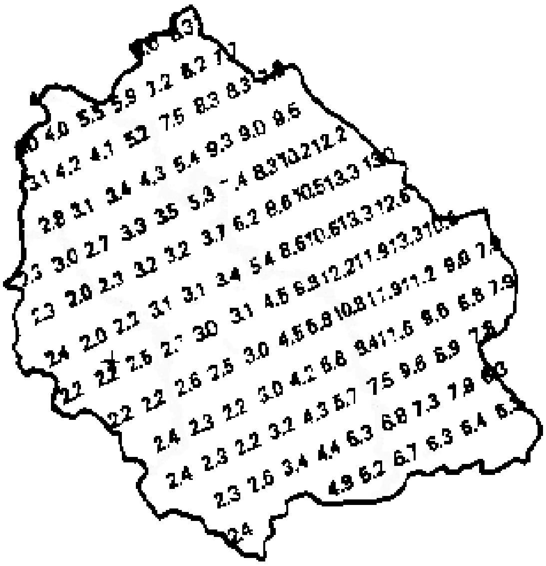

Figure 5.62. Grid of rainfall depth (inches) of Montana storm transposed over the Cheesman basin multiplied by the ratio of the grids of Figures 5.61 to 5.60

While severe local storms are reported frequently in Australia, adequate data from detailed rainfall analyses are possible for only a few. Maximum observed data from those for which a depth–area–duration analysis was possible are shown in Table 5.23. Excluded from consideration for this table are those storms that have occurred in the tropical and subtropical coastal strips. Table 5.24 provides data on notable point rainfall values for durations from a few minutes to several days. These data support the concept that rainfall potential for short durations and small areas is similar to the potential in the United States.

5.4.3 Use of GSDM depth–area–duration data

Synoptic meteorological analyses, together with observations by radar and satellite of severe storms in Australia, have permitted determination of areas of Australia subject to the use of adjusted United States depth–area–duration data (Figure 5.63). Between the zones where storm duration is limited to either 3 hours or 6 hours is an intermediate zone. The storm duration in this zone is determined either by linear interpolation between the other zones or by use of other meteorological analysis. The enveloping depth–area–duration curves (Figure 5.64) were developed using the highest recorded rainfall depths in the United States plus those of a phenomenal storm near Dapto in New South Wales (Shepherd and Colquhoun, 1985), adjusted to a common moisture charge, equivalent to a dewpoint of 28.0°C. Two sets of curves are provided: one is representative of smooth terrain and the other of rough terrain. Rough terrain is characterized as areas where elevation changes of 50 m or more within horizontal distances of 400 m are common. The rough category is intended for use mainly for basins on the windward slopes of steep hills facing the ocean.

The curves of Figure 5.64 are considered applicable to elevations below 1 500 m. Above this elevation, a reduction of 5 per cent per 300 m is applied.

5.4.3.1 Geographic variation

The curves of Figure 5.64 have been adjusted to a common moisture base, equivalent to a dewpoint temperature of 28.0°C. The extreme annual 24-hour persisting dewpoint temperatures over Australia have been used to create a dewpoint chart, and these dewpoint values were revised in 2001. This chart was then used to develop an index to adjust the depth–area–duration data for available moisture. The index was obtained by calculating the ratio of the precipitable water associated with the extreme annual dewpoint to that of the base dewpoint temperature of 28.0°C. A chart showing the reduction index is shown in Figure 5.65.

5.4.3.2 Distribution of PMP in time

The temporal distribution of the PMP should be based on extreme storms characteristic of the region (Figure 5.66). This distribution is patterned after the Woden Valley, Australian Capital Territory storm of 26 January 1971 and the Melbourne, Victoria storm of 17 February 1972. These two storms each resulted from severe thunderstorm cells.

Table 5.23. Notable observed depth–area–duration data (mm) for Australia (derived from data in Australian Bureau of Meteorology, 1985)

	0.5	*1.5*	*3*
1	114[c]	300[c]	
10	85[c]	99[b]	222[c]
50	72[c]	87[b]	195[a]
100	66[c]	78[b]	190[a]
500	49[c]	180[a]	
1 000	42[c]	170[a]	

[a] Storm of 20 March 1900, Molong, New South Wales
[b] Storm of 26 January 1971, Woden Valley, Australian Capital Territory
[c] Storm of 2 March 1983, Dutton, South Australia