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PICKERING AREA, RECORDING RAIN GAUGE NETWORK

BY

D.A. CARR

CLI-4-74

DOWNSVIEW, 1974

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ABSTRACT

In 1973, environmental studies were undertaken at the Pickering area of Ontario in order to develop the new Toronto International Airport and the expansion of the Ontario Provincial network of stations.

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En 1973, des études environnementales ont été entreprises dans la région de Pickering en Ontario pour développer le nouvel aéroport international de Toronto et l'expansion du réseau provincial canadien de stations météorologiques. Ce rapport comporte les observations physiques et météorologiques réalisées en 1973 et les analyses de quelques longues séries d'observations de pluie dans la région de Pickering. Il est démontré que la pluie en 1973 démontre qu'il y a une grande variabilité temporelle dans la pluie à dependent sur l'heure.

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PICKERING AREA, RECORDING RAIN GAUGE NETWORK

ABSTRACT

Early in 1973 a number of environmental studies were undertaken in the Pickering area of Ontario in support of a plan to develop the new Toronto International Airport and the proposed city of Cedarwood, Ontario. Initially a network of stations was established to collect meteorological data. This report lists daily and monthly rainfall observations collected during 1973 and includes analyses of some of the storms which produced significant rainfalls in the Pickering area. An inter-comparison of monthly rainfall totals in 1973 indicates that there were some deviations from normal, however, the total annual rainfall was normal.

RÉGION DE PICKERING, RÉSEAU DES PLUVIOMÈTRES ENREGISTREURS

SOMMAIRE

Dès les premiers mois de 1973 des études sur l'environnement ont été entreprises dans la région de Pickering, Ontario, à l'appui d'un plan visant à développer le nouvel aéroport international de Toronto et la ville de Cedarwood en Ontario. Au début, un réseau de stations a été établi pour recueillir des données météorologiques. Ce rapport comporte les observations pluviométriques journalières et mensuelles recueillies en 1973 et les analyses de quelques tempêtes qui ont provoqué d'importantes chutes de pluie dans la région de Pickering. Une comparaison entre les totaux mensuels de pluie en 1973 démontre qu'il y a eu quelques déviations de la normale; la pluviosité annuelle totale a cependant été normale.

PICKERING AREA, RECORDING RAIN GAUGE NETWORK

During the period April to November, 1973, the Atmospheric Environment Service of the Department of the Environment operated a network of twelve recording rain gauges in Pickering Township, Ontario, (Figure 1) which is located approximately fifteen miles east of Toronto, Ontario. The purpose of the network was to assist the Ontario Ministry of the Environment and others in compiling data to correlate with stream flow and ground water measurements in the Duffin Creek drainage basin. The network also provided ground-truth rainfall measurements for comparison to data from the Atmospheric Environment Service research radar installation at Woodbridge, Ontario.

The tipping bucket rain gauge was selected for the network because it can measure, accurately, short-duration rainfalls to the nearest one-hundredth of an inch (0.01 in). Each gauge was connected to a seven-day step recorder which was placed in a small instrument shelter located within fifteen feet of the rain gauge (Figure 2). Both the gauge and recorder were battery-operated, thereby preventing the possible loss of data during power interruptions.

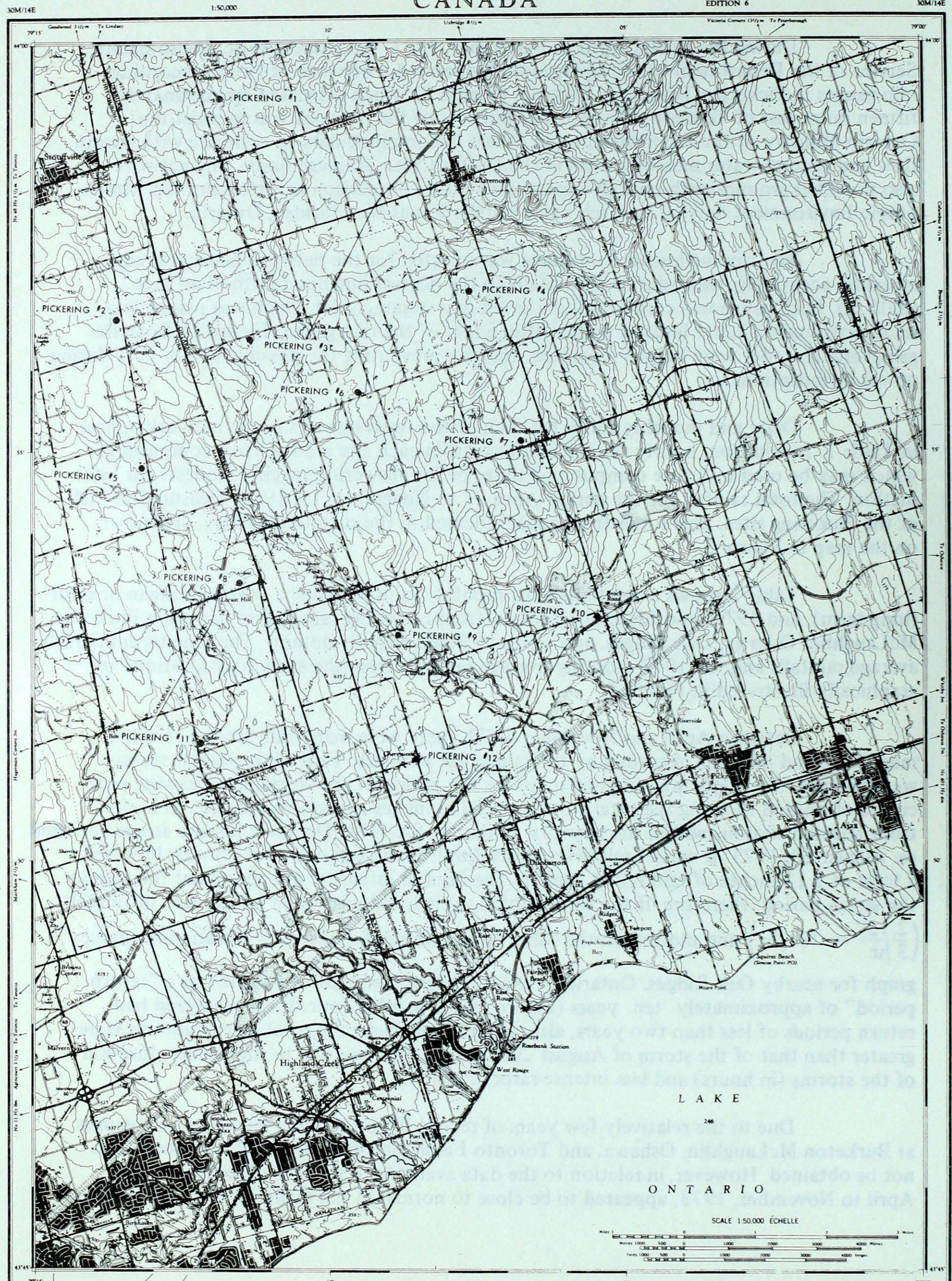
Daily and monthly totals for each of the twelve gauges in the network appear in Table 1. In addition, hourly rainfall amounts from each site are kept in a computer file which may be used in future computer analyses or for answering specific requests for information. The total rainfall for the period April 27 to November 15, 1973, measured at each of the Pickering sites, plus totals from gauges located in the surrounding area, are shown on the map in Figure 3.

Table 2 shows a comparison of monthly rainfalls using a four-year mean or more (long-term), and 1973 monthly rainfall totals, from recording rain gauges located at Burketon McLaughlin, Oshawa, Oak Ridges, and Toronto Fallingbrook, Ontario. The long-term monthly average rainfalls and the 1973 monthly average rainfalls from the same four locations are graphically illustrated in Figure 4.

Between April and November 1973, there were many rain storms of varied magnitude and intensity recorded by the rain gauge network. Five of the largest storms were analyzed by preparing isohyetal maps for the period of the storm, and drawing mass curves of rainfall showing the total storm-rainfall in inches and storm duration in hours, from selected stations within the network (Figures 5A-9B). The most intense storm occurred on August 20, 1973. It was of relatively short duration, lasting only three hours; however, a total of 2.12 inches of rain fell at site #1. The rainfall intensity was consistent throughout the storm period; therefore, if the total rainfall value is reduced to an hourly rate of rainfall ($\frac{2.12}{3 \text{ hr}} = .70''/\text{hr}$) and plotted on the "short duration rainfall-intensity-duration-frequency" graph for nearby Oak Ridges, Ontario, it can be determined that this storm has a "return period" of approximately ten years (Figure 10). The other four storms analyzed had return periods of less than two years, although in some cases the total storm rainfalls were greater than that of the storm of August 20th, 1974. This was due to the greater duration of the storms (in hours) and less intense rates of rainfall.

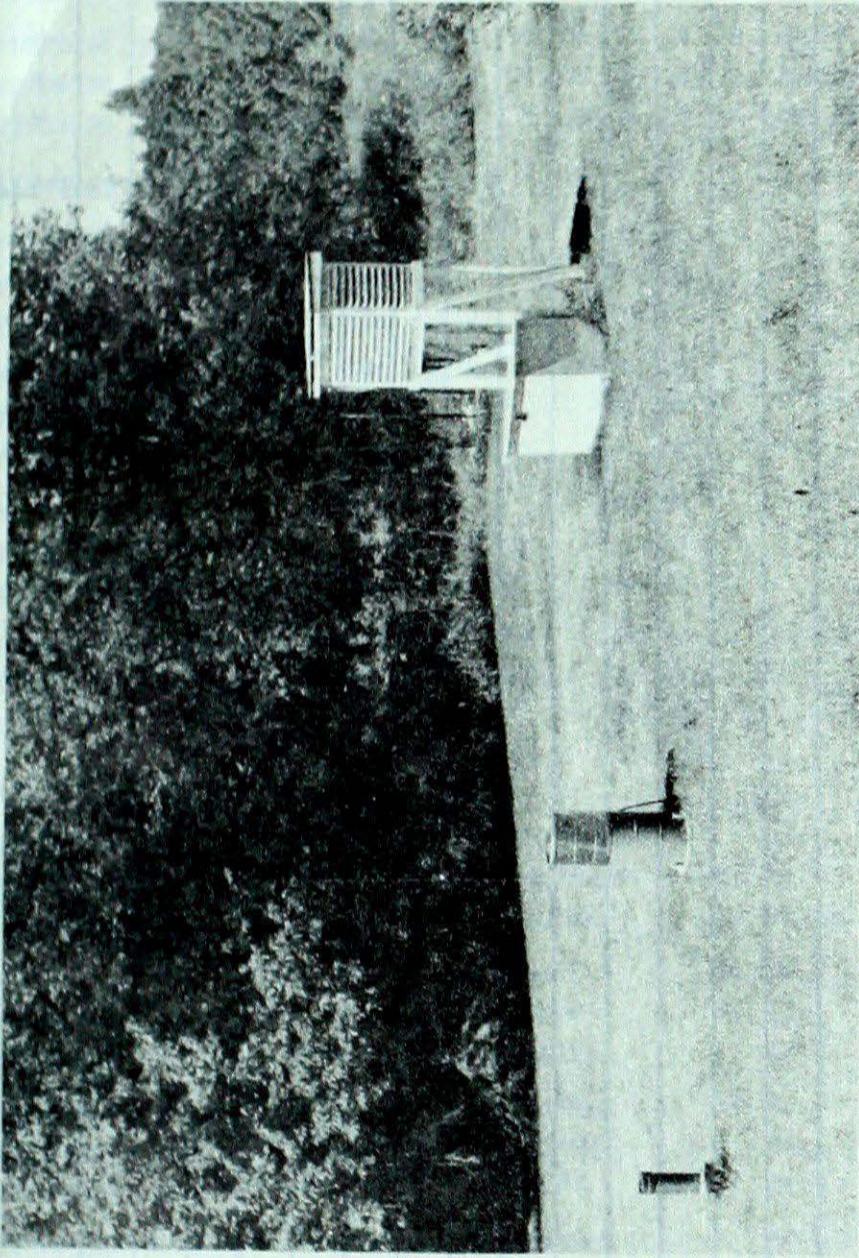
Due to the relatively few years of record from the three recording rain gauges at Burketon McLaughlin, Oshawa, and Toronto Fallingbrook, a true long-term mean can not be obtained. However, in relation to the data available, total rainfall for the period April to November, 1973, appeared to be close to normal in the Pickering area of Ontario.

2
CANADA

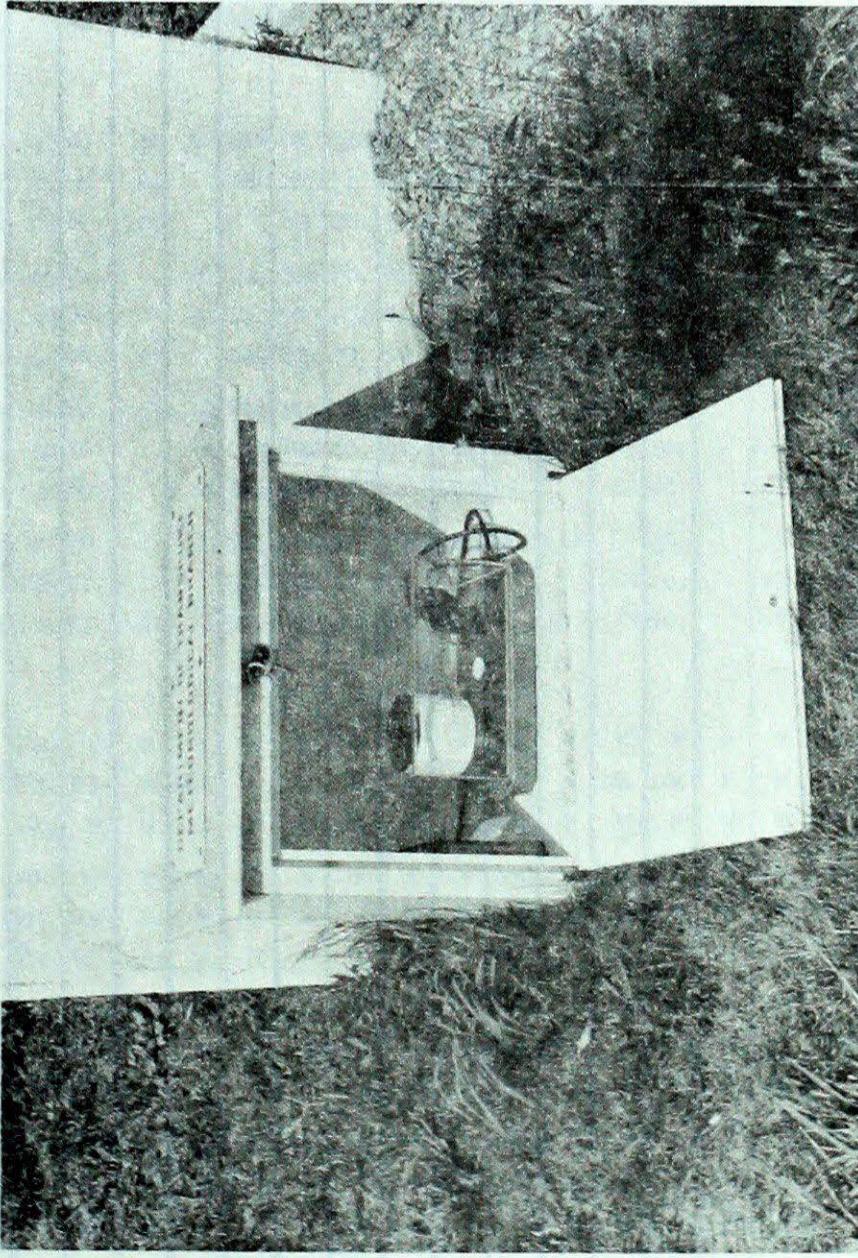


PICKERING AREA, RECORDING RAIN GAUGE NETWORK

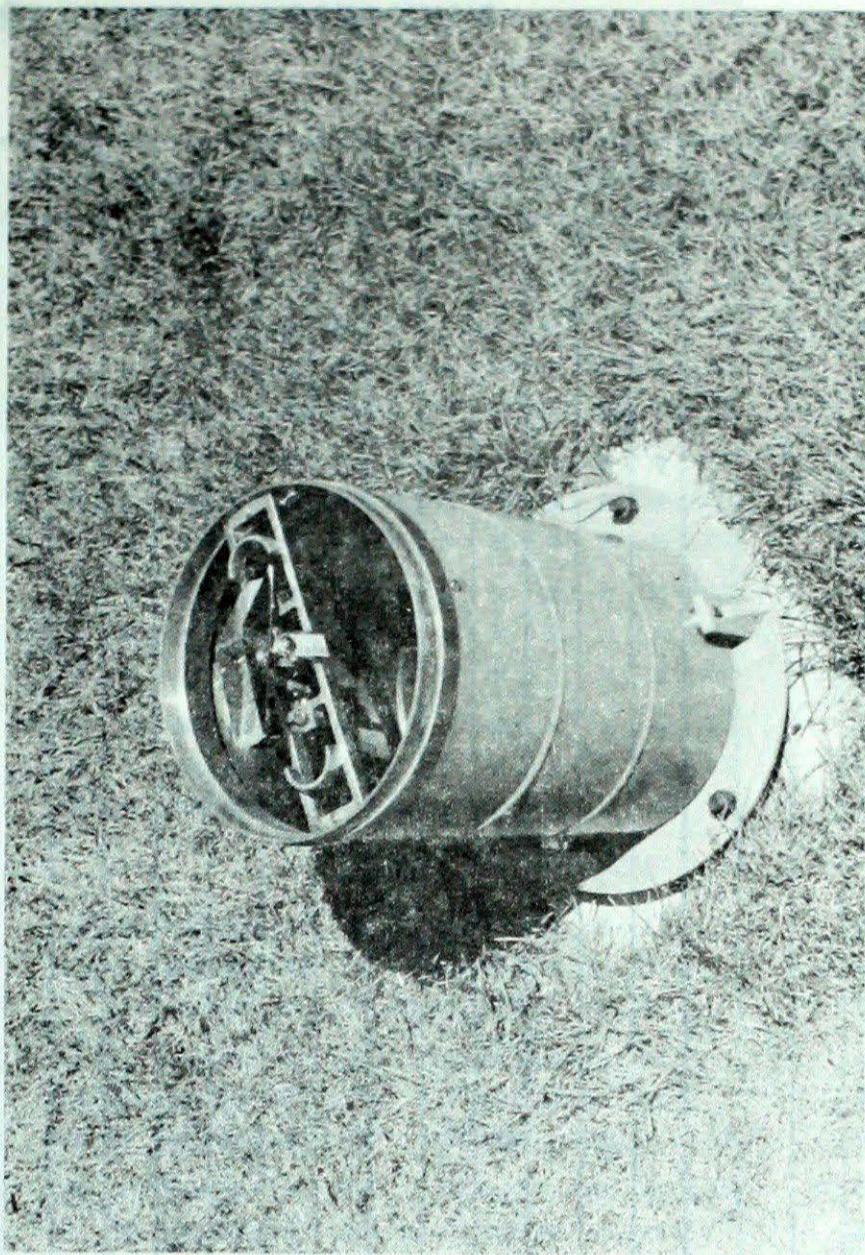
FIGURE 1



COMPLETE INSTALLATION



STEP RECORDER



TIPPING BUCKET RECEIVER

FIGURE 2

DAILY PRECIPITATION — PRÉCIPITATION QUOTIDIENNE

Table 1

| STATION | 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 | Total |
|-------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|-----|------|------|------|-------|
| APRIL 1973 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| PICKERING #1 | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | .38 | .01 | M | | | | |
| PICKERING #2 | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | .22 | .03 | M | | | | | |
| PICKERING #3 | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | .39 | .28 | M | | | | | |
| PICKERING #4 | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | .45 | .28 | M | | | | | |
| PICKERING #5 | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | .57 | .21 | M | | | | | |
| PICKERING #6 | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | .40 | .27 | M | | | | | |
| PICKERING #7 | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | .57 | .28 | M | | | | | |
| PICKERING #8 | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | .53 | .19 | M | | | | | |
| PICKERING #9 | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | .44 | .22 | M | | | | | |
| PICKERING #10 | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | .62 | .21 | M | | | | | |
| PICKERING #11 | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | .52 | .15 | .01 | | | | | |
| PICKERING #12 | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | .56 | .20 | M | | | | | |
| MAY 1973 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| PICKERING #1 | .11 | .17 | .02 | .04 | .01 | | | | .66 | .23 | .53 | .05 | | | | .07 | .12 | | | | .08 | .09 | | | | .32 | .01 | .76 | .01 | .01 | .02 | 3.31 |
| PICKERING #2 | .12 | .19 | .02 | .04 | .01 | | | | .64 | .06 | .62 | .03 | .01 | | | .01 | .06 | .11 | | | .08 | .08 | | | | .30 | .01 | .76 | .05 | .01 | .03 | 3.24 |
| PICKERING #3 | .12 | .19 | .01 | .04 | .02 | | | | .60 | .04 | .59 | .05 | | | | .07 | .13 | | | | .10 | .05 | | | | .29 | .81 | .01 | .03 | .316 | | |
| PICKERING #4 | .12 | .18 | .01 | .05 | .01 | .04 | | | .58 | .07 | .46 | .06 | | | | .07 | .12 | | | | .06 | .03 | .01 | | .01 | .22 | .87 | .01 | .02 | .300 | | |
| PICKERING #5 | .12 | .17 | .01 | .03 | | | | | .62 | .04 | .59 | .05 | .01 | | | .06 | .11 | | | | .08 | .07 | | | | .25 | .01 | .90 | .01 | .01 | .01 | 3.15 |
| PICKERING #6 | .13 | .21 | .03 | .01 | | | | | .64 | .09 | .49 | .06 | .01 | | | .08 | .11 | | | | .08 | .04 | | | | .01 | .27 | .93 | .01 | .01 | .320 | |
| PICKERING #7 | .14 | .20 | .04 | | | | | | .77 | .02 | .58 | .05 | .01 | | | .06 | .13 | | | | .07 | .02 | | | | .22 | .91 | .01 | .04 | .327 | | |
| PICKERING #8 | .13 | .22 | .01 | .02 | | | | | .64 | .08 | .54 | .06 | .01 | | | .07 | .15 | | | | .15 | | | | | .26 | .97 | .06 | .01 | .07 | .345 | |
| PICKERING #9 | .16 | .18 | .03 | | | | | | .59 | .01 | .58 | .05 | .02 | | | .05 | .12 | | | | .04 | .04 | | | | .24 | .105 | .06 | .10 | .332 | | |
| PICKERING #10 | .16 | .20 | .03 | | | | | | .67 | .06 | .54 | .06 | .03 | | | .12 | .15 | | | | .04 | .03 | | | | .01 | .25 | .91 | .04 | .12 | .342 | |
| PICKERING #11 | .17 | .18 | .01 | .04 | | | | | .73 | .02 | .48 | .06 | .04 | | | .07 | .13 | | | | .13 | .05 | | | | .01 | .27 | .01 | .105 | .08 | .09 | 3.63 |
| PICKERING #12 | .17 | .20 | .03 | | | | | | .68 | .03 | .53 | .05 | .04 | | | .09 | .15 | | | | .05 | .03 | | | | .26 | .01 | .95 | .13 | .17 | .357 | |
| JUNE 1973 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| PICKERING #1 | .13 | | .12 | .06 | .17 | .13 | .04 | .01 | | | .04 | | | | | | | | | .11 | | .03 | .24 | .05 | .53 | | .01 | .02 | .68 | | 2.37 | |
| PICKERING #2 | .06 | | .40 | .06 | .07 | .13 | .10 | M | | | M | | | | | | | | | .15 | .01 | .05 | .22 | .11 | .42 | | .01 | .06 | .82 | | M | |
| PICKERING #3 | .09 | | .36 | .15 | .07 | .05 | .08 | | | | .06 | | | | | | | | | .17 | | .20 | .04 | .25 | .02 | .05 | .02 | .38 | | 1.99 | | |
| PICKERING #4 | .06 | | .21 | .12 | .16 | .05 | .05 | .01 | | | .07 | | | | | | | | | .15 | .01 | .07 | .21 | | .19 | .01 | .52 | | 1.96 | | | |
| PICKERING #5 | .09 | | .50 | .11 | .10 | .04 | .07 | .01 | | | .06 | | | | | | | | .19 | .01 | .02 | .05 | .23 | | .01 | .06 | .63 | | 2.18 | | | |
| PICKERING #6 | .09 | | .27 | .10 | .22 | .04 | .05 | .01 | | | .07 | | | | | | | | .19 | | .01 | .11 | .20 | | .16 | .01 | .31 | | 1.84 | | | |
| PICKERING #7 | .14 | | .26 | .10 | .13 | .03 | .05 | .02 | | | .07 | | | | | | | | .17 | .01 | .08 | .04 | .30 | | .36 | .01 | .56 | | 2.33 | | | |
| PICKERING #8 | .05 | | .40 | .07 | .16 | .03 | .08 | .01 | | | .05 | | | | | | | | .23 | | .05 | .02 | .22 | | .10 | .05 | .50 | .01 | | 2.03 | | |
| PICKERING #9 | .04 | | .27 | .10 | .12 | .01 | .04 | .01 | | | .08 | | | | | | | | .35 | .01 | .18 | .02 | .24 | | .18 | .01 | .47 | | 2.13 | | | |
| PICKERING #10 | .05 | | .33 | .06 | .14 | .01 | .05 | .02 | | | .07 | | | | | | | | .39 | | .05 | .01 | .23 | | .20 | .01 | .35 | | 1.98 | | | |
| PICKERING #11 | .04 | | .11 | .07 | .02 | .03 | .02 | | | | .12 | .01 | | | | | | | .28 | .01 | .19 | .61 | .24 | | .07 | .55 | .48 | .01 | </ | | | |

DAILY PRECIPITATION — PRÉCIPITATION QUOTIDIENNE

Table 1

| STATION | 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 | Total | |
|-----------------------|-----|-----|-----|-----|---|---|---|-----|-----|-----|-----|-----|-----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|----|----|------|------|------|-------|------|
| AUGUST 1973 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| PICKERING #1 | .98 | | | | | | | .17 | | .17 | .04 | | | | | | .13 | .13 | .01 | 212 | | | | | | | | | | 3.89 | | | |
| PICKERING #2 | .95 | .01 | | | | | | .15 | .01 | .30 | .22 | .02 | | | | | .27 | .16 | .01 | 156 | | | | | | | | | 3.82 | | | | |
| PICKERING #3 | .95 | .01 | | | | | | | | .88 | .03 | .01 | | | | | .40 | .24 | .09 | .04 | | | | | | | | | | 2.77 | | | |
| PICKERING #4 | .72 | | | | | | | | | .02 | .32 | .06 | .01 | | | | | .62 | .09 | | | | | | | | | | .21 | .07 | 2.12 | | |
| PICKERING #5 | 127 | | | | | | | | | .83 | .05 | | | | | | .02 | .49 | .06 | .16 | | | | | | | | | | .08 | .02 | 2.99 | |
| PICKERING #6 | .88 | | | | | | | | | .63 | .05 | .01 | | | | | .42 | .06 | .08 | | | | | | | | | | | .20 | .13 | 2.47 | |
| PICKERING #7 | .75 | | | | | | | | | .62 | .12 | .01 | | | | | .20 | .56 | .08 | | | | | | | | | | .19 | .18 | 2.72 | | |
| PICKERING #8 | .86 | .02 | | | | | | | | 111 | .17 | .01 | | | | | .08 | .13 | .09 | | | | | | | | | | .06 | .14 | 2.68 | | |
| PICKERING #9 | .73 | .02 | | | | | | | | .84 | .08 | | | | | | .51 | .11 | | | | | | | | | | | | .16 | .03 | 2.50 | |
| PICKERING #10 | .61 | | | | | | | | | .65 | | | | | | | .03 | .65 | .10 | | | | | | | | | | | .28 | .01 | 2.34 | |
| PICKERING #11 | .67 | .02 | | | | | | | | .01 | .90 | .08 | | | | | .03 | .09 | .11 | | | | | | | | | | .12 | .07 | 2.10 | | |
| PICKERING #12 | .69 | | | | | | | .08 | | | | | | | | .68 | .02 | .01 | .02 | | | | | | | | | | | | | 3.22 | |
| SEPTEMBER 1973 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| PICKERING #1 | .10 | | | | | | | | | | | | | | | | .01 | .01 | .28 | .30 | .01 | .08 | | .31 | .36 | | | | | | 1.46 | | |
| PICKERING #2 | .02 | .18 | | | | | | | | | | | | | | | | .49 | .19 | .01 | .06 | | .33 | .31 | | | | | | | | 1.59 | |
| PICKERING #3 | .22 | .03 | | | | | | | | | | | | | | | | .26 | .46 | | .08 | .01 | .36 | .35 | | | | | | | | 1.77 | |
| PICKERING #4 | .64 | .02 | | | | | | | | | | | | | | | | .41 | .38 | .01 | .09 | | .34 | .33 | | | | | | | | 2.22 | |
| PICKERING #5 | .06 | | | | | | | | | | | | | | | | | .24 | .35 | | .07 | | .34 | .35 | | | | | | | | 1.41 | |
| PICKERING #6 | .34 | .01 | | | | | | | | | | | | | | | | .36 | .38 | .01 | .08 | | .38 | .32 | | | | | | | | 1.89 | |
| PICKERING #7 | .35 | .01 | | | | | | | | | | | | | | | | .35 | .26 | .01 | .09 | | .40 | .29 | | | | | | | | 1.78 | |
| PICKERING #8 | .22 | | | | | | | | | | | | | | | | | .37 | .31 | | .08 | .01 | .40 | .36 | | | | | | | | 1.75 | |
| PICKERING #9 | .06 | | | | | | | | | | | | | | | | | .38 | .26 | | .08 | | .44 | .36 | | | | | | | | 1.58 | |
| PICKERING #10 | .22 | | | | | | | | | | | | | | | | | .32 | .25 | | .09 | | .46 | .34 | | | | | | | | 1.68 | |
| PICKERING #11 | | | | | | | | | | | | | | | | | | .42 | .18 | | .06 | | .43 | .32 | | | | | | | | 1.41 | |
| PICKERING #12 | | | | | | | | | | | | | | | | | | .38 | .22 | | .06 | .01 | .57 | .32 | | | | | | | | 1.56 | |
| OCTOBER 1973 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| PICKERING #1 | .49 | .04 | .02 | .01 | | | | | | | | | | | | | .01 | .29 | .05 | | .02 | .02 | .08 | .37 | .01 | | | | | | | | 3.46 |
| PICKERING #2 | .45 | .01 | .02 | .01 | | | | | | | | | | | | | | .25 | .05 | | .01 | .10 | .29 | | | | | | | | | | 3.21 |
| PICKERING #3 | .57 | .01 | .04 | .01 | | | | | | | | | | | | | .01 | .22 | .06 | | .01 | .07 | .32 | | | | | | | | | 3.28 | |
| PICKERING #4 | .54 | .01 | .05 | | | | | | | | | | | | | | | .26 | .05 | | .01 | .07 | .34 | | | | | | | | | 3.53 | |
| PICKERING #5 | .39 | .01 | .04 | | | | | | | | | | | | | | .01 | .25 | .06 | | .01 | .10 | .23 | .01 | | | | | | | | 3.02 | |
| PICKERING #6 | .39 | .01 | .04 | .01 | | | | | | | | | | | | | | .26 | .04 | | .01 | .09 | .31 | | | | | | | | | 3.74 | |
| PICKERING #7 | .53 | .01 | .10 | .01 | | | | | | | | | | | | | .01 | .23 | .04 | | .01 | .01 | .06 | .31 | .01 | | | | | | | | 3.41 |
| PICKERING #8 | .44 | .08 | .01 | | | | | | | | | | | | | | .01 | .21 | .05 | | .01 | .07 | .22 | | | | | | | | | 3.25 | |
| PICKERING #9 | .44 | .06 | .01 | | | | | | | | | | | | | | | .18 | .06 | | .01 | .06 | .24 | | | | | | | | | 3.46 | |
| PICKERING #10 | .60 | .01 | .06 | .03 | | | | | | | | | | | | | | .24 | .06 | | .01 | .05 | .26 | | | | | | | | | 3.47 | |
| PICKERING #11 | .51 | .06 | .02 | | | | | | | | | | | | | | | .20 | .05 | | | .08 | .21 | | | | | | | | | 3.31 | |
| PICKERING #12 | .60 | .08 | .01 | | | | | | | | | | | | | | | .29 | .14 | | .01 | | .01 | .25 | | | | | | | | | |

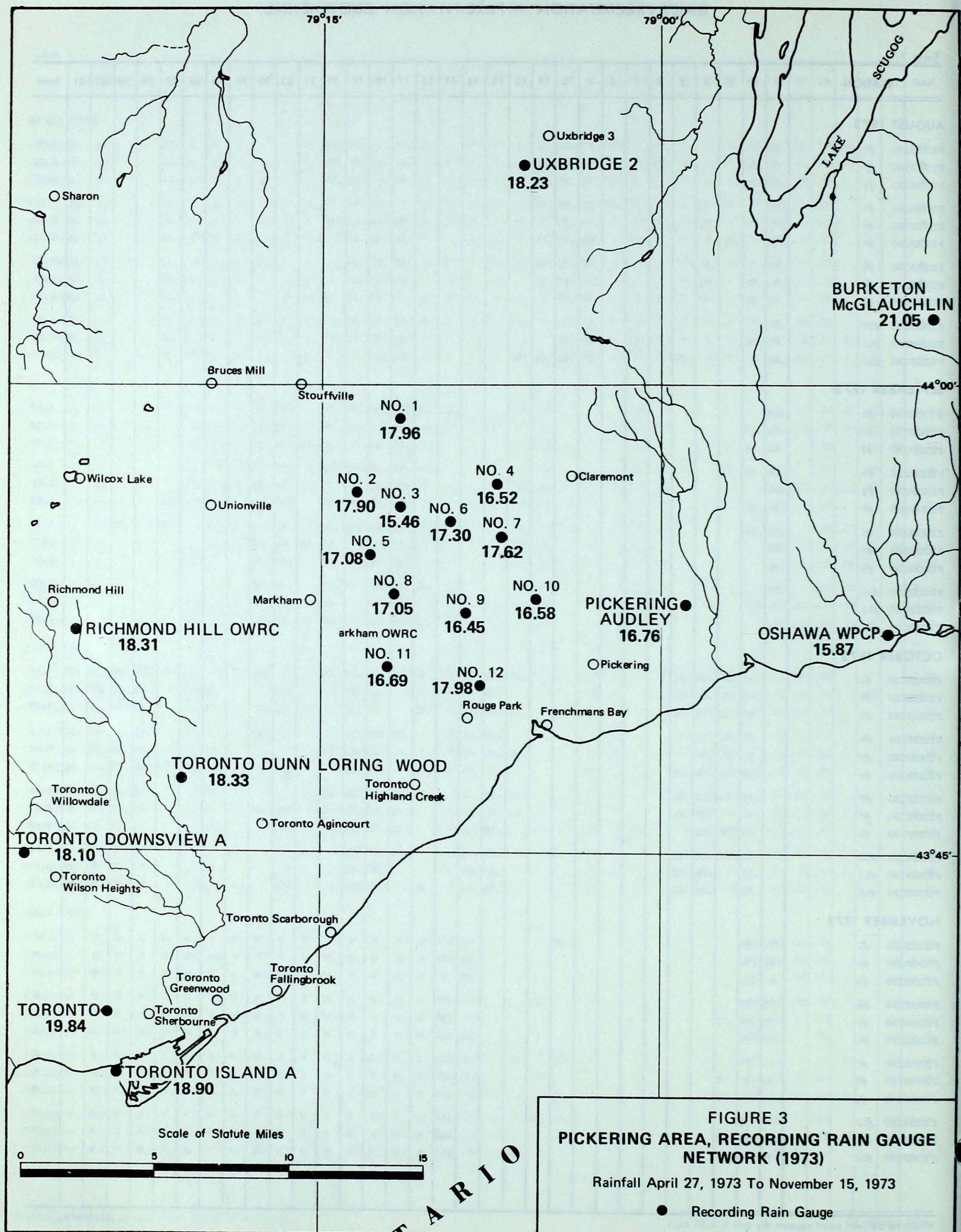


TABLE 2
MONTHLY RAINFALL

| Station Name | Apr | May | June | July | Aug | Sept | Oct | Nov | Total |
|-----------------------------|------|------|------|------|------|------|------|------|--------|
| Burketon McLaughlin | | | | | | | | | |
| Mean Rainfall (4 yr) | 2.36 | 2.29 | 3.65 | 3.49 | 2.78 | 2.30 | 2.76 | 2.42 | 22.05 |
| 1973 Rainfall | 2.71 | 4.36 | 2.65 | 2.25 | 2.22 | 1.88 | 4.73 | 4.14 | 24.94 |
| Oshawa | | | | | | | | | |
| Mean Rainfall (4 yr) | 2.06 | 2.23 | 4.21 | 2.87 | 3.75 | 1.73 | 2.93 | 2.14 | 21.92 |
| 1973 Rainfall | 3.45 | 3.52 | 2.06 | 1.72 | 0.81 | 1.93 | 4.09 | 3.04 | 20.62 |
| Oak Ridges | | | | | | | | | |
| Mean Rainfall (43 yr) | 2.42 | 2.87 | 2.52 | 3.50 | 3.02 | 2.61 | 2.58 | 2.19 | 19.71 |
| 1973 Rainfall | 2.51 | 3.85 | 2.90 | 1.73 | 1.92 | 1.59 | 3.66 | 3.00 | 21.16 |
| Toronto Fallingbrook | | | | | | | | | |
| Mean Rainfall (15 yr) | 2.60 | 2.95 | 2.42 | 3.05 | 2.87 | M | 2.45 | 2.56 | 18.90* |
| 1973 Rainfall | 2.53 | 3.82 | 2.44 | 2.32 | 0.81 | M | 4.82 | 3.18 | 19.38* |

* Less September Total

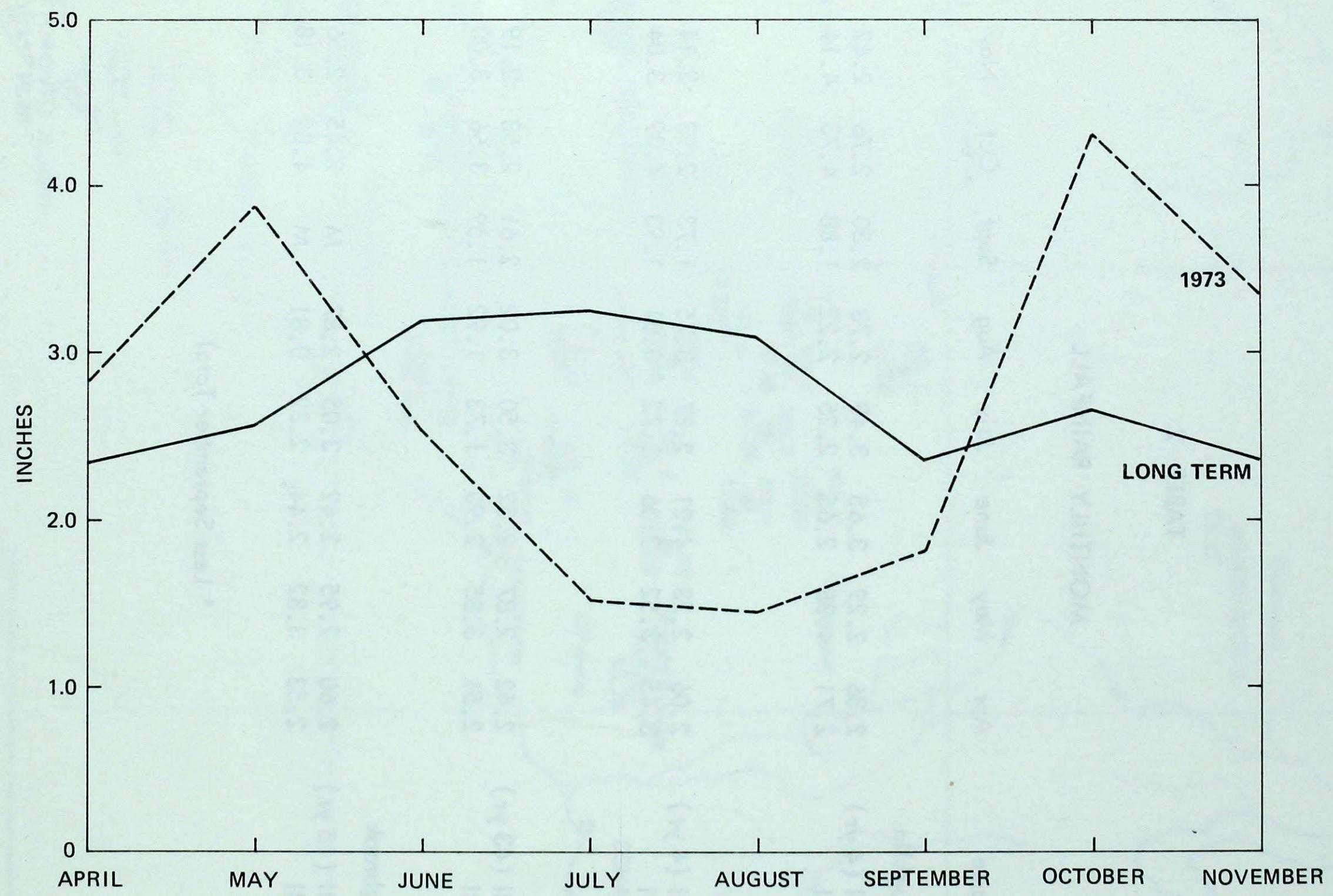
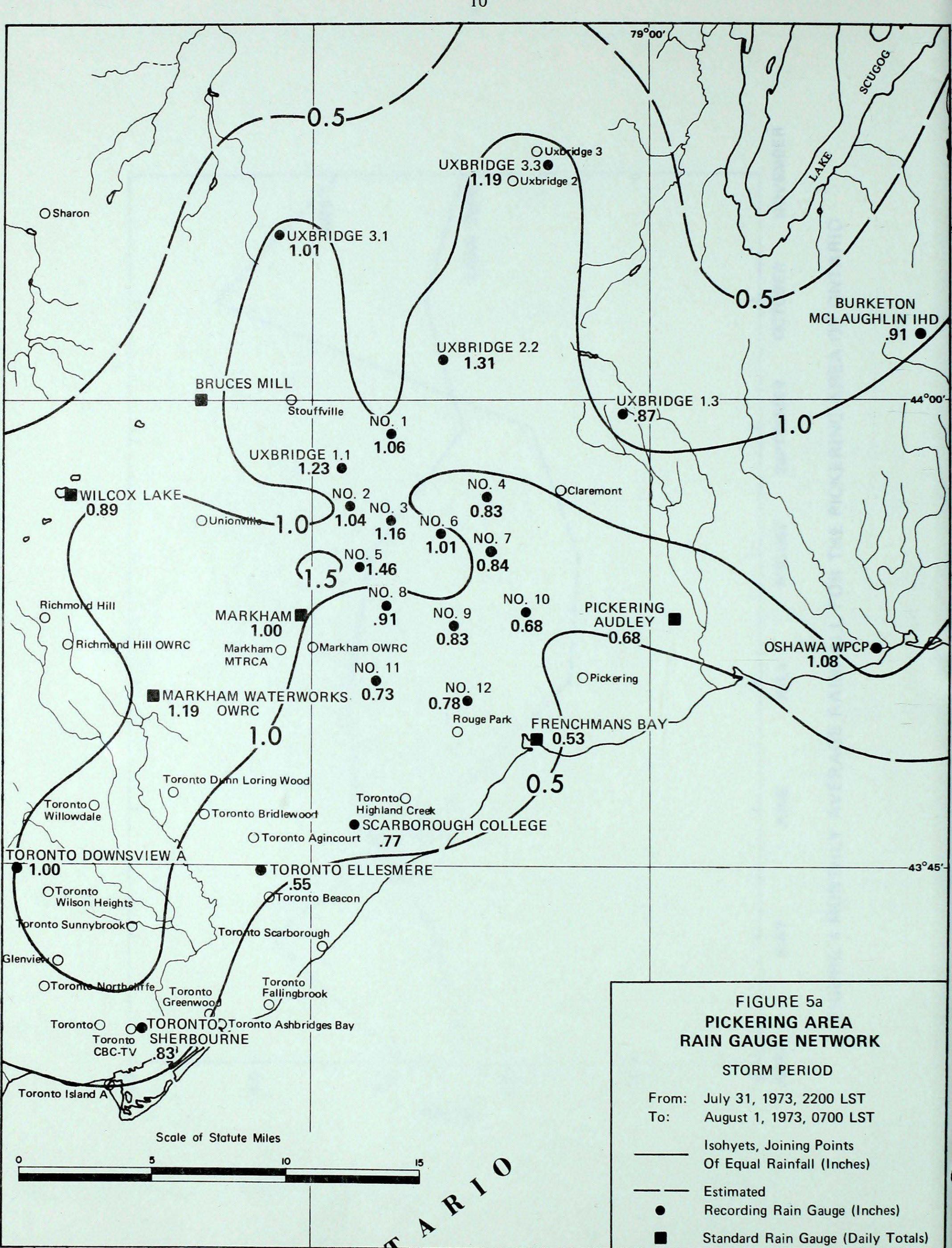
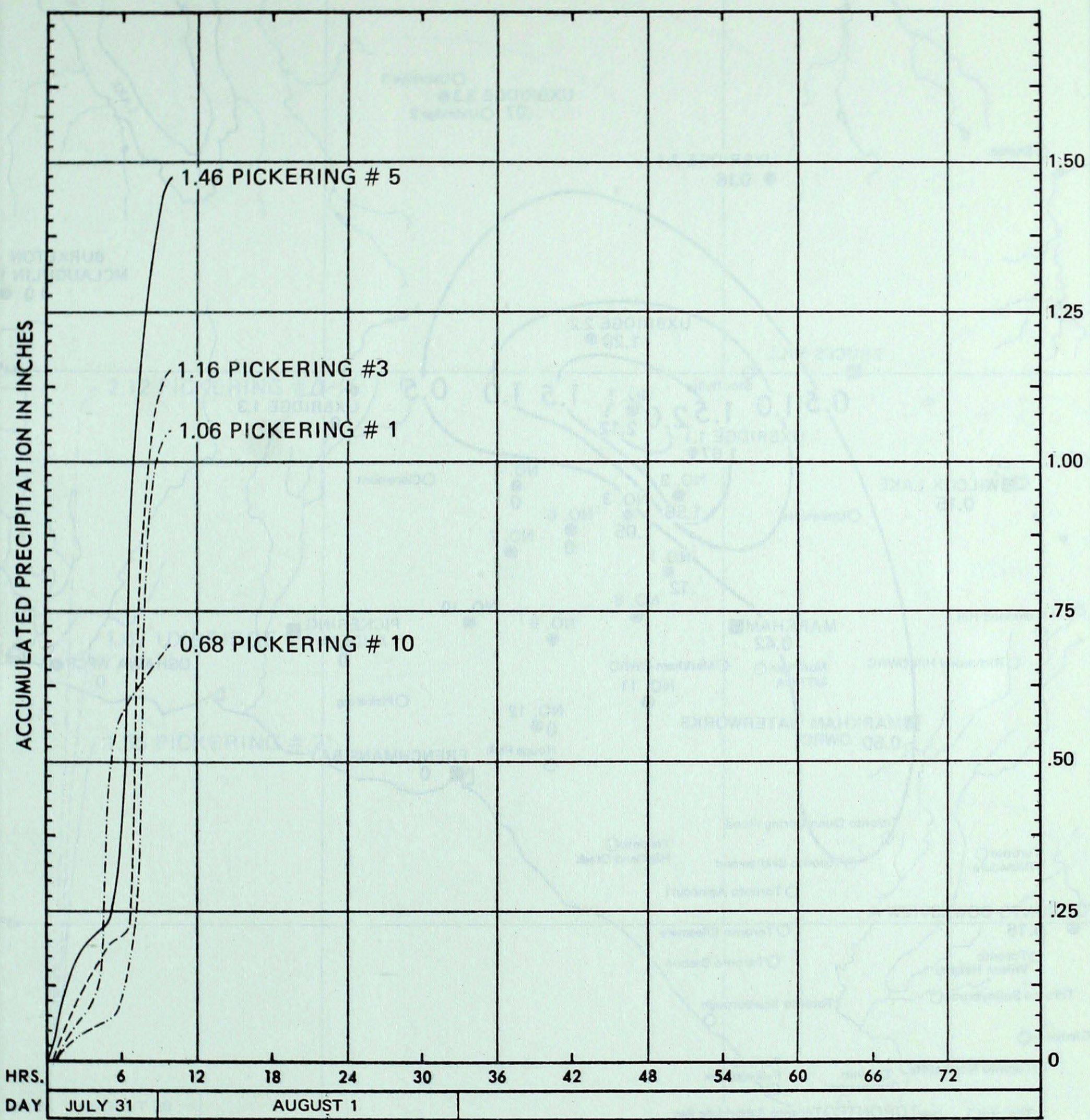


FIGURE 4 MONTHLY AVERAGE RAINFALL FOR THE PICKERING AREA OF ONTARIO



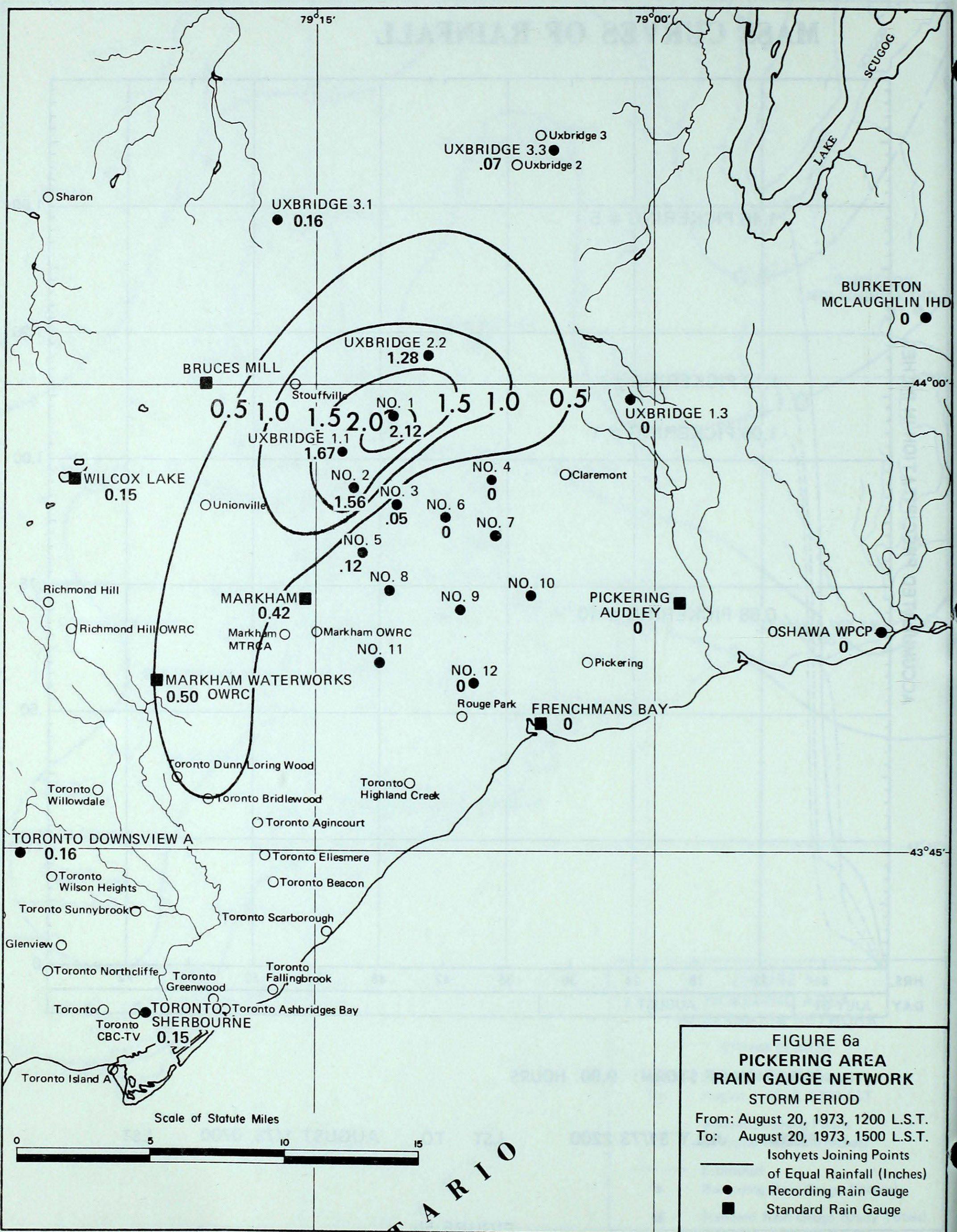
MASS CURVES OF RAINFALL



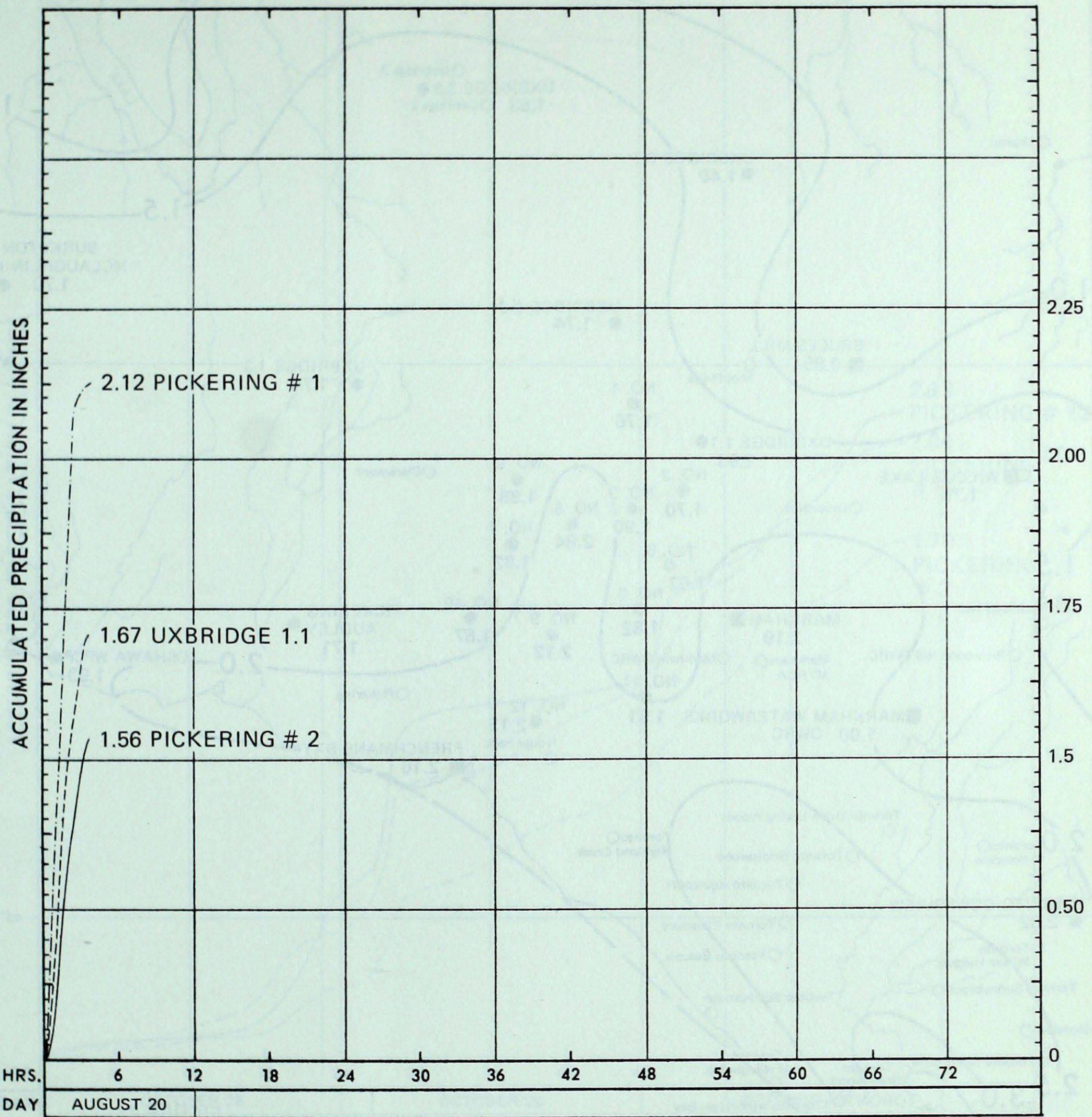
DURATION OF STORM: 9.00 HOURS

FROM JULY 31/73 2200 LST TO AUGUST 1/73, 0700 LST

FIGURE 5b



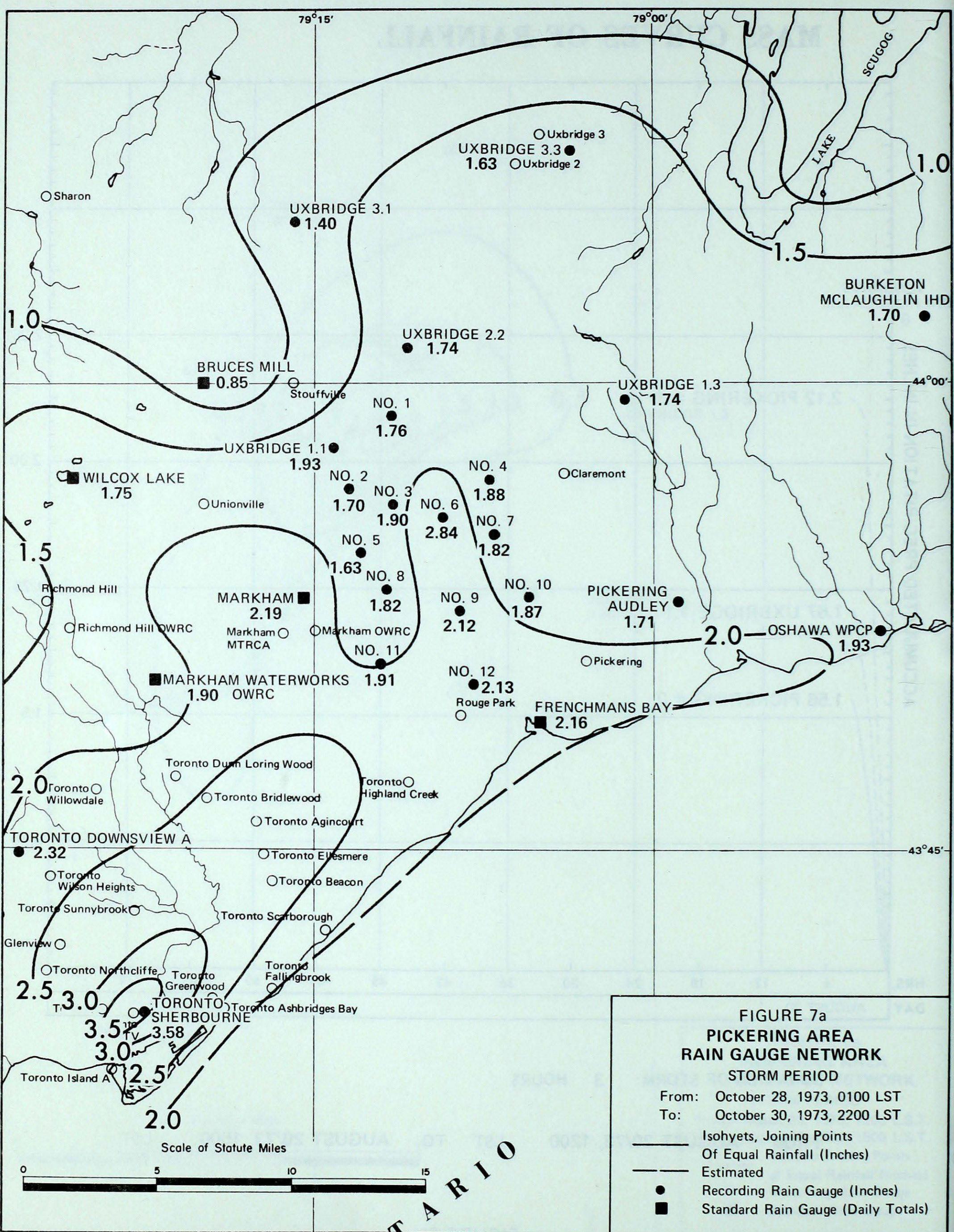
MASS CURVES OF RAINFALL



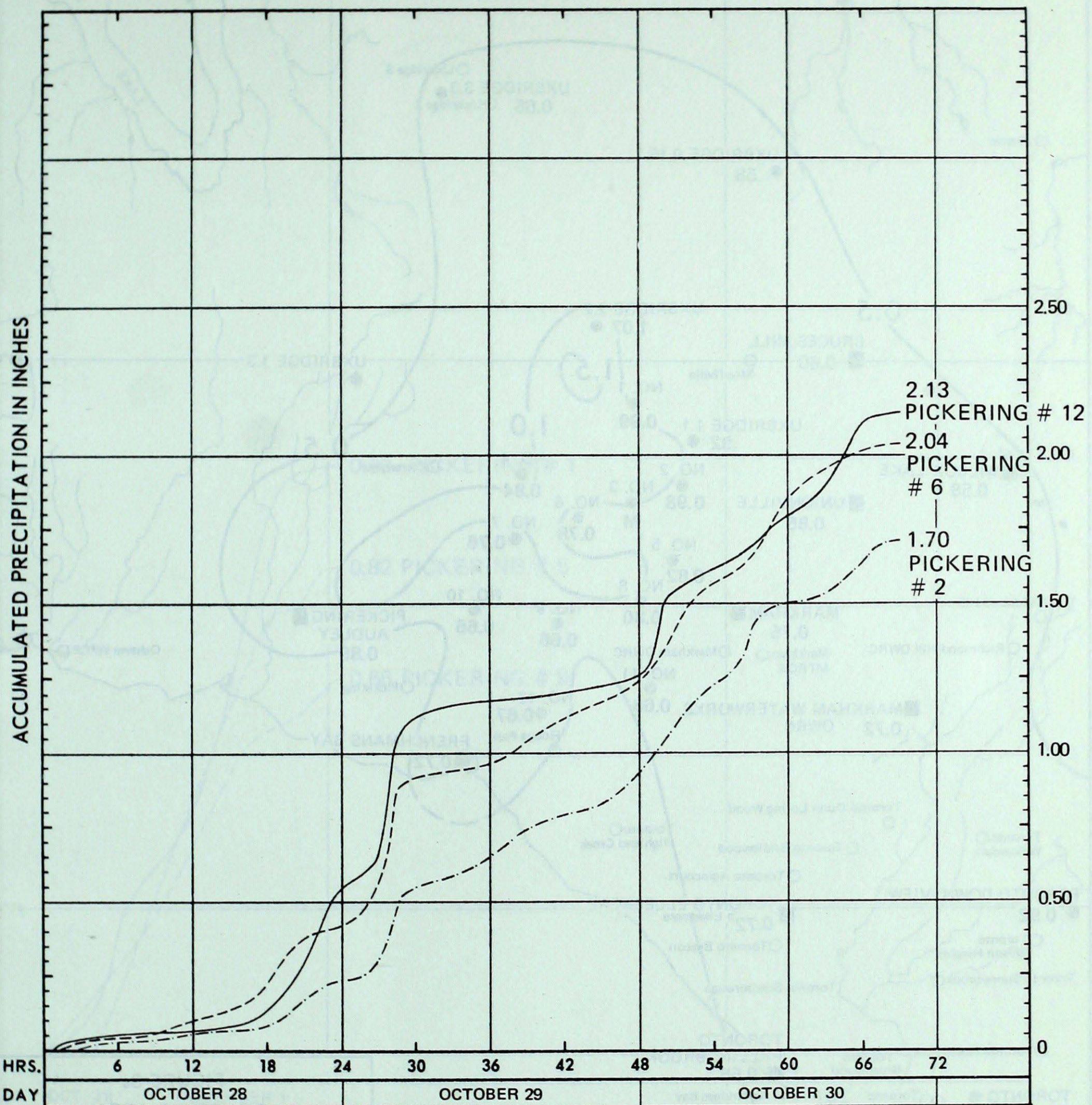
DURATION OF STORM: 3 HOURS

FROM AUGUST 20/73, 1200 LST TO AUGUST 20/73, 1500 LST

FIGURE 6b



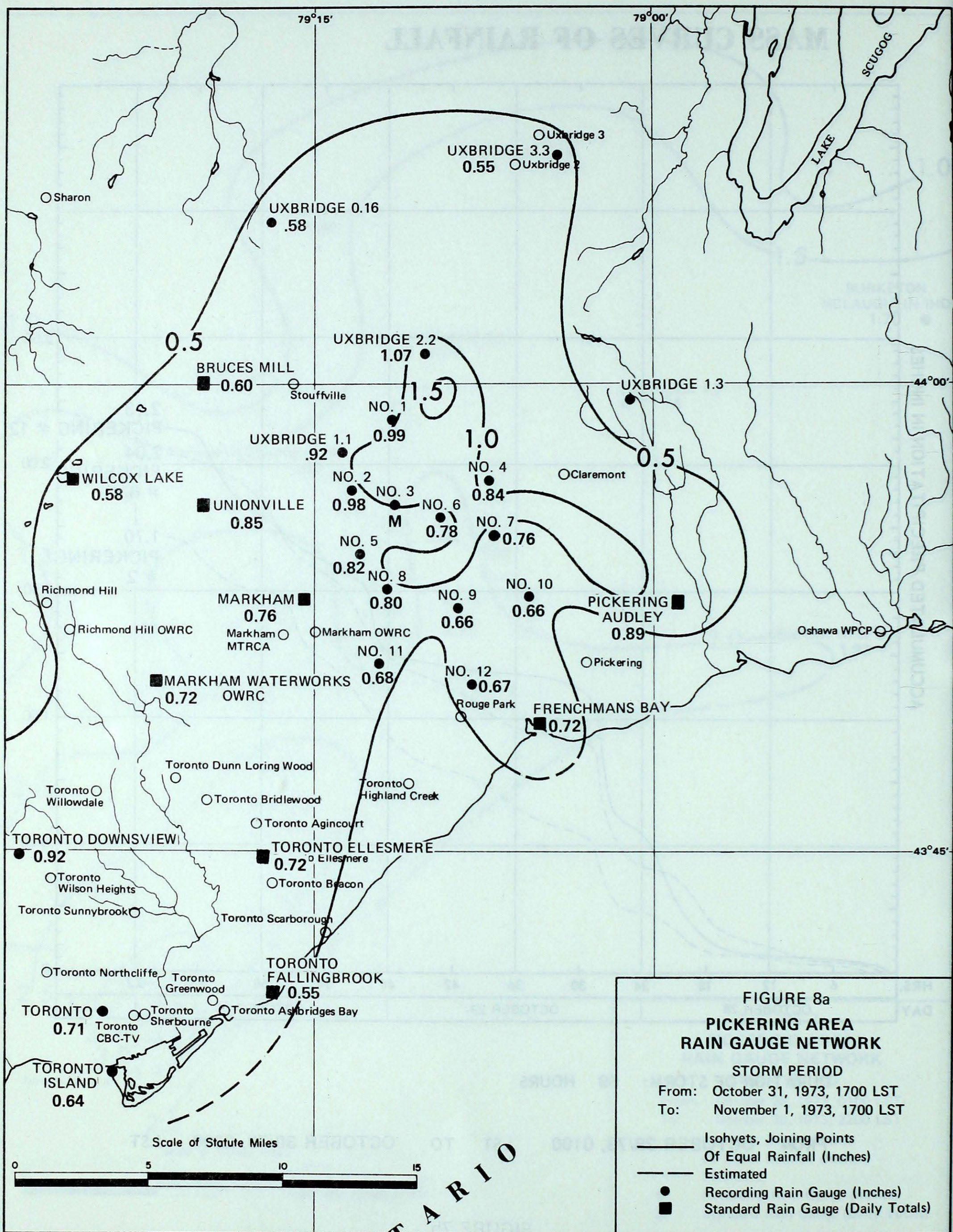
MASS CURVES OF RAINFALL



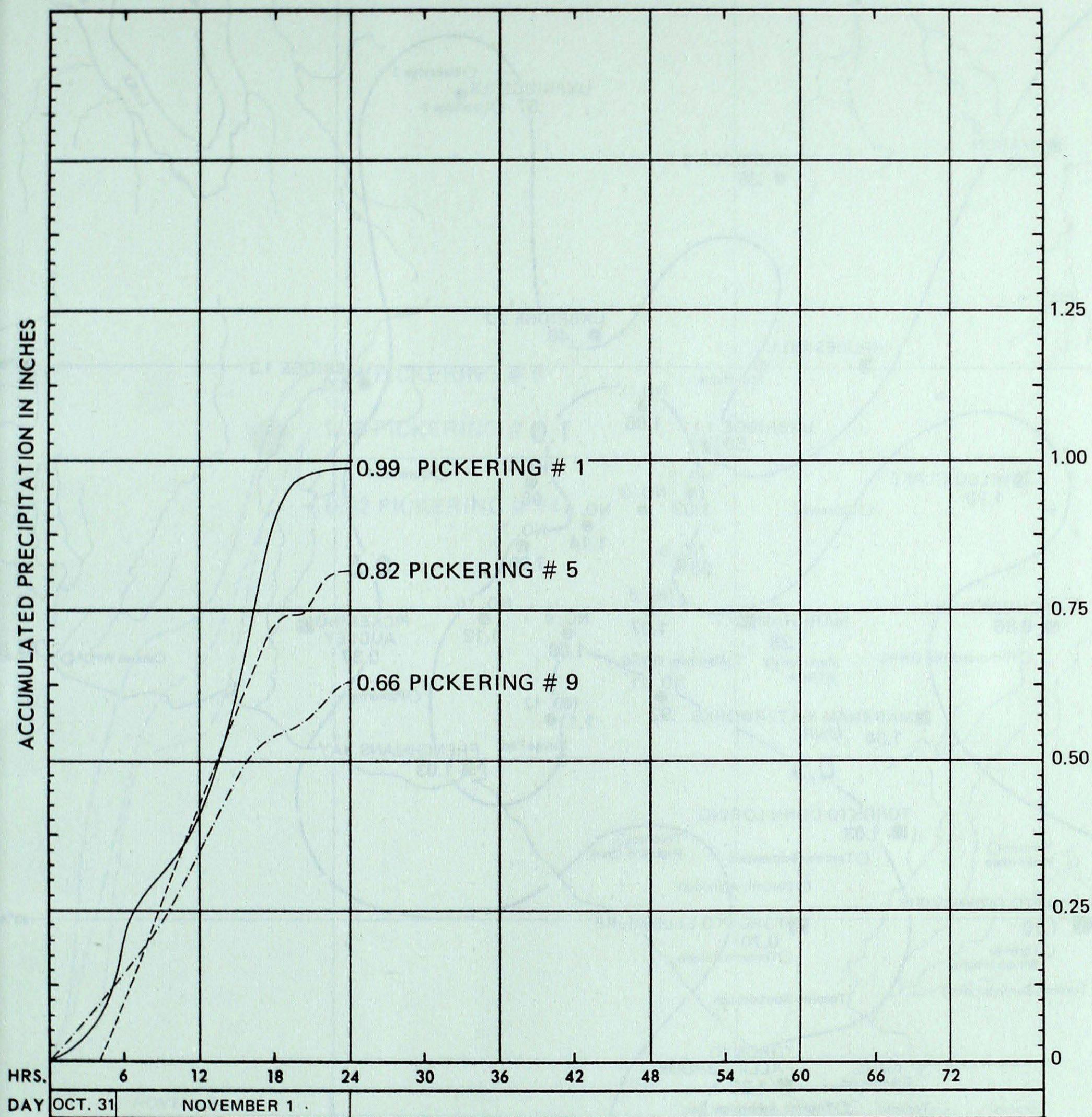
DURATION OF STORM: 69 HOURS

FROM OCTOBER 28/73, 0100 LST TO OCTOBER 30/73, 2200 LST

FIGURE 7b



MASS CURVES OF RAINFALL



DURATION OF STORM: 24 HOURS

FROM OCTOBER 31/73, 1700 LST TO NOVEMBER 1/73, 1700 LST

FIGURE 8b

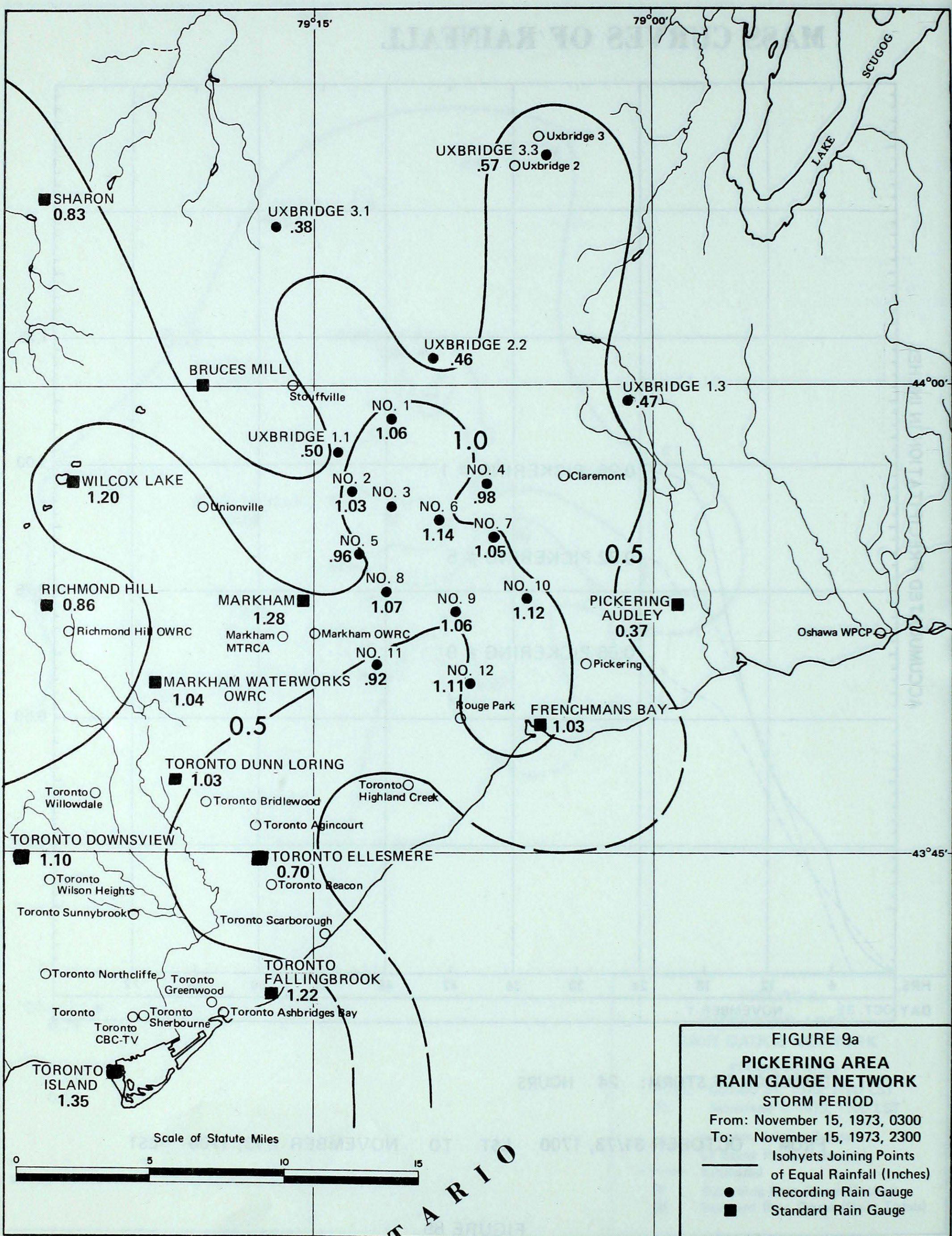


FIGURE 9a
PICKERING AREA
RAIN GAUGE NETWORK
STORM PERIOD

From: November 15, 1973, 0300
To: November 15, 1973, 2300

Isohyets Joining Points

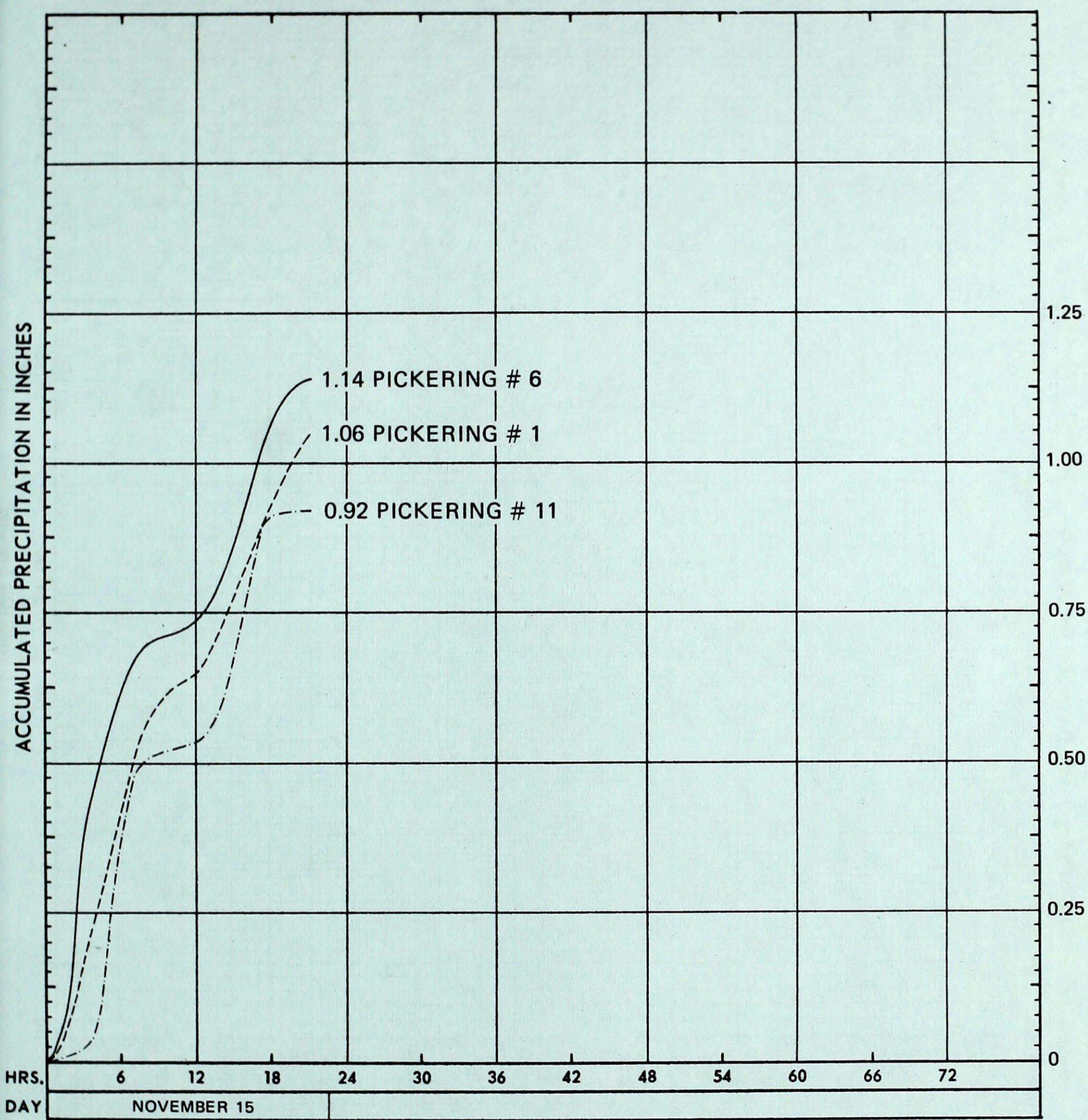
of Equal Rainfall (Inches)

Recording Rain Gauge

Standard Rain Gauge

— 1 —

MASS CURVES OF RAINFALL



DURATION OF STORM: 20 HOURS

FROM NOVEMBER 15/73, 0300 LST TO NOVEMBER 15/73, 2300 LST

FIGURE 9b

SHORT DURATION RAINFALL – INTENSITY – FREQUENCY DATA FOR Aurora (Oak Ridges) Ont.

1927–28, 1930–34, 1938

1940–43, 1945–48

BASED ON RECORDING RAIN GAUGE DATA FOR THE PERIOD

(16 years)

