0.0	1.6	0.0	0.0	1.0	50.4	313.2
1991	76.6	41.7	104.8	38.0	21.8	0.0	0.0	0.0	7.6	0.0	8.5	16.8	315.7
1992	46.0	53.6	32.2	89.2	13.2	0.0	0.0	15.4	0.0	12.2	0.0	48.4	310.2
1993	110.0	28.9	51.9	12.1	4.1	2.1	0.5	0.0	0.0	0.0	0.0	0.0	209.6
1994	20.6	47.1	26.6	8.3	19.7	0.0	67.6	6.2	78.8	0.0	0.4	21.1	296.4
1995	23.5	45.5	35.5	32.3	0.0	0.0	25.7	0.0	0.0	1.2	0.0	128.9	292.6
Mean	49.8	49.5	40.4	21.1	9.4	4.3	11.2	7.4	1.0	2.8	6.1	28.2	230.1

Table B.1.3   Monthly Rainfall of Killi Kotwal Station

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Annual
1961	-	-	-	-	-	-	-	-	-	-	-	-	-
1962	-	-	-	-	-	-	-	-	-	-	-	-	-
1963	-	-	-	-	-	-	-	-	-	-	-	-	-
1964	-	-	-	-	-	-	-	-	-	-	-	-	-
1965	-	-	-	-	-	-	-	-	-	-	-	-	-
1966	-	-	-	-	-	-	-	-	-	-	-	-	-
1967	-	-	-	-	-	-	-	-	-	-	-	-	-
1968	-	-	-	-	-	-	-	-	-	-	-	-	-
1969	-	-	-	-	-	-	-	-	-	-	-	-	-
1970	-	-	-	-	-	-	-	-	0.0	0.0	6.1	0.0	-
1971	19.8	17.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	26.4	63.8
1972	46.7	74.9	24.9	33.3	0.0	51.8	0.0	0.0	0.0	0.0	14.0	41.7	287.3
1973	14.0	6.9	7.4	0.0	0.0	3.6	35.6	0.0	0.0	0.0	-	-	-
1974	-	-	4.3	8.1	0.0	0.0	0.0	1.0	0.0	0.0	32.3	22.1	-
1975	103.1	14.0	25.7	16.3	0.0	0.0	69.9	0.0	0.0	0.0	9.7	25.9	264.4
1976	39.6	88.1	63.8	0.0	0.0	9.4	0.0	0.0	0.0	0.0	0.0	39.6	240.5
1977	20.6	1.3	19.6	0.0	4.6	84.6	0.0	0.0	0.0	19.3	12.7	15.2	177.8
1978	54.9	15.7	6.4	0.0	0.0	104.4	0.0	2.5	0.0	0.0	0.0	15.7	199.6
1979	69.3	78.0	12.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.4	73.2	241.6
1980	56.4	43.9	22.6	0.0	0.0	40.4	0.0	0.0	0.0	21.1	26.2	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	60.7	102.1	128.0	4.3	15.0	0.0	0.0	24.4	0.0	29.0	17.3	80.3	461.0
1983	36.8	4.6	56.4	59.4	24.1	0.0	1.3	39.9	0.0	0.0	0.0	41.9	264.4
1984	27.7	9.1	27.4	8.9	0.0	20.3	0.0	0.0	0.0	0.0	0.0	39.4	132.8
1985	34.8	0.0	2.3	46.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	34.3	118.1
1986	14.7	43.9	68.1	0.0	0.0	0.0	0.8	86.6	0.0	0.0	20.3	10.4	244.9
1987	22.1	85.3	90.2	3.3	14.0	12.7	0.0	22.4	0.0	0.8	0.0	0.0	250.7
1988	14.5	13.7	95.3	12.2	0.0	0.0	5.8	0.5	0.0	0.0	0.0	20.1	162.1
1989	33.3	24.6	90.4	5.3	2.5	8.4	52.8	0.0	0.0	0.0	9.9	41.9	269.2
1990	125.2	130.3	40.1	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	37.3	335.0
1991	78.2	72.4	100.8	50.0	15.2	0.0	0.0	0.0	14.0	0.0	8.9	29.0	368.6
1992	-	-	-	-	-	-	-	-	-	-	-	-	-
1993	20.1	26.7	34.3	18.0	0.0	4.8	0.0	0.0	0.0	0.0	0.0	0.0	103.9
1994	-	-	-	-	-	-	-	-	-	-	-	-	-
1995	-	-	-	-	-	-	-	-	-	-	-	-	-
Mean	44.6	42.7	43.8	12.8	3.6	16.2	7.9	8.4	0.6	3.2	7.9	29.7	232.5

Table B.1.4   Monthly Rainfall of Spezand Station

(Unit:mm)

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Annual
1961	-	-	-	-	-	-	-	-	-	-	-	-	-
1962	-	-	-	-	-	-	-	-	-	-	-	-	-
1963	-	-	-	-	-	-	-	-	-	-	-	-	-
1964	-	-	-	-	-	-	-	-	-	-	-	-	-
1965	-	-	-	-	-	-	-	-	-	-	-	-	-
1966	-	-	-	-	-	-	-	-	-	-	-	-	-
1967	-	-	-	-	-	-	-	-	-	-	-	-	-
1968	-	-	-	-	-	-	-	-	-	-	-	-	-
1969	-	-	-	-	-	-	-	-	-	-	-	-	-
1970	-	-	-	-	-	-	-	-	-	-	-	-	-
1971	-	-	-	-	-	-	-	-	-	-	-	-	-
1972	103.6	39.4	116.8	38.1	0.0	0.0	0.0	0.0	0.0	1.3	0.0	82.6	381.8
1973	78.7	25.4	12.7	10.2	0.0	0.0	105.4	-	-	0.0	-	-	-
1974	-	-	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	20.8	-
1975	31.8	33.0	20.3	0.0	0.0	0.0	0.0	10.2	0.0	0.0	0.0	7.6	102.9
1976	26.7	59.7	44.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	132.1
1977	25.4	0.0	0.0	0.0	-	17.8	6.4	0.0	0.0	0.0	5.1	1.3	-
1978	31.8	38.1	2.5	0.0	0.0	0.0	36.8	6.4	0.0	0.0	5.1	0.0	120.7
1979	14.0	55.9	45.7	6.4	0.0	0.0	0.0	0.0	0.0	1.3	0.0	82.6	205.7
1980	45.7	81.3	116.1	0.0	0.0	15.2	0.0	0.0	0.0	10.2	14.0	5.1	287.5
1981	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	76.2	177.8	232.2	8.9	59.9	0.0	0.0	33.0	0.0	27.9	0.0	44.7	660.7
1983	33.0	39.4	44.5	55.9	35.6	0.0	20.3	72.4	0.0	0.0	0.0	45.7	346.7
1984	19.6	14.0	12.7	2.5	0.0	0.0	22.9	12.7	0.0	0.0	0.0	29.7	114.0
1985	30.5	0.0	11.4	71.1	0.0	0.0	15.2	10.2	0.0	0.0	0.0	21.8	160.3
1986	2.5	88.9	66.0	0.0	0.0	0.0	12.7	26.9	0.0	0.0	0.0	5.1	202.2
1987	17.8	46.2	89.4	16.5	12.7	12.7	0.0	2.5	0.0	0.8	0.0	0.0	198.6
1988	16.5	15.2	59.7	33.0	0.0	0.0	2.5	12.7	0.0	0.0	0.0	63.5	203.2
1989	119.4	35.6	91.4	2.5	12.7	2.5	25.4	0.0	0.0	0.0	12.7	34.3	336.6
1990	97.8	83.8	43.2	3.8	0.0	0.0	0.0	2.5	0.0	0.0	0.0	55.9	287.0
1991	73.7	124.5	110.5	45.7	10.2	0.0	0.0	0.0	0.0	0.0	17.8	8.9	391.2
1992	-	-	-	-	-	-	-	-	-	-	-	-	-
1993	65.3	6.4	63.5	15.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	150.4
1994	-	-	-	-	-	-	-	-	-	-	-	-	-
1995	-	-	-	-	-	-	-	-	-	-	-	-	-
Mean	47.9	50.8	59.2	15.5	6.9	2.4	12.4	10.0	0.0	2.1	2.9	26.9	251.8

Table B.1.5   Monthly Rainfall of Siran Tangi Station

(Unit:mm)

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Annual
1961	-	-	-	-	-	-	-	-	-	-	-	-	-
1962	-	-	-	-	-	-	-	-	-	-	-	-	-
1963	-	-	-	-	-	-	-	-	-	-	-	-	-
1964	-	-	-	-	-	8.9	13.2	-	-	-	-	10.4	-
1965	15.5	14.2	24.1	65.8	0.0	0.0	0.0	0.0	0.0	0.0	1.5	24.6	145.8
1966	5.1	53.3	2.5	41.9	0.0	5.1	14.5	0.0	0.0	7.6	0.0	0.0	130.0
1967	0.0	104.1	85.9	33.5	0.0	0.0	0.0	0.0	0.0	0.0	10.2	27.9	261.6
1968	53.3	-	5.1	0.0	7.9	0.0	2.8	0.0	0.0	0.0	0.0	53.3	-
1969	52.1	22.9	17.8	15.2	30.5	0.0	25.4	0.0	0.0	0.0	2.5	5.1	171.5
1970	27.9	17.8	45.7	0.0	10.2	0.0	2.5	2.5	0.0	0.0	0.0	0.0	106.7
1971	-	-	-	-	-	-	-	-	-	-	-	-	-
1972	48.3	53.3	85.1	22.9	7.6	15.2	12.7	0.0	0.0	0.0	5.1	17.8	268.0
1973	20.3	33.0	52.1	0.0	0.0	0.0	48.3	0.0	0.0	0.0	0.0	2.5	156.2
1974	33.0	10.2	0.0	7.1	0.0	0.0	0.0	0.0	3.3	0.0	0.0	15.2	68.8
1975	195.6	58.4	66.0	2.5	0.0	0.0	0.0	66.0	0.0	0.0	17.8	12.7	419.1
1976	45.7	104.1	391.2	61.0	0.0	25.4	15.2	0.0	15.2	28.7	8.9	36.1	731.5
1977	61.2	55.9	0.0	0.0	5.1	29.5	45.7	30.5	0.0	0.0	1.8	1.3	230.9
1978	7.6	1.3	3.3	2.5	0.0	30.5	86.4	10.2	0.0	0.0	0.0	1.8	143.5
1979	19.6	57.2	37.1	5.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.4	130.3
1980	8.9	6.9	16.3	0.0	0.0	3.3	0.0	0.0	0.0	8.4	1.5	1.0	46.2
1981	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	21.1	48.3	54.6	24.4	13.5	0.0	7.9	68.6	0.0	49.5	0.0	57.7	345.4
1983	18.0	12.2	38.9	36.8	6.4	0.0	14.7	57.7	0.0	0.0	0.0	0.0	184.7
1984	12.7	19.6	31.5	0.0	0.0	0.0	17.8	29.2	0.0	0.0	3.6	63.8	178.1
1985	23.4	0.0	17.8	38.6	0.0	0.0	39.4	15.2	0.0	0.0	0.0	76.2	210.6
1986	17.8	86.4	127.0	12.7	0.0	0.0	43.2	124.0	0.0	0.0	2.5	5.1	418.6
1987	55.9	68.8	53.6	0.0	45.7	22.9	0.0	17.8	0.0	0.8	0.0	0.0	265.4
1988	71.1	86.4	160.0	22.9	0.0	0.0	61.0	0.0	0.0	0.0	0.0	17.8	419.1
1989	87.9	62.7	274.6	18.3	0.0	10.2	64.5	10.2	0.0	0.0	35.6	151.6	715.5
1990	-	-	-	-	-	-	-	-	-	-	-	-	-
1991	163.3	83.6	49.3	59.7	10.9	0.0	0.0	0.0	14.2	0.0	16.3	41.9	439.2
1992	-	-	-	-	-	-	-	-	-	-	-	-	-
1993	-	-	-	-	-	-	-	-	-	-	-	-	-
1994	-	-	-	-	-	-	-	-	-	-	-	-	-
1995	-	-	-	-	-	-	-	-	-	-	-	-	-
Mean	44.4	46.1	68.3	19.6	5.7	6.0	20.6	18.0	1.4	4.0	4.5	25.4	269.0

Table B.1.6 Monthly Rainfall of K.K.Bund Station

(Unit:mm)

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Annual
1961	-	-	-	-	-	-	-	-	-	-	-	-	-
1962	-	-	-	-	-	-	-	-	-	-	-	-	-
1963	-	-	-	-	-	-	-	-	-	-	-	-	-
1964	-	-	-	-	-	-	-	-	-	-	-	-	-
1965	-	-	-	-	-	-	-	-	-	-	-	-	-
1966	-	-	-	-	-	-	-	-	-	-	-	-	-
1967	-	-	-	-	-	-	-	-	-	-	-	-	-
1968	-	-	-	-	-	-	-	-	-	-	-	-	-
1969	-	-	-	-	-	-	-	-	-	-	-	-	-
1970	-	-	-	-	-	-	-	-	-	-	-	-	-
1971	-	-	-	-	-	-	-	-	-	-	-	-	-
1972	-	-	-	-	-	-	-	-	-	-	-	-	-
1973	-	-	-	-	-	-	-	-	-	-	-	-	-
1974	-	-	-	-	-	-	-	-	-	-	-	-	-
1975	-	-	-	-	-	-	-	-	-	-	-	-	-
1976	-	-	-	-	-	-	-	-	-	-	-	-	-
1977	-	-	-	-	-	-	-	-	-	-	-	-	-
1978	-	-	-	-	-	-	-	-	-	-	-	-	-
1979	-	-	-	-	-	-	-	-	-	-	-	-	-
1980	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	9.9	11.7	0.0	0.0	0.0	26.4	-
1989	39.9	30.2	148.1	-	-	0.0	5.8	0.0	0.0	0.0	0.0	52.6	-
1990	150.9	109.2	16.3	23.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	70.1	370.3
1991	270.0	127.5	163.6	37.1	0.0	0.0	0.0	0.0	14.2	0.0	16.3	13.2	641.9
1992	-	-	-	-	-	-	-	-	-	-	-	-	-
1993	105.7	15.2	33.3	18.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	172.2
1994	-	-	-	-	-	-	-	-	-	-	-	-	-
1995	-	-	-	-	-	-	-	-	-	-	-	-	-
Meam	141.6	70.5	90.3	26.3	0.0	0.0	3.1	2.3	2.8	0.0	3.3	32.5	394.8

Table B.1.7   Monthly Rainfall of Qila Abdullah Station

(Unit:mm)

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Annual
1961	-	-	-	-	-	-	-	-	-	-	-	-	-
1962	-	-	-	-	-	-	-	-	-	-	-	-	-
1963	-	-	-	-	-	-	-	-	-	-	-	-	-
1964	-	-	-	-	-	-	-	-	-	-	-	-	-
1965	-	-	-	-	-	-	-	-	-	-	-	-	-
1966	-	-	-	-	-	-	-	-	-	-	-	-	-
1967	-	-	-	-	-	-	-	-	-	-	-	-	-
1968	-	-	-	-	-	-	-	-	-	-	-	-	-
1969	-	-	-	-	-	-	-	-	-	-	-	-	-
1970	-	-	-	-	-	-	-	-	-	-	-	-	-
1971	-	-	-	-	-	-	-	-	-	-	-	-	-
1972	-	-	-	-	-	-	-	-	-	-	-	-	-
1973	-	-	-	-	-	-	-	-	-	-	-	-	-
1974	-	-	-	-	-	-	-	-	-	-	-	-	-
1975	-	-	-	-	-	-	-	-	-	-	-	-	-
1976	-	-	-	-	-	-	-	-	-	-	-	-	-
1977	-	-	-	-	-	-	-	-	-	-	-	-	-
1978	-	-	-	-	-	-	-	-	-	-	-	-	-
1979	-	-	-	-	-	-	-	-	-	-	-	-	-
1980	-	-	-	-	-	-	-	-	-	-	-	-	-
1981	-	-	-	-	-	-	-	-	-	-	-	-	-
1982	-	-	-	-	-	-	-	-	-	-	-	-	-
1983	-	-	-	-	-	-	-	-	-	-	-	-	-
1984	-	-	-	-	-	-	-	-	-	-	-	-	-
1985	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	-	-	-	-
1988	-	-	-	-	-	-	0.0	0.0	0.0	0.0	0.0	82.0	-
1989	29.7	22.9	175.5	-	-	0.0	4.1	0.0	0.0	0.0	0.0	31.8	-
1990	118.9	130.0	22.9	4.3	2.0	0.0	0.0	0.0	0.0	0.0	0.0	63.0	341.1
1991	135.6	89.4	117.3	20.3	0.0	0.0	0.0	0.0	0.0	0.0	3.6	23.9	390.1
1992	-	-	-	-	-	-	-	-	-	-	-	-	-
1993	-	-	-	-	-	-	-	-	-	-	-	-	-
1994	-	-	-	-	-	-	-	-	-	-	-	-	-
1995	-	-	-	-	-	-	-	-	-	-	-	-	-
Mean	94.7	80.8	105.2	12.3	1.0	0.0	1.0	0.0	0.0	0.0	0.9	50.2	365.6

Table B.1.8 Correlation of Daily Rainfall in Each Meteorological Station

Station name	QilaAbdulla	BundKKhan	BandatJung	Kach	KillaKotowi	Mach	Sariab	SiranTangi	Spezand	Surab	WaliTangi
QilaAbdulla	1.00										
BundKKhan	0.57	1.00									
BandatJung	0.39	0.49	1.00								
Kach	0.34	0.34	0.57	1.00							
KillaKotowi	0.73	0.62	0.46	0.37	1.00						
Mach	0.26	0.36	0.08	0.12	0.24	1.00					
Sariab	0.53	0.56	0.41	0.38	0.77	0.33	1.00				
SiranTangi	0.24	0.24	0.45	0.17	0.23	0.19	0.21	1.00			
Spezand	0.66	0.66	0.40	0.40	0.78	0.35	0.77	0.14	1.00		
Surab	0.02	0.00	0.03	0.00	0.01	0.02	0.07	0.00	0.00	1.00	
WaliTangi	0.78	0.66	0.46	0.38	0.92	0.30	0.74	0.23	0.80	0.02	1.00

Note: Daily rainfall in 1991 was adopted for the above analysis.

Distance in Kilometer in Each Meteorological Station (referance)

Station name	QilaAbdulla	BundKKhan	BandatJung	Kach	KillaKotowi	Mach	Sariab	SiranTangi	Spezand	Surab	WaliTangi
QilaAbdulla	0										
BundKKhan	34	0									
BandatJung	78	45	0								
Kach	70	38	13	0							
KillaKotowi	65	46	42	30	0						
Mach	114	93	66	61	50	0					
Sariab	78	63	57	47	18	39	0				
SiranTangi	66	36	20	8	23	57	44	0			
Spezand	91	77	66	57	31	32	13	50	0		
Surab	251	248	242	234	207	181	188	227	178	0	
WaliTangi	79	52	29	21	20	41	30	17	38	214	0

Table B.1.9 Rainfall Records in Short Term Duration

KILLI KOTWAL Station (mm)

Year	1 hour		2 hour		3 hour		6 hour		12 hour		24 hour	
	Winter	Summer	Winter	Summer	Winter	Summer	Winter	Summer	Winter	Summer	Winter	Summer
1970												
1971	5.3	0.0	8.6	0.0	10.2	0.0	11.9	0.0	11.9	0.0	11.9	0.0
1972	7.6	19.6	10.9	19.6	12.2	19.6	18.0	19.6	18.0	19.6	18.0	19.6
1973	4.1	21.6	8.1	35.6	8.1	35.6	11.9	35.6	16.0	35.6	18.3	35.6
1974	8.1	0.8	8.1	0.8	8.6	0.8	15.2	1.0	25.1	1.0	26.9	1.0
1975	9.7	19.1	13.2	33.5	13.5	34.3	20.6	36.1	21.8	44.7	25.7	44.7
1976												
1977												
1978												
1979												
1980												
1981												
1982	7.1	14.5	13.7	20.8	18.8	20.8	31.0	21.8	49.0	22.9	56.4	22.9
1983												
1984												
1985												
1986	19.3	14.7	20.3	28.7	20.3	35.8	20.3	49.0	20.3	69.9	20.6	81.5
1987	13.7	12.2	14.7	22.4	14.7	22.4	17.8	22.4	23.6	22.4	30.5	22.4
1988	7.4	0.0	10.2	0.0	16.5	0.0	25.7	0.0	32.8	0.0	38.1	0.0
1989	6.4	19.1	10.2	31.8	12.7	31.8	15.2	31.8	22.6	31.8	35.1	31.8
1990	8.9	0.0	14.0	0.0	17.8	0.0	22.1	0.0	36.8	0.0	41.9	0.0
1991	11.2	7.6	13.0	7.6	14.0	7.6	20.3	10.2	38.6	14.0	40.6	14.0
1992												
1993												
1994												
1995												

BANDAT JUNGLE Station

Year	1 hour		2 hour		3 hour		6 hour		12 hour		24 hour	
	Winter	Summer	Winter	Summer	Winter	Summer	Winter	Summer	Winter	Summer	Winter	Summer
1969	0.0	21.1	0.0	21.6	0.0	22.4	0.0	22.4	0.0	22.4	0.0	22.4
1970	5.1	16.3	8.9	16.5	12.7	16.5	23.9	16.5	34.3	16.5	49.3	16.5
1971	4.3	0.0	5.6	0.0	7.1	0.0	8.1	0.0	10.9	0.0	11.2	0.0
1972	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1973	9.4	24.1	9.7	24.9	11.2	26.4	19.1	38.1	21.8	38.1	27.7	38.1
1974	7.1	2.5	7.6	3.8	9.1	3.8	12.2	3.8	24.4	3.8	32.5	3.8
1975	6.1	4.1	7.9	6.1	7.9	7.1	10.2	11.2	11.7	13.2	20.1	13.2
1976												
1977												
1978												
1979												
1980												
1981												
1982	7.1	11.2	11.7	16.5	15.7	18.5	27.9	20.3	41.1	26.9	48.0	27.9
1983												
1984												
1985												
1986	7.1	12.7	8.9	14.7	11.7	15.0	18.8	15.5	21.6	31.5	22.1	37.6
1987	2.3	6.1	4.6	6.4	6.1	7.1	9.7	8.9	18.3	8.9	23.4	16.0
1988	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1989	4.8	1.8	7.4	2.8	10.2	3.6	14.5	6.4	28.2	11.9	42.9	12.7
1990	3.0	2.5	5.8	3.8	7.4	5.1	12.4	10.2	21.1	15.2	28.2	10.2
1991	5.8	0.0	7.6	0.0	8.9	0.0	11.7	0.0	19.6	0.0	33.8	0.0
1992												
1993												
1994												
1995												

Table B.1.10   Typical Analysis for Groundwater Recharge (1/5)

January 1988

Item	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Rainfall																															

February 1988

March 1988

April 1988

May 1988

June 1988

July 1988

August 1988

September 1988

October 1988

November 1988

December 1988

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Table B.1.10   Typical Analysis for Groundwater Recharge (2/5)

January 1989   Rain Kilalatyat

Item	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Rainfall																															
Dis (cum)																															
Excess Rain																															
ETo (mm)																															
Soil moist																															
Actual ET																															
Recharge																															

February 1989

March 1989

April 1989

May 1989

June 1989

July 1989

August 1989

September 1989

October 1989

November 1989

December 1989

Table B.1.10 Typical Analysis for Groundwater Recharge (3/5)

January 1990 — Rain(0/Rainfall)

Item	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Rainfall	0.00	0.00	19.54	3.56	3.54	23.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.04	1.02	11.43	10.16	10.67	4.57	0.00	0.00	0.00	0.00	0.00	0.00	0.91	13.72	9.65	125.22
Dis (mm)	0.00	0.00	0.98	0.18	0.33	1.47	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.05	0.57	0.51	0.53	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.69	0.48	6.26
Excess Rain	0.00	0.00	18.58	3.38	2.41	22.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.33	0.97	10.56	9.65	10.13	4.34	0.00	0.00	0.00	0.00	0.00	0.00	9.41	13.03	9.17	118.96
ETo (mm)	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	52.4
Soil m cont	30.00	28.99	27.97	30.00	30.00	30.00	30.00	26.99	27.97	26.96	25.94	24.93	23.92	32.90	21.69	29.67	24.59	24.54	30.00	30.00	30.00	30.00	28.99	27.97	26.96	25.94	24.93	23.92	22.90	30.00	30.00	30.00	
Actual ET	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	31.43
Recharge	0.00	0.00	15.54	2.36	1.40	21.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.18	0.54	9.12	3.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.35	12.67	8.16	87.53

February 1990

Item	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Rainfall	0.00	0.00	0.00	0.00	12.70	21.59	7.62	3.81	0.00	0.00	3.30	27.94	3.81	0.00	0.00	0.00	39.57	3.81	0.00	0.00	0.00	0.00	0.00	3.05	0.00	3.30	0.00	0.00	0.00	0.00	0.00	140.30
Dis (mm)	0.00	0.00	0.00	0.00	1.94	2.02	1.30	0.46	0.23	0.00	0.00	2.36	0.23	0.00	0.00	0.00	2.36	0.58	0.00	0.00	0.00	0.00	0.00	2.47	0.00	3.10	0.00	0.00	0.00			7.82
Excess Rain	0.00	0.00	0.00	0.00	11.94	20.29	7.16	3.58	0.00	0.00	3.10	26.26	3.58	0.00	0.00	0.00	37.01	3.58	0.00	0.00	0.00	0.00	0.00	2.47	0.00	3.10	0.00	0.00	0.00			132.45
ETo (mm)	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28				66.1
Soil m cont	30.00	28.63	27.26	25.90	24.53	30.00	30.00	30.00	30.00	28.63	27.26	29.00	30.00	30.00	30.00	28.63	27.26	25.90	30.00	30.00	28.63	27.26	25.90	24.53	23.16	24.66	23.29	25.05	23.66	22.29	20.92	
Actual ET	1.37	1.37	1.37	1.37	1.37	1.37	1.37	1.37	1.37	1.37	1.37	1.37	1.37	1.37	1.37	1.37	1.37	1.37	1.37	1.37	1.37	1.37	1.37	1.37	1.37	1.37	1.37	1.37				39.62
Recharge	0.00	0.00	0.00	0.00	5.10	18.93	5.79	2.21	0.00	0.00	23.90	2.21	0.00	0.00	0.00	31.54	2.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				91.32

March 1990

Item	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Rainfall	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.83	19.67	0.00	0.00	0.00	0.00	11.19	0.00	13.16	0.00	0.00	40.13
Dis (mm)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.34	0.75	0.00	0.00	0.00	0.00	0.78	0.00	0.94	0.00	0.00	2.61
Excess Rain	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.49	9.92	0.00	0.00	0.00	0.00	10.39	0.00	12.52	0.00	0.00	37.32
ETo (mm)	3.41	3.41	3.41	3.41	3.41	3.41	3.41	3.41	3.41	3.41	3.41	3.41	3.41	3.41	3.41	3.41	3.41	3.41	3.41	3.41	3.41	3.41	3.41	3.41	3.41	3.41	3.41	3.41	3.41	3.41	105.7
Soil m cont	20.92	18.88	16.83	14.78	12.74	10.69	8.65	6.50	4.55	2.51	0.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.44	10.32	3.27	6.23	4.13	2.13	10.45	8.44	18.91	16.56	14.82	
Actual ET	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	0.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	43.43
Recharge	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

April 1990

Item	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Rainfall	0.00	0.00	0.00	0.00	0.00	2.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.16		2.03
Dis (mm)	0.00	0.00	0.00	0.00	0.00	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.16
Excess Rain	0.00	0.00	0.00	0.00	0.00	1.87	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		1.87
ETo (mm)	4.74	4.74	4.74	4.74	4.74	4.74	4.74	4.74	4.74	4.74	4.74	4.74	4.74	4.74	4.74	4.74	4.74	4.74	4.74	4.74	4.74	4.74	4.74	4.74	4.74	4.74	4.74	4.74	4.74	4.74		142.2
Soil m cont	14.82	11.97	9.13	6.28	3.44	0.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Actual ET	2.84	2.84	2.84	2.84	2.84	2.47	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		16.69
Recharge	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00

May 1990

Item	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Rainfall	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dis (mm)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Excess Rain	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ETo (mm)	5.90	5.90	5.90	5.90	5.90	5.90	5.90	5.90	5.90	5.90	5.90	5.90	5.90	5.90	5.90	5.90	5.90	5.90	5.90	5.90	5.90	5.90	5.90	5.90	5.90	5.90	5.90	5.90	5.90	5.90	5.90	182.9
Soil m cont	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Actual ET	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Recharge	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

June 1990

Item	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Rainfall	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
Dis (mm)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
Excess Rain	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
ETo (mm)	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00		210.0
Soil m cont	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Actual ET	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
Recharge	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00

July 1990

Item	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Rainfall	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dis (mm)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Excess Rain	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ETo (mm)	7.31	7.31	7.31	7.31	7.31	7.31	7.31	7.31	7.31	7.31	7.31	7.31	7.31	7.31	7.31	7.31	7.31	7.31	7.31	7.31	7.31	7.31	7.31	7.31	7.31	7.31	7.31	7.31	7.31	7.31	7.31	226.6
Soil m cont	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Actual ET	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Recharge	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

August 1990

Item	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Rainfall	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dis (mm)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Excess Rain	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ETo (mm)	6.24	6.24	6.24	6.24	6.24	6.24	6.24	6.24	6.24	6.24	6.24	6.24	6.24	6.24	6.24	6.24	6.24	6.24	6.24	6.24	6.24	6.24	6.24	6.24	6.24	6.24	6.24	6.24	6.24	6.24	6.24	193.4
Soil m cont	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Actual ET	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Recharge	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

September 1990

Item	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Rainfall	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
Dis (mm)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
Excess Rain	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
ETo (mm)	4.79	4.79	4.79	4.79	4.79	4.79	4.79	4.79	4.79	4.79	4.79	4.79	4.79	4.79	4.79	4.79	4.79	4.79	4.79	4.79	4.79	4.79	4.79	4.79	4.79	4.79	4.79	4.79	4.79	4.79		143.7
Soil m cont	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Actual ET	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
Recharge	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00

October 1990

Item	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Rainfall	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dis (mm)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Excess Rain	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ETo (mm)	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35	103.9
Soil m cont	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Actual ET	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Recharge	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

November 1990

Item	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Rainfall	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
Dis (mm)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
Excess Rain	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
ETo (mm)	2.44	2.44	2.44	2.44	2.44	2.44	2.44	2.44	2.44	2.44	2.44	2.44	2.44	2.44	2.44	2.44	2.44	2.44	2.45	2.44	2.44	2.44	2.44	2.44	2.44	2.44	2.44	2.44	2.44	2.44		73.2
Soil m cont	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Actual ET	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
Recharge	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00

December 1990

Item	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Rainfall	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.54	4.06	0.00	9.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.79	0.00	1.27	1.52	0.00	6.40	0.00	7.11	37.34
Dis (mm)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.20	0.00	0.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.00	0.06	0.06	0.00	0.31	0.00	0.36	1.67
Excess Rain	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.41	3.86	0.00	8.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.65	0.00	1.21	1.45	0.00	6.27	0.00	6.76	2.17
ETo (mm)	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	50.5
Soil m cont	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.44	4.32	3.34	11.05	10.07	9.09	8.11	7.14	6.16	5.18	4.51	6.58	5.60	5.50	10.99	9.92	15.76	16.89	15.91	14.95	
Actual ET	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.38	0.98	1.05	0.98	0.95	0.95	0.76	0.98	0.98	0.98	0.95	0.98	0.98	1.05	0.98	0.98	0.95	0.98	0.95	0.98	20.54
Recharge	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.91	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

	Winter				Spring				Summer				
	Rain	Disc	Excess	Rech'g	Rain	Disc	Excess	Rech'g	Rain	Disc	Excess	Rech'g	Annual Excess Recharge
	335.8	16.9	151.8	179.4	0.0	0.0	0.0	0.0	335.0	16.9	151.8	179.4	
	100%	5%	45%	53%	100%	0%	0%	0%	100%	5%	45%	53%	

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Table B.1.10 Typical Analysis for Groundwater Recharge (4/5)

January,1991 Rain:Kitalotwal

Item		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Rainfall		0.00	0.00	0.00	0.00	0.00	5.33	18.54	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.35	0.00	0.00	0.00	0.00	0.00	0.00	1.02	0.00	12.70	11.94	0.00	22.35	0.00	0.00	0.00	78.23
Dis (mm)		0.00	0.00	0.00	0.00	0.00	0.27	0.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.64	0.60	0.00	1.12	0.00	0.00	0.00	3.91
Excess Rain		0.00	0.00	0.00	0.00	0.00	5.07	17.61	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.03	0.00	0.00	0.00	0.00	0.00	0.00	0.97	0.00	12.07	11.34	0.00	21.23	0.00	0.00	0.00	74.32
ETo (mm)		1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	1.69	52.4
Soil m cont.	30.00	28.99	27.97	26.96	25.94	24.93	28.98	30.00	28.99	27.97	26.96	25.94	24.93	23.92	22.90	21.89	26.91	25.89	24.88	23.86	22.85	21.84	20.82	20.77	19.76	30.00	30.00	28.99	30.00	28.99	27.97	26.96	
Actual ET		1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	31.43
Recharge		0.00	0.00	0.00	0.00	0.00	0.00	15.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.81	10.33	0.00	19.21	0.00	0.00	0.00	45.93

February,1991

Item		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Rainfall		0.00	2.54	1.27	0.00	0.00	1.27	1.27	6.35	13.97	28.70	6.35	0.00	0.00	4.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.79	3.30	0.00	0.00	0.00	0.00	0.00	0.00	72.39
Dis (mm)		0.00	0.15	0.08	0.00	0.00	0.08	0.08	0.38	0.84	1.72	0.38	0.00	0.00	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.20	0.00	0.00	0.00	0.00			4.34
Excess Rain		0.00	2.39	1.19	0.00	0.00	1.19	1.19	5.97	13.13	26.98	5.97	0.00	0.00	4.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.63	3.10	0.00	0.00	0.00	0.00			68.05
ETo (mm)		2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28	2.28			66.1
Soil m cont.	26.96	25.59	26.61	26.44	25.07	23.70	23.53	23.35	27.95	30.00	30.00	30.00	28.63	27.26	30.00	28.63	27.26	25.90	24.53	23.16	21.79	20.42	19.06	17.69	18.95	20.68	19.31	17.95	16.58	15.21			
Actual ET		1.37	1.37	1.37	1.37	1.37	1.37	1.37	1.37	1.37	1.37	1.37	1.37	1.37	1.37	1.37	1.37	1.37	1.37	1.37	1.37	1.37	1.37	1.37	1.37	1.37	1.37	1.37	1.37	1.37			39.67
Recharge		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.72	25.61	4.60	0.00	0.00	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			40.12

March,1991

Item		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Rainfall		0.00	40.64	2.54	9.65	0.00	0.00	0.00	10.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.27	11.43	16.76	0.00	0.00	0.00	6.35	0.00	0.00	0.00	0.00	0.00	0.00	2.03	0.00	0.00	100.83
Dis (mm)		0.00	2.84	0.18	0.68	0.00	0.00	0.00	0.71	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.80	1.17	0.00	0.00	0.00	0.44	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.00	0.00	7.06
Excess Rain		0.00	37.80	2.36	8.98	0.00	0.00	0.00	9.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.18	10.63	15.59	0.00	0.00	0.00	5.91	0.00	0.00	0.00	0.00	0.00	0.00	1.89	0.00	0.00	93.78
ETo (mm)		3.41	3.41	3.41	3.41	3.41	3.41	3.41	3.41	3.41	3.41	3.41	3.41	3.41	3.41	3.41	3.41	3.41	3.41	3.41	3.41	3.41	3.41	3.41	3.41	3.41	3.41	3.41	3.41	3.41	3.41	3.41	105.7
Soil m cont.	15.21	13.16	30.00	30.00	30.00	27.95	25.91	23.86	30.00	27.95	25.91	23.86	21.82	19.77	17.72	15.68	14.81	23.40	30.00	27.95	25.91	23.86	27.72	25.68	23.63	21.58	19.54	17.49	15.45	15.29	13.24	11.20	
Actual ET		2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	2.05	63.43
Recharge		0.00	18.91	0.32	6.93	0.00	0.00	0.00	1.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	34.37

April,1991

Item		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Rainfall		8.89	1.27	0.76	0.00	0.00	0.00	0.00	10.16	0.00	0.00	0.00	20.83	0.00	8.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	50.04
Dis (mm)		0.71	0.10	0.06	0.00	0.00	0.00	0.00	0.81	0.00	0.00	0.00	1.67	0.00	0.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		4.00
Excess Rain		8.18	1.17	0.70	0.00	0.00	0.00	0.00	9.35	0.00	0.00	0.00	19.16	0.00	7.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		46.03
ETo (mm)		4.74	4.74	4.74	4.74	4.74	4.74	4.74	4.74	4.74	4.74	4.74	4.74	4.74	4.74	4.74	4.74	4.74	4.74	4.74	4.74	4.74	4.74	4.74	4.74	4.74	4.74	4.74	4.74	4.74	4.74		142.2
Soil m cont.	11.20	16.53	14.86	12.71	9.87	7.03	4.18	1.34	7.84	5.00	2.15	0.00	16.32	13.47	18.11	15.26	12.42	9.58	6.73	3.89	1.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Actual ET		2.84	2.84	2.84	2.84	2.84	2.84	2.84	2.84	2.84	2.84	2.15	2.84	2.84	2.84	2.84	2.84	2.84	2.84	2.84	2.84	1.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		57.23
Recharge		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00

May,1991

Item		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Rainfall		1.27	0.00	0.00	0.00	4.32	2.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.62	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	15.24
Dis (mm)		0.11	0.00	0.00	0.00	0.39	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.37
Excess Rain		1.16	0.00	0.00	0.00	3.93	1.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.87
ETo (mm)		5.90	5.90	5.90	5.90	5.90	5.90	5.90	5.90	5.90	5.90	5.90	5.90	5.90	5.90	5.90	5.90	5.90	5.90	5.90	5.90	5.90	5.90	5.90	5.90	5.90	5.90	5.90	5.90	5.90	5.90	5.90	182.9
Soil m cont.	0.00	0.00	0.00	0.00	0.00	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Actual ET		1.16	0.00	0.00	0.00	3.54	2.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.54	3.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.87
Recharge		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

June,1991

Item		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Rainfall		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dis (mm)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
Excess Rain		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
ETo (mm)		7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00		210.0
Soil m cont.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Actual ET		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
Recharge		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00

July,1991

Item		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Rainfall		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dis (mm)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Excess Rain		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ETo (mm)		7.31	7.31	7.31	7.31	7.31	7.31	7.31	7.31	7.31	7.31	7.31	7.31	7.31	7.31	7.31	7.31	7.31	7.31	7.31	7.31	7.31	7.31	7.31	7.31	7.31	7.31	7.31	7.31	7.31	7.31	7.31	226.6
Soil m cont.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Actual ET		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Recharge		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

August,1991

Item		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Rainfall		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dis (mm)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Excess Rain		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ETo (mm)		6.24	6.24	6.24	6.24	6.24	6.24	6.24	6.24	6.24	6.24	6.24	6.24	6.24	6.24	6.24	6.24	6.24	6.24	6.24	6.24	6.24	6.24	6.24	6.24	6.24	6.24	6.24	6.24	6.24	6.24	6.24	193.4
Soil m cont.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Actual ET		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Recharge		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

September,1991

Item		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Rainfall		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.81	10.16	0.00	0.00	0.00	13.97
Dis (mm)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.46	1.22	0.00	0.00		1.68
Excess Rain		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.35	8.94	0.00	0.00		12.29
ETo (mm)		4.79	4.79	4.79	4.79	4.79	4.79	4.79	4.79	4.79	4.79	4.79	4.79	4.79	4.79	4.79	4.79	4.79	4.79	4.79	4.79	4.79	4.79	4.79	4.79	4.79	4.79	4.79	4.79	4.79	4.79		143.7
Soil m cont.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.48	6.55	3.67	0.80		
Actual ET		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.87	2.87	2.87	2.87		11.50
Recharge		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00

October,1991

Item		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Rainfall		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dis (mm)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Excess Rain		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ETo (mm)		3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35	103.8
Soil m cont.	0.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Actual ET		0.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.80
Recharge		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

November,1991

Item		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Rainfall		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.62	1.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.89
Dis (mm)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.61	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.71
Excess Rain		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.01	1.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		8.18
ETo (mm)		2.44	2.44	2.44	2.44	2.44	2.44	2.44	2.44	2.44	2.44	2.44	2.44	2.44	2.44	2.44	2.44	2.44	2.44	2.44	2.44	2.44	2.44	2.44	2.44	2.44	2.44	2.44	2.44	2.44	2.44		73.2
Soil m cont.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.55	5.25	3.79	2.32	0.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Actual ET		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.46	1.46	1.46	1.46	1.46	0.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		8.18
Recharge		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00

December,1991

Item		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Rainfall		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	18.29	0.00	4.32	6.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	28.96
Dis (mm)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.91	0.00	0.22	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.45
Excess Rain		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	17.37	0.00	4.10	6.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	27.51
ETo (mm)		1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	50.5
Soil m cont.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16.40	15.42	18.54	23.60	22.62	21.64	20.66	19.68	18.71	17.73	16.75	
Actual ET		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	10.76
Recharge		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Winter				Summer				Whole year			
Rain	Disc-g	Evap	Rechg	Rain	Disc-g	Evap	Rechg	Rain	Disc-g	Evap	Rechg
339.3	21.5	210.7	120.4	29.2	3.0	26.2	0.0	368.6	24.5	236.9	120.4
100%	6%	62%	35%	100%	10%	90%	0%	100%	7%	64%	33%

Assumption: Evap = ETo x 0.6

Table B.1.10   Typical Analysis for Groundwater Recharge (5/5)

January, 1993 — Rain K7g/ufa

Item	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Rainfall																															
Dis (mm)																															
Excess Rain																															
ETo (mm)																															
Soil moist																															
Actual ET																															
Recharge																															

February, 1993

March, 1993

April, 1993

May, 1993

June, 1993

July, 1993

August, 1993

September, 1993

October, 1993

November, 1993

December, 1993

Table B.2.1 Results of Water Quality Test

District	Dam	Water Source	pH	EC (µS)	TDS (ppm)	SAR (%)	BOD (ppm)	COD (ppm)	Cl- (ppm)	NO2- (ppm)	NO3- (ppm)	NH4+ (ppm)	E Coli	Common Bacilus	SS (ppm)	Temp C
Quetta	Wali Dad-1	TW	7.4	250	140	2.28	0.8	1.8	30.5	0.00	15.31	0.55	9	Nil	70.0	19.5
	Wali Dad-2	TW	7.5	641	400	1.64	2.4	4.1	30.5	0.00	16.41	1.01	92	Nil	60.0	20.0
	Wali Dad-3	TW	7.2	280	160	2.07	1.9	3.7	20.2	0.00	14.88	0.62	161	Nil	70.0	20.0
	Wali Dad-4	TW	7.3	701	440	2.92	1.2	3.9	40.7	0.00	25.38	0.54	161	Nil	60.0	21.0
	Wali Dad-5	PP	7.2	295	170	1.55	1.9	1.7	20.5	0.00	29.97	0.39	161	Nil	65.0	24.0
	Brewery-1	SP	7.3	370	220	1.31	0.9	0.4	13.5	4.57	27.34	0.16	161	Nil	140.0	20.0
	Brewery-2	PP	7.2	219	120	0.54	1.1	0.5	10.3	0.00	24.50	0.31	161	Nil	65.0	20.6
	Brewery-3	PP	7.6	204	110	0.37	1.2	0.3	13.5	0.91	16.41	0.39	9	Nil	65.0	19.5
	Brewery-4	SW	7.2	2703	1770	6.53	1.8	3.9	299.1	1.92	25.16	1.74	161	Nil	75.0	20.0
	Brewery-5	TW	7.3	355	210	1.84	1.5	1.3	23.7	6.09	24.06	0.19	10	Nil	65.0	19.5
	Ghulai Shela-1	TW	7.2	400	240	7.76	1.9	2.5	40.7	0.00	24.50	0.39	151	Nil	80.0	19.0
	Ghulai Shela-2	PP	7.3	912	550	2.11	2.4	4.2	34.0	1.52	31.72	0.23	5	Nil	90.0	20.4
	Ghulai Shela-3	TW	7.2	3084	2010	1.39	2.0	8.5	288.9	0.00	24.06	0.47	10	Nil	10.0	19.0
	Ghulai Shela-4	SW	7.4	3410	2240	10.30	2.5	5.9	275.4	0.91	23.19	0.16	54	Nil	35.0	20.0
	Ghulai Shela-5	TW	7.2	310	180	1.67	1.5	1.9	27.3	0.00	22.75	0.47	450	Nil	60.0	22.0
	Dara-1	TW	7.2	450	280	5.65	1.1	3.6	34.0	0.91	25.16	0.39	161	Nil	75.0	27.0
	Dara-2	TW	7.6	1198	770	10.96	3.0	2.4	60.9	0.91	14.22	0.66	2	Nil	15.0	27.0
	Dara-3	TW	7.3	189	100	7.45	1.7	1.9	54.2	1.52	23.41	0.47	5	Nil	35.0	27.0
	Dara-4	TW	7.4	551	340	7.34	0.8	1.8	47.5	0.00	27.34	0.35	10	Nil	30.0	27.0
	Dara-5	TW	7.2	265	150	7.21	1.5	0.9	23.7	1.83	24.06	0.58	8	Nil	40.0	27.0
	Kach-1	KZ	7.2	510	180	1.39	1.3	0.6	20.2	0.61	25.81	0.62	161	Nil	25.0	30.0
	Kach-2	TW	7.4	370	220	8.36	1.1	0.5	23.7	0.00	20.78	0.43	100	Nil	35.0	28.0
	Kach-3	SP	7.0	189	100	0.76	1.5	0.4	17.0	1.52	22.97	0.62	460	Nil	25.0	30.0
	Kach-4	TW	7.3	475	290	6.60	2.9	2.5	37.2	2.43	23.41	0.58	92	Nil	35.0	26.0
	Kach-5	TW	7.3	445	270	7.06	1.6	0.6	30.5	3.04	24.50	0.54	5	Nil	30.0	22.0
	Murgi Kotal-1	TW	7.3	445	270	5.27	1.3	4.2	23.7	0.00	25.16	0.70	161	Nil	60.0	19.5
	Murgi Kotal-2	SW	7.3	1273	820	16.35	0.9	2.8	51.0	0.00	12.03	0.43	161	Nil	25.0	19.0
	Murgi Kotal-3	SW	7.3	400	240	8.74	1.4	3.0	54.2	1.22	15.59	0.43	160	Nil	40.0	22.0
	Murgi Kotal-4	TW	7.2	325	190	18.73	3.2	1.0	30.5	1.22	9.84	0.74	460	Nil	25.0	20.0
	Murgi Kotal-5	TW	7.2	430	280	12.22	1.8	0.5	40.7	0.91	9.84	0.58	54	Nil	20.0	21.0
	Khora Manda-1	TW	7.4	776	490	8.35	1.5	0.7	47.5	1.52	13.13	0.31	161	Nil	15.0	30.0
	Khora Manda-2	KZ	7.3	806	510	8.30	1.7	3.3	30.5	2.43	14.22	0.35	54	Nil	30.0	30.0
	Khora Manda-3	TW	7.2	1922	1251	24.10	2.7	3.9	275.1	1.52	9.84	0.47	3	Nil	20.0	27.0
	Khora Manda-4	TW	7.3	2281	1490	9.06	1.2	5.3	336.4	1.83	10.94	0.93	460	Nil	40.0	28.0
	Marium-1	SW	7.3	144	70	3.27	2.0	0.6	8.5	1.22	15.31	0.39	161	Nil	40.0	15.0
	Marium-2	SW	7.3	235	130	5.68	1.2	3.5	23.7	2.43	10.94	0.23	161	Nil	30.0	15.5
	Marium-3	SW	7.3	235	150	1.62	1.3	0.4	7.3	1.83	14.22	0.55	161	Nil	35.0	15.0
	Marium-4	SW	7.3	159	80	5.80	0.9	4.1	8.5	0.91	13.19	0.19	161	Nil	40.0	15.5
Pishin	Sanzali-1	TW	7.4	806	510	7.60	0.9	1.7	57.7	2.74	27.34	0.43	54	Nil	45.0	24.0
	Sanzali-2	TW	7.2	716	450	4.82	0.8	2.8	68.0	1.98	20.13	0.51	161	Nil	25.0	23.0
	Sanzali-3	TW	7.2	641	490	7.03	1.3	2.4	64.5	1.83	27.34	0.62	21	Nil	45.0	23.0
	Sanzali-4	TW	7.4	1122	720	11.82	1.0	2.8	85.0	1.83	20.78	0.47	1	Nil	25.0	22.0
	Sanzali-5	TW	7.2	1559	1010	14.20	1.3	1.9	159.7	2.43	16.41	0.35	7	Nil	15.0	22.0
	Tirkha-1	TW	7.5	837	530	11.52	1.1	3.8	115.7	2.43	22.97	0.47	5	Nil	70.0	29.0
	Tirkha-2	TW	7.4	1875	1220	7.49	2.2	5.2	265.2	1.98	29.55	0.58	22	Nil	65.0	26.0
	Tirkha-3	TW	7.3	837	530	12.52	1.2	2.7	102.0	1.22	25.16	0.66	54	Nil	15.0	27.0
	Bostan-1	TW	7.1	219	120	5.09	2.5	0.9	30.8	1.49	22.97	0.51	2	Nil	45.0	19.0
	Bostan-2	TW	7.3	1138	730	6.47	1.7	2.3	61.2	1.83	19.69	0.62	2	Nil	30.0	19.0
	Bostan-3	TW	7.3	927	590	10.68	0.8	3.0	28.2	2.13	26.25	0.58	92	Nil	30.0	19.0
	Khushab-1	TW	7.7	1122	720	3.70	0.9	2.4	71.2	2.43	15.31	0.39	161	Nil	45.0	17.0
	Khushab-2	KZ	7.3	806	510	11.56	1.1	1.3	61.0	2.74	16.19	0.27	35	Nil	30.0	17.0
	Khushab-3	KZ	7.3	837	530	25.60	0.8	2.9	54.2	3.65	14.22	0.27	161	Nil	55.0	17.0
	Khushab-4	TW	7.4	475	280	1.39	3.1	1.8	47.5	2.13	13.13	0.23	161	Nil	35.0	17.0
	Jigda-1	SW	7.6	566	350	6.71	1.6	1.8	37.2	1.22	16.41	0.66	161	Nil	65.0	19.0
	Jigda-2	SW	7.6	921	590	7.96	1.1	1.5	44.2	0.91	15.31	0.54	161	Nil	50.0	19.5
	Jigda-3	TW	7.5	716	450	1.27	0.9	1.9	54.5	1.52	14.22	0.39	161	Nil	60.0	19.0
	Jigda-4	TW	7.4	430	260	1.31	2.6	1.7	37.5	3.04	17.50	0.31	92	Nil	60.0	19.0
	Jigda-5	TW	7.3	490	300	26.19	0.8	2.2	51.9	2.13	16.59	0.31	161	Nil	65.0	19.0
O Abdullah	Arambi-1	SP	7.2	260	160	0.76	1.9	2.2	10.3	0.00	28.53	0.31	460	Nil	95.0	16.0
	Arambi-2	TW	7.4	520	320	1.72	2.0	2.6	30.5	0.00	8.75	0.62	5	Nil	95.0	19.0
	Arambi-3	SW	7.2	295	170	0.94	2.2	2.4	13.5	0.00	14.22	0.70	450	Nil	95.0	15.0
	Arambi-4	TW	7.2	265	150	1.25	2.0	1.8	10.3	0.00	10.94	0.74	Nil	Nil	100.0	18.5
	Arambi-5	KZ	7.3	219	120	1.00	1.5	2.0	10.0	0.00	22.97	1.17	1	Nil	175.0	16.0
Mastung	Sakhot-1	TW	7.2	731	460	6.11	1.2	2.7	71.2	0.76	17.94	0.47	161	Nil	65.0	27.0
	Sakhot-2	KZ	7.3	370	220	1.10	1.6	1.8	30.5	0.91	18.81	0.62	460	Nil	35.0	27.0
	Sakhot-3	SW	7.3	1378	890	2.29	1.4	3.7	152.9	3.65	12.03	0.27	3	Nil	55.0	27.0
	Sakhot-4	SW	7.5	1303	840	2.38	1.7	3.8	132.4	0.00	9.84	0.23	54	Nil	130.0	27.0
	Sakhot-5	SW	7.7	1770	1150	3.75	2.0	4.2	166.4	0.00	17.06	0.35	460	Nil	135.0	27.0
	Amach-1	KZ	7.3	280	160	1.63	1.6	2.0	20.2	1.52	20.78	0.39	460	Nil	30.0	18.0
	Amach-2	TW	7.2	430	260	4.52	2.3	6.5	44.2	0.91	17.06	0.31	161	Nil	60.0	21.0
	Amach-3	TW	7.2	265	150	1.24	1.5	5.1	23.7	0.91	25.16	0.54	161	Nil	70.0	18.0
	Mangi-1	TW	7.6	1062	680	5.63	1.2	2.2	77.9	2.43	14.22	0.74	161	Nil	45.0	25.0
	Mangi-2	TW	7.4	957	610	5.84	1.7	1.5	81.5	0.91	12.03	0.39	54	Nil	45.0	23.0
	Mangi-3	TW	7.2	1273	820	3.06	1.6	3.9	122.2	0.91	11.81	0.62	161	Nil	55.0	23.0
	Mangi-4	TW	7.6	1032	660	6.58	1.6	2.6	135.9	1.83	16.41	0.51	161	Nil	30.0	22.0
	Mangi-5	TW	7.3	204	110	7.20	1.4	0.8	125.7	1.22	10.94	0.43	460	Nil	25.0	22.0
	Mangi-6	TW	7.2	1017	650	4.89	1.4	2.8	129.2	3.65	17.50	0.21	161	Nil	25.0	21.0
	Mangi-7	TW	7.2	1107	710	4.48	1.8	2.5	74.7	1.07	11.81	0.66	161	Nil	50.0	21.0
	Mangi-8	TW	7.4	746	470	6.13	1.8	1.8	122.2	0.91	16.41	0.74	161	Nil	65.0	22.0
	Mangi-9	TW	7.2	716	450	4.84	2.1	2.0	125.7	2.13	14.22	0.35	161	Nil	15.0	21.5
	Kad Kocha II-1	TW	7.2	235	130	1.95	2.0	1.3	23.7	0.91	12.03	0.62	3	Nil	15.0	21.0
	Kad Kocha II-2	TW	7.3	265	150	1.71	1.7	0.4	23.7	0.00	16.41	0.47	1	Nil	30.0	22.0
	Kad Kocha II-3	TW	7.2	581	350	6.00	0.9	1.7	57.7	1.52	15.31	0.43	161	Nil	30.0	20.0
	Kad Kocha II-4	TW	7.4	265	150	1.32	1.6	1.2	27.0	0.00	10.94	0.58	161	Nil	30.0	21.0
	Kad Kocha II-5	TW	7.2	295	170	1.06	2.5	0.8	37.2	0.91	25.16	0.31	161	Nil	30.0	21.0
	Kad Kocha I-1	TW	7.2	250	140	4.25	1.9	0.9	23.7	2.13	9.84	0.43	161	Nil	20.0	22.0
	Kad Kocha I-2	TW	7.3	280	160	7.52	1.8	0.3	37.2	2.43	13.13	0.47	7	Nil	45.0	21.0
	Kad Kocha I-3	TW	7.3	265	150	1.70	1.3	0.4	30.5	2.74	15.31	0.47	22	Nil	25.0	21.0
Kelat	Iskalkoo-1	SP	7.3	280	160	0.83	1.6	2.0	20.2	1.52	20.78	0.39	460	Nil	30.0	15.0
	Iskalkoo-2	SW	7.2	430	280	0.82	2.3	0.5	44.2	0.91	17.06	0.31	161	Nil	60.0	16.0
	Iskalkoo-3	SP	7.2	265	150	1.04	1.5	3.1	23.7	0.91	25.16	0.54	161	Nil	70.0	15.0
	Iskalkoo-4	SW	7.2	400	240	6.08	1.4	2.9	54.2	0.00	12.69	0.93	161	Nil	14.0	16.0
	Iskalkoo-5	SP	7.2	385	230	1.54	1.4	3.3	30.5	0.00	17.06	0.89	143	Nil	60.0	15.0
	Gorpad-1	SP	7.3	4765	3140	51.20	0.6	6.9	669.5	0.00	11.38	0.97	11	Nil	50.0	28.0
	Gorpad-2	SP	7.1	2251	1470	12.14	1.1	1.1	285.4	0.00	11.81	0.62	12	Nil	105.0	28.0
	Gorpad-3	SP	7.2	1484	960	3.82	1.6	5.5	197.2	0.00	16.63	0.89	10	Nil	50.0	25.0
	Laghmgir-1	TW	7.6	566	350	1.59	1.2	1.4	64.5	0.91	16.41	0.70	5	Nil	45.0	18.5
	Laghmgir-2	TW	7.7	1047	670	2.63	1.8	0.5	71.2	6.09	10.94	0.74	161	Nil	35.0	18.5
	Laghmgir-3	TW	7.6	892	560	2.64	1.5	2.0	71.2	0.91	13.19	0.55	161	Nil	35.0	20.0
	Laghmgir-4	TW	7.4	666	430	7.83	1.3	2.3	74.7	0.61	17.50	0.62	22	Nil	25.0	19.0

Notes: TW=Tube well, SW=Shallow well, KZ = Karez, SP=Spring, PP=Pipe

Fig. B.1.1 Climatic Stations Concerned in the Study Area
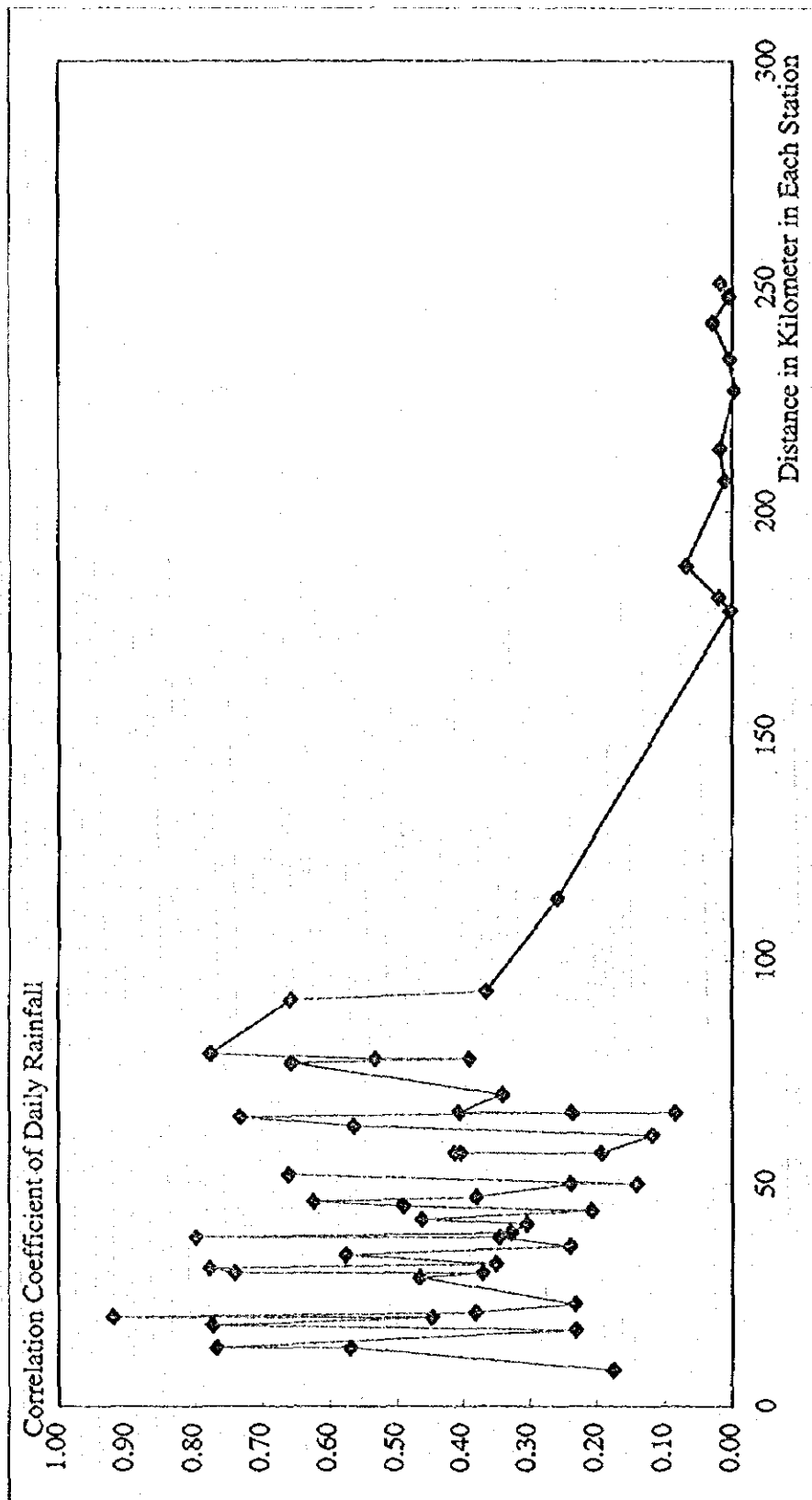
Fig. B.1.2 Correlation Relation between Distance and Correlation Coefficient of Daily Rainfall
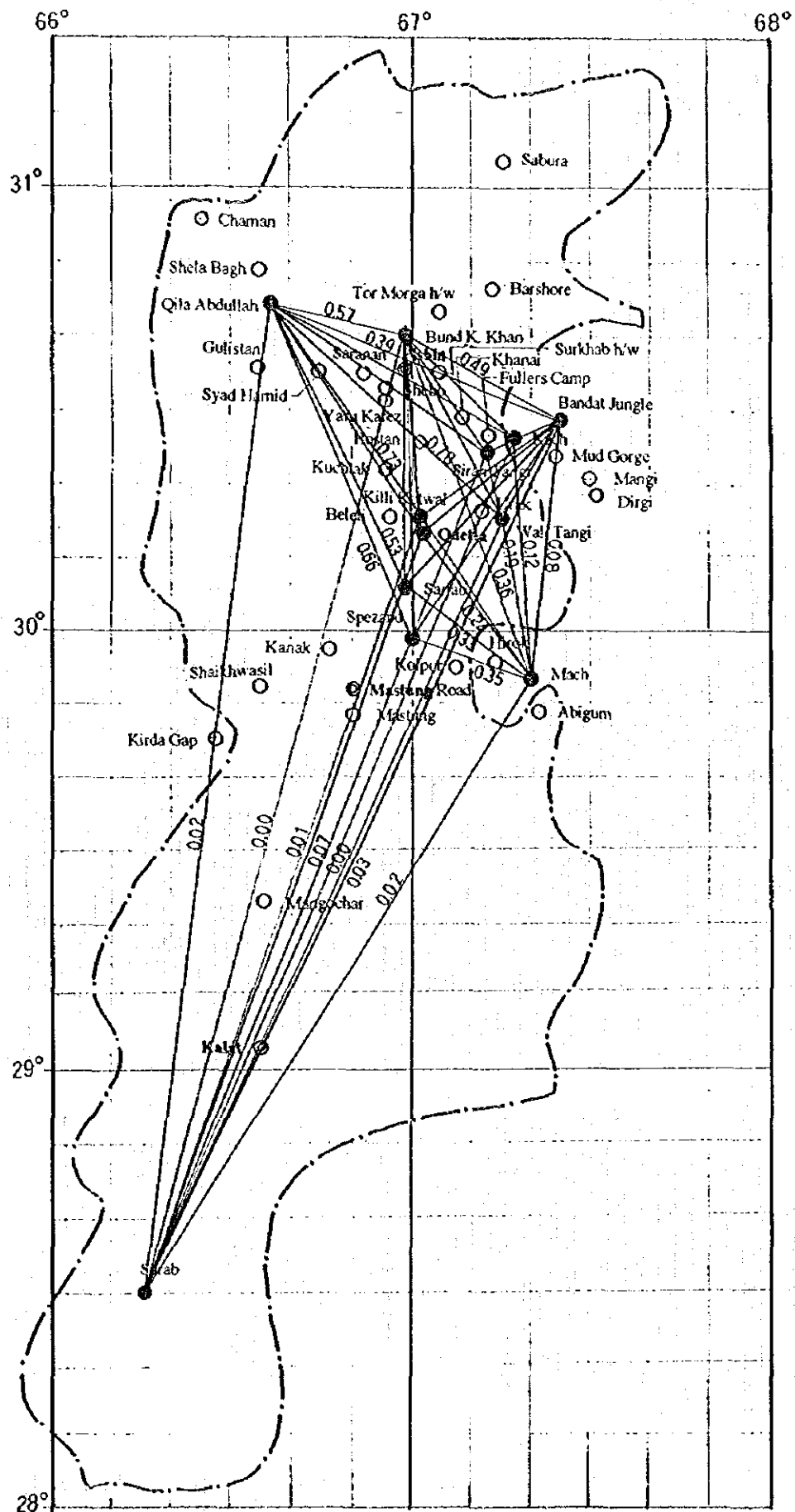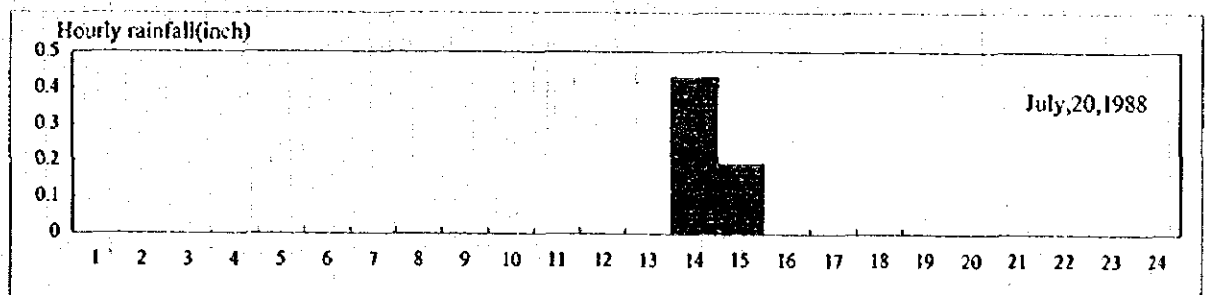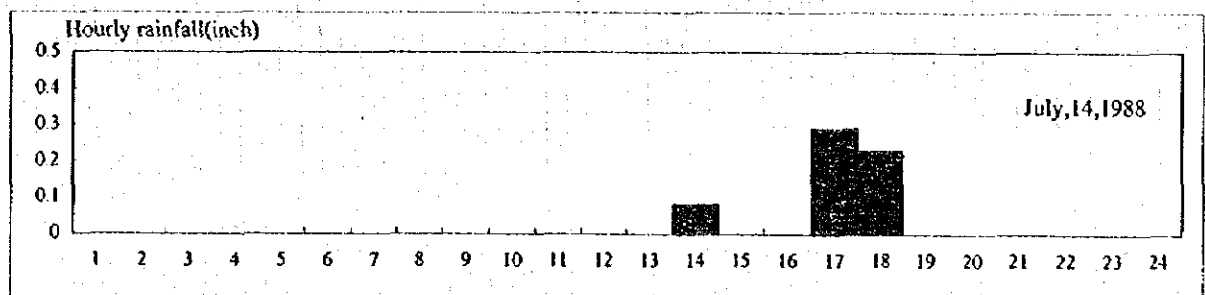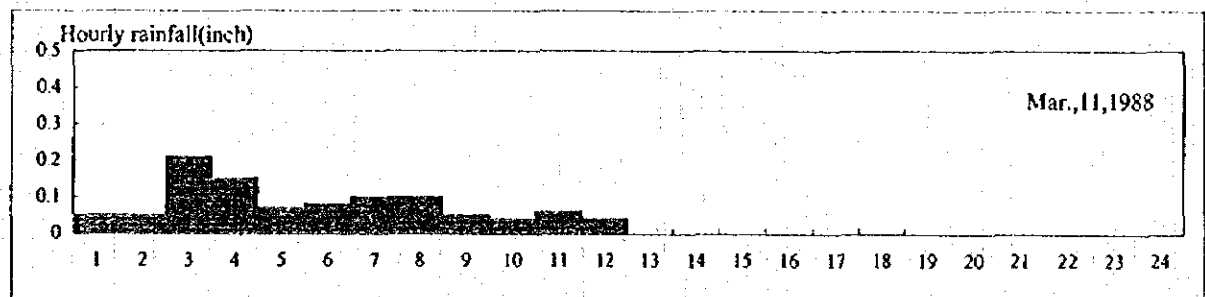
Fig. B.1.3   Correlation Relation among Ralated Stations
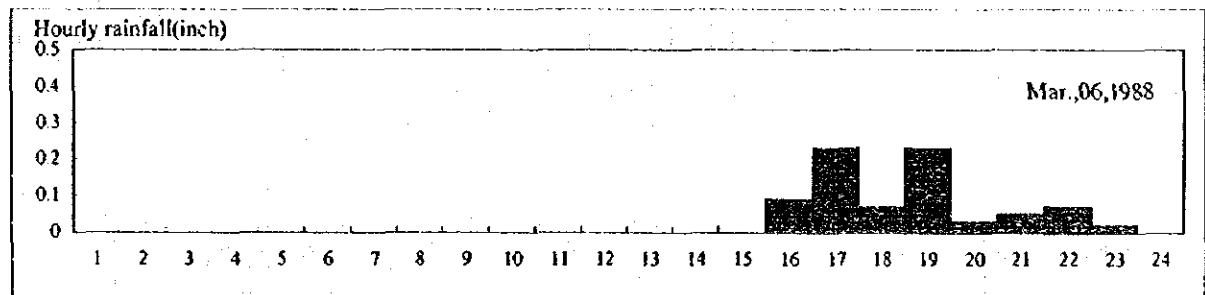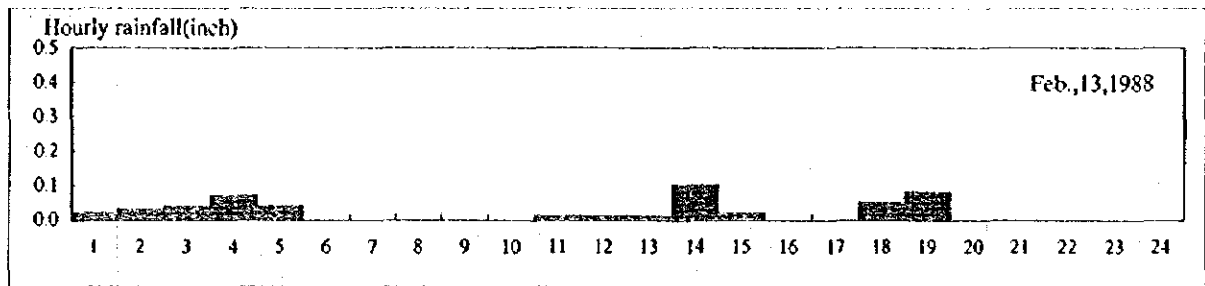
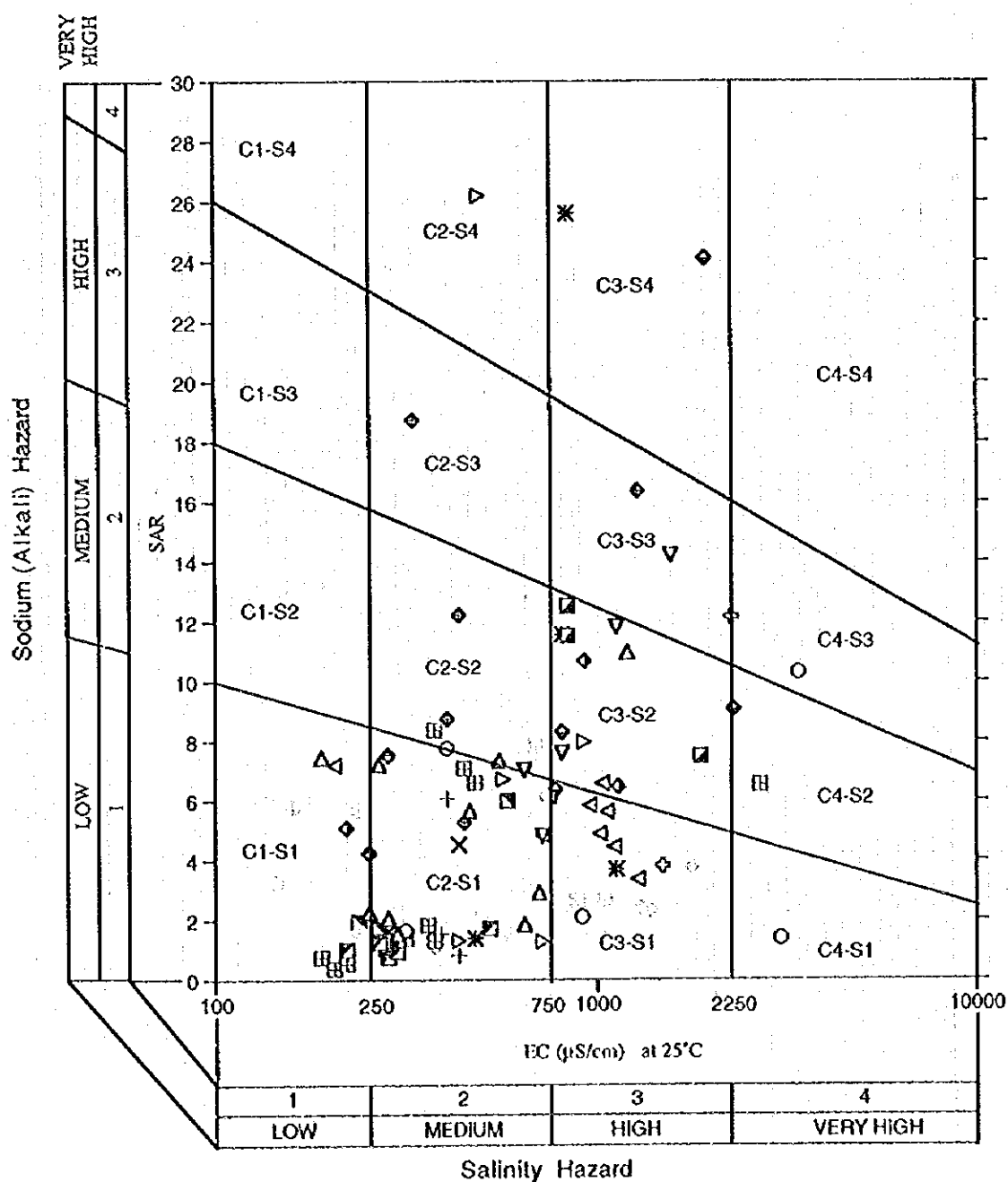Fig. B.1.4   Comparison between Typical Winter Rainfall and Summer Rainfall

Fig. B.2.1   Classification of Irrigation Water