WATER RESOURCES

OF THE

NAMOI VALLEY

SURVEY OF THIRTY TWO N.S.W. RIVER VALLEYS

REPORT Nº 16 — MARCH 1970

WATER RESOURCES OF THE NAMOI VALLEY

PREFACE

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MINISTER FOR CONSERVATION

NEW SOUTH WALES

In accordance with the policy of the New South Wales Liberal-Country Party Government announced prior to its election to office at the May, 1965 State Elections, I directed the Water Conservation and Irrigation Commission to undertake a survey of the State's water resources on an individual valley basis to enable the formulation of a balanced and soundly based programme of water conservation.

The survey, which is the largest and most comprehensive study of its type ever undertaken, has recently been expanded to cover the Murray and Darling Basins in their entirety. It involves the preparation of twenty eight reports covering thirty two major river valleys of the State.

In the survey, studies are being made of the physiography, climate, groundwater potential and surface water resources of each valley. In addition to reviewing current water requirements, assessments are being undertaken of possible future water development.

Reports are being prepared progressively and those issued to date have covered twenty major valleys and a number of minor valleys. This report on the water resources of the Namoi Valley is the sixteenth to be issued.

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March, 1970.

WATER RESOURCES OF THE NAMOI VALLEY

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WATER RESOURCES OF THE NAMOI RIVER VALLEY.

1. INTRODUCTION.

With the exception of air, water is the world's most vital natural resource. The abundance of this resource is evident when it is considered that over 74 percent of the area of the Earth is covered by oceans and polar icecaps whilst the remaining 26 percent, comprising the land masses, contains surface water supplies and is frequently covered by water vapour in clouds.

The overall amount of water on Earth has been estimated to be of the order of 320 million cubic miles and as each cubic mile is equivalent to about a million million gallons it is difficult to visualise the astronomical magnitude of this resource.

However the usefulness of the available water is severly limited as about 97.2 percent is in the oceans and a further 2 percent is stored in the polar icecaps. In addition as underground water comprises over 99.5 percent of the remaining 0.8 percent, the amount of fresh water contained in lakes and streams approximates to only 0.004 percent of the total volume of water on Earth.

The gross water resources of any country are normally considered to be the total amounts of precipitation, in the forms of rain, hail or snow, which fall on the land. The surface water resources are usually regarded as the amounts of water in rivers and lakes.

Of all the continents, Australia has the least annual rainfall, the average being only about 1½ feet whereas Africa, Asia, Europe and North America each receive about 2 feet whilst South America receives an average of almost 4½ feet. When losses due to the natural processes of evaporation, transpiration and seepage are deducted from the annual precipitations of the continents, comparison of the remainders (or surface water resources) shows that Australia has a comparative runoff much less than indicated by the average annual rainfalls.

The surface water resources of the Australian mainland have been assessed at about 240 million acre feet per annum which is equivalent to a depth of less than 2 inches over the continental area. In comparison runoffs for the other continents are about 7 inches in Africa, 9 inches in Asia and Europe, 11 inches in North America and about 19 inches in South America.

Huge demands are made in developed countries on water supplies for domestic, industrial and agricultural purposes. In the production of a ton of steel about 300 tons of water are used; about 2½ tons of water are required to grow the grain and produce a loaf of bread and a ton of paper requires about 60 tons of water. Furthermore it has been estimated that over thirty tons of water are required to produce a normal daily diet for an adult.

The annual water requirements of crops are usually of the order of two to three feet depth and during droughts it is necessary if losses are to be avoided, to supply the majority of this requirement by irrigation. The relative magnitude of this demand can be visualised when it is realised that application of a depth of three feet of water over only one acre corresponds to over 800,000 gallons (more than 3,500 tons).

In addition to the relatively low average annual runoff over the continent, Australian streams tend to exhibit considerable variability in flow. Therefore, it is necessary to construct relatively large water conservation storages if assured water supplies are to be maintained over the full period of a drought.

In view of the steadily increasing demand for water for irrigation, industrial and domestic purposes, the continued development of Australia as a nation will require the construction of many more large water conservation storages in the future. Furthermore, it will be necessary to ensure that the flows provided by these and existing storages are used effectively.

The water resources of a nation are of major importance to national economy, the welfare of the community depending to a large extent on their proper development and use. Water conservation in Australia is therefore a service of prime national importance, increasing living standards and overall national wealth.

The surface water resources of the Namoi River Valley excluding the Peel River catchment have been assessed as being of the order of 410,000 acre feet per annum. As the average annual rainfall over the valley is about 24 inches the surface water resources represent a runoff of only about 2 percent. On a square mile basis, the surface water resources of the Namoi Valley are less than one third of the average for New South Wales.

2. PHYSIOGRAPHIC FEATURES.

The Namoi River is one of the major tributaries of the Barwon- Darling Rivers system and drains an area of about 16,600 square miles extending from near Walcha westward to Walgett. Included in this area is the Peel River Valley which has an area of about 1,800 square miles.

However in view of the substantial nature and importance of the water resources of the Peel River a separate report has been prepared covering the Peel Valley. Consequently the area of the Namoi Valley as covered by this report and shown on Figure 1 is about 14,800 square miles.

The Namoi River rises as the Macdonald River in the extreme eastern section of the valley near the Black Sugarloaf Mountain at heights of over 4,500 feet above sea level. In its upper reaches above Bendemeer, the Macdonald River flows in a general north-westerly direction through a relatively narrow, forested valley bounded on the east by the Great Dividing Range and the Nandewar Range and on the west by the Moonbi Range.

Below Bendemeer the Macdonald River Valley broadens to provide extensive areas of useful pastoral land. About 25 miles downstream of Bendemeer the Macdonald River enters a gorge below which it is named the Namoi River and commences to flow in a general south-westerly direction.

About ten miles upstream from the town of Manilla the Namoi River is joined on its left bank by Halls Creek and emerges from the gorge country into a relatively wide valley characterised by mainly flat and undulating open country. Further downstream at Manilla the Namoi River is joined on its right bank by the Manilla River which drains the southern slopes of the Nandewar Range in the vicinity of Barraba.

Downstream of Manilla the Namoi River continues to flow in a general south-westerly direction and enters the storage of Keepit Dam. This dam which is situated about 15 miles east of the town of Gunnedah has a capacity of about 345,300 acre feet and is designed to provide a normal annual regulated flow at Gunnedah of 186,000 acre feet.

About 3 miles downstream of Keepit Dam the Namoi River is joined on its left bank by the Peel River. As indicated previously the Peel Valley which covers an area of about 1,800 square miles has been made the subject of a separate report.

Immediately upstream from Gunnedah the Namoi River is joined on its left bank by another major tributary, the Mooki River which rises in the Liverpool Range in the southern most extremity of the valley. Although the Mooki River flows through rugged country in its upper reaches the majority of the catchment, particularly west from Quirindi, is characterised by flat and gently undulating country.

From Gunnedah to Narrabri the Namoi River flows in a general north-westerly direction, being joined on its left bank by Coxs Creek and on its right bank by Maules Creek. This section of the valley is mostly flat and contains the fertile Liverpool Plains area.

Below Narrabri the valley is almost entirely flat with the boundaries between the adjacent Gwydir and Castlereagh Valleys being difficult to accurately define in some areas. Between Narrabri and its junction with the Barwon River near the town of Walgett, the Namoi River flows generally westward and becomes a slow moving stream featuring a number of billabongs, ana branches and effluent streams.

Bohena and Baradine Creeks which join the Namoi River on its left bank below Narrabri, drain the northern slopes of the Warrumbungle Range whilst between these two creeks, there are a number of smaller watercourses which drain the area known as the Pilliga Scrub. However due to the flat nature of the country through which they pass, these streams do not contribute significantly to the flow of the Namoi River in normal periods.

The main effluents of the Namoi River are Pian Creek and Gunidgera Creek which flow from the right bank of the Namoi River near the town of Wee Waa. Whilst Gunidgera Creek rejoins the Namoi River upstream from the township of Pilliga, Pian Creek flows to the north of Burren Junction through an extensive area in the extreme north western section of the valley, eventually rejoining the Namoi River about 10 miles upstream from its junction with the Barwon River.

The elevation of the Namoi Valley varies from over 4,500 feet on some of the higher areas of the Great Dividing Range and the Nandewar Range to less than 500 feet at the western extremity of the valley near Walgett. At several points on the Nandewar Range north west of Barraba the elevation is nearly 5,000 feet.

West of Narrabri the valley can be classified as almost entirely flat with land slopes less than three degrees. In addition from the junction of the Peel River, downstream of Keepit Dam, to Narrabri there are extensive areas of mostly flat land.

Details of the generalised land slopes in the valley are shown on Figure 2. As indicated on this plan about two thirds of the Namoi Valley may be classified as mostly flat with land slopes less than three degrees. The remaining one third of the valley is comprised of almost equal areas of undulating to hilly land with slopes between three and eight degrees, hilly to steep land with slopes between eight and fifteen degrees and rugged or mountainous terrain with slopes exceeding fifteen degrees.

Forests only occupy very limited areas in the valley and are mainly confined to the upland regions along the north, east and south-eastern boundaries. However, they are sufficient to support a timber getting and sawmilling industry.

The area dedicated as State Forests occurs mainly in the west of the valley near Pilliga. These areas represent about half the total area of dedicated State Forests within the Namoi Valley.

The predominant species in the western State Forests are Cypress Pine and Ironbark with Stringybark varieties occurring in some of the more easterly areas. Small areas of wet hardwood species are found in State Forests and natural woodlands in the south-east of the valley near Nundle.

The flat and undulating areas comprising the majority of the valley have been mostly cleared of natural vegetation to support cropping and livestock grazing. Scrubland occurs only in localised patches in the Pilliga area and a variety of natural grasslands occur on the plain areas in the west of the valley.

In the north eastern section of the valley drained by the Macdonald and Manilla Rivers, sheep grazing for wool and timber getting are the principal agricultural pursuits, with some dairying, cropping and poultry activities on the flatter areas.

Further west in the area surrounding Quirindi, Gunnedah and Boggabri, grazing and wheat growing are the main activities.

In the Narrabri - Wee Waa area cotton growing has been developed as a major activity whilst in the more western areas of the valley where water supplies are less plentiful, most farming is associated with sheep grazing for wool and meat production.

3. CLIMATIC FEATURES

Rainfall

Annual median rainfall over the Namoi Valley generally increases with elevation. Annual median rainfalls over the lowest section of the valley in the vicinity of the junction of the Namoi and Barwon Rivers are about 17 inches. Over the Warrumbungle, Liverpool, Great Dividing and Nandewar Ranges, annual median rainfalls exceed 25 inches generally and are greater than 35 inches in the vicinity of Mt. Lindsay, whilst over the higher peaks of the Great Dividing Range in the east, annual median rainfalls exceed 45 inches.

These ranges form the semi-circular shaped boundary of the eastern section of the river system and they produce a slight shadowing effect on rainfall over the lower reaches of the Manilla and Mooki Rivers and Coxs and Bohena Creeks where annual median rainfalls are only slightly higher than 20 inches. (The median is that rainfall which is equalled or exceeded on fifty percent of occasions). The distribution of annual median rainfalls is shown at Figure 3 whilst the monthly median rainfall distributions which follow a similar pattern to the annual distribution are shown at Figures 4 to 15.

The monthly rainfall distribution throughout the year is bimodal with a primary maximum of about 12 percent of the annual rainfall occurring in either January or December. A secondary maximum which occurs in June amounts to about 9 percent of the annual average. On the average the months May and August receive the lowest rainfall of about 6 percent of the annual rainfall. Median rainfalls vary over the region from 4 to 1½ inches in January and 3½ to ¾ inches in August.

Records of monthly and annual rainfalls at Walgett, Baradine, Wee Waa, Narrabri, Boggabri, Gunnedah, Barraba, Mt.Lindsay and Millers Creek are given in Appendices 1 to 9 inclusive.

Very high monthly totals as recorded on the eastern slopes of the Great Dividing Range do not extend into the Namoi Valley. The highest monthly totals on record for stations in the catchment are from 10 inches in the north to about 20 inches in the east and usually occur in the months December, January or February when active depressions form to the north of the river basin. These depressions, which cause a moist northerly airflow west of the Great Dividing Range usually form in a trough extending from north of the continent to south-eastern Australia. Under these conditions high daily rainfalls may result.

The tables at Appendix 10 show on a monthly and yearly basis for Walgett, Baradine, Wee Waa, Narrabri, Boggabri, Gunnedah, Barraba, Mt. Lindsay and Millers Creek the following data:-

(1) The highest and lowest rainfall totals on record;

(2) The 10th, 30th, 50th, 70th and 90th percentiles.

(A rainfall observation less than the 10th percentile value can be expected once every ten years on the average. Similarly, a rainfall observation less than the 70th percentile can be expected in seven years out of ten or, alternatively, a rainfall observation greater than 70th percentile can be expected on an average of three years in ten).

Tables showing the minimum cumulative rainfalls on record commencing in any month of the year and continuing for up to 12 months, at Walgett, Baradine, Narrabri, Boggabri, and Gunnedah are given at Appendix 11.

Dry spells occur over the basin from time to time. These spells may occasionally be prolonged and severe over the western half of the basin. At Walgett less than 5 inches of rain has been received in a 12 month period; while on an average of one year in ten, totals of less than 12 inches in any consecutive 12 month period have been recorded. The corresponding median value is 18 inches. The effect of dry spells over the eastern sector of the region is partly reduced as rainfall is approximately double that received in the extreme western areas.

Temperature

The temperature regime of the basin is represented by the following stations:-

(1) Quirindi, representative of the area of the valley having an elevation of about 1,500 feet.

(2) Gunnedah, representative of the area of the valley having an elevation of about 1,000 feet.

(3) Walgett, representative of the area of the valley having an elevation of below 500 feet.

Monthly and annual average temperatures for these three stations are given in Tables 1, 2 and 3.

TABLE 1.

QUIRINDI (Elevation 1279 feet)

Average Temperature (°F) based on 30 years of Record.

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
Average Maximum	90.2	89.3	85.3	76.3	68.3	61.1	59.9	63.7	70.9	78.1	85.1	88.6	76.4
Average Minimum	75.8	74.6	70.2	61.6	54.4	48.4	47.2	49.6	55.5	62.2	69.3	73.3	61.8
Average Daily	83.0	81.9	77.7	68.9	61.3	54.7	53.5	56.7	63.2	70.1	77.7	80.9	69.1
	Highest on Record: 114.0°F						Lowest on Record: 13.0°F						

TABLE 2.

GUNNEDAH (Elevation 876 feet)

Average Temperature (°F) based on 27 years of Record.

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
Average Maximum	95.2	93.5	88.6	79.5	70.5	63.4	62.2	65.5	73.0	80.8	87.9	93.0	79.4
Average Minimum	64.9	63.6	59.2	50.9	43.2	38.1	36.6	38.2	43.0	49.9	57.1	61.0	50.5
Average Daily	80.1	78.5	73.9	65.2	56.9	50.7	49.4	51.9	58.0	65.3	72.5	77.0	64.9
	Highest on Record: 117.0°F						Lowest on Record: 19.0°F						

TABLE 3.

WALGETT (Elevation 436 feet)

Average Temperature (°F) based on 27 years of Record.

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
Average Maximum	95.2	94.0	88.9	79.9	71.4	64.3	63.1	67.6	74.9	82.7	89.0	92.7	80.3
Average Minimum	68.5	68.1	63.0	54.2	46.5	41.7	40.6	42.0	47.4	55.1	61.5	66.4	54.6
Average Daily	81.8	81.1	75.9	67.1	59.0	53.0	51.9	54.8	61.2	68.9	75.3	79.6	67.5
	Highest on Record: 122.2°F						Lowest on Record: 23.0°F						

Very hot days are experienced on occasions in the summer months, particularly over the western half of the valley. Walgett experiences on average, temperatures greater than 100°F. on about 26 days per year whilst over the higher parts of the catchment, the frequency is somewhat lower, being about 12 days per year at Gunnedah and 8 days per year at Quirindi. The highest temperature on record for the catchment is 122.2°F. at Walgett.

On calm, clear nights during winter very low overnight temperatures are common, particularly over the higher parts of the region. Temperatures lower than 36°F. occur about 36 times per year at Walgett, 43 times per year at Gunnedah and 73 times per year at Quirindi on the average.

Extreme temperatures of 23°F. or lower have occurred over the whole Namoi Valley whilst at Quirindi an extreme temperature of 13°F. has been recorded.

Frosts

Frost occurs over the entire basin in the cooler months of the year. The average season extends from June to September inclusive over the western boundary and increases to a season extending from April to October inclusive over the more elevated regions of the valley.

Severe frosts are usually confined to the months of July and August over the lower reaches and May to September inclusive over the headwater areas, average frequencies ranging from 10 to more than 50 per year over the abovementioned areas respectively.

Sunshine

Estimates of the number of hours of bright sunshine per day for the headwater, central and lower areas of the valley are shown in Table 4. These estimates are based on cloud amount observations.

TABLE 4

Estimated Average Duration of Bright Sunshine in Hours per Day

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
Head-water Areas	9.7	8.8	8.5	7.7	6.8	6.0	6.3	7.4	8.3	8.7	9.8	9.8	8.2
Central Area	10.2	9.3	8.9	8.3	7.4	6.3	7.0	7.9	8.7	9.2	10.3	10.3	8.6
Lower Area	10.5	9.9	9.2	8.8	7.9	7.0	7.7	8.4	9.0	9.7	10.7	10.7	9.1

Evaporation.

Estimates of the average monthly and annual evaporation from an Australian standard sunken tank for the headwater, central and lower areas of the valley together with estimates of the appropriate standard deviations are shown in Table 5. These estimates are based on radiation, air temperature and humidity considerations.

TABLE 5

Estimated Average Monthly and Annual Evaporation in Inches

Region	Statistic	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
Head-water Areas	Evaporation	7.0	5.2	4.8	3.3	2.7	1.7	1.4	2.5	3.1	4.1	6.0	7.0	48.8
	Standard Deviation	1.0	0.9	0.8	0.5	0.3	0.3	0.3	0.4	0.6	0.8	1.1	1.2	5.2
Central Area	Evaporation	8.5	6.0	5.8	4.2	2.9	1.9	1.6	2.8	3.6	5.0	6.9	8.1	57.3
	Standard Deviation-	1.2	1.2	1.0	0.6	0.4	0.4	0.4	0.5	0.8	1.0	1.3	1.5	6.6
Lower Area	Evaporation	11.0	7.0	6.8	4.8	3.1	2.2	1.9	3.0	4.1	6.0	8.0	9.2	67.1
	Standard Deviation	1.4	1.3	1.2	0.8	0.5	0.4	0.4	0.6	0.9	1.1	1.4	1.6	7.9

Wind

Wind speeds over the river basin are mainly light or moderate. Violent gusts however, may be experienced over limited areas in association with thunderstorms or active cold fronts. The extreme wind gusts likely to be experienced in association with these phenomena at any given point in the basin for various return periods are shown in Table 6 for the eastern and western regions of the Namoi Valley.

TABLE 6

Estimated Extreme Wind Gusts to be expected with given Return Periods.

Return Period (Years)		10	20	50	100
Extreme Wind Gust Equalled or Exceeded (miles per hour)	Eastern Region	75	80	90	100
	Western Region	70	75	85	90

4. GROUNDWATER POTENTIAL

The Namoi Valley is a large complex area with elevated country to the south and east, giving way to wide river flats in the south-western and central regions and opening out to extensive riverine plains to the west.

The upstream region of the Namoi Valley illustrates the effect of geological structure on alluvial deposition. This area is crossed by a zone of major faults which trend north-north-west and cross the valley in the vicinity of the junction of the Namoi and Peel Rivers. The uplifted eastern block forms an abrupt margin to the Breeza and Liverpool Plains, with Devonian and Carboniferous rocks occurring to the east and younger Permian and Mesozoic rocks appearing to the west.

Upstream of the fault zone, the drainage systems are entrenched and the development of alluvium is restricted in both depth and width. Because of this, the Namoi Valley in this area has relatively minor groundwater potential.

That part of the Namoi River system lying west of the fault contrasts sharply with that to the east. In the western section the topography is mature and the alluvium both extensive and deep. The groundwater potential of much of this area is considerable and fairly intensive development of groundwater for irrigation use is being carried out at present.

The rocks occurring in the Namoi catchment are many and varied but for the purpose of this discussion they are divided into the following three categories:

(a) jointed or fissured rocks;

(b) porous rocks;

(c) unconsolidated material or alluvium.

The geological formations, as shown in Figure 16, range from Jurassic to Silurian in age and are part of a large anticlinal structure with a north-north-west trend. The older rocks outcrop in the eastern part of the valley giving way to younger rocks in sequence to the west where the Jurassic rocks occur.

The rock types in the valley range from steeply dipping Silurian metamorphics and sediments; through tuffs, lavas, shales, sandstones etc. of Devonian and Carboniferous age; sandstones, shales and coal seams of Permian age; to the flat-lying or gently dipping Triassic and Jurassic sandstones and shales to the west. Granites occur to the east in the Macdonald River catchment and basalts outcrop extensively around the southern, south-western and north-eastern margins of the valley.

(a) Jointed Rocks

Water is contained in these rocks in openings caused by any joints, partings, fractures etc. which may be present. The size and distribution of these openings and the rock type and topography are the main factors controlling the depth, yield and quality of underground water supplies.

The Silurian rocks outcrop in the eastern part of the valley and consist mainly of slates, phyllites, quartzites and andesites. There are few bores recorded in these rocks in this area, but those that are known give similar results to bores under similar conditions in other parts of the State. Stock supplies are usually obtained between 100 and 200 feet at selected sites which are normally in the lower areas and along drainage lines. The water quality is rather variable, but is normally suitable only for stock use.

The Devonian rocks, which occupy the central part of the north-eastern section of the valley, consist of shales, cherts, tuffs, sandstones, limestones etc. Numerous bores have been construction in these rocks. The majority yield stock supplies of water at depths varying from 50 to 200 feet whilst the average depth is about 100 feet. The variation in depths is due to the differences in topography and geology at the various sites. Some bores have been recorded as failures from 68 to 150 feet in depth, usually due to hard rock conditions, particularly in elevated sites.

Carboniferous rocks consist mainly of tuffs, lavas, shales, etc. and occur to the west, and also in a small belt to the east, of the Devonian strata. They also form the eastern flank of the southern part of the valley. Stock supplies are normally obtained at a depth of the order of 100 feet, but the recorded bores vary from 60 to 260 feet in depth. The water is commonly brackish but should be suitable for stock use. Some bores in the tuffs or lavas have failed to obtain supplies at depths ranging from 100 to 230 feet deep but most of the bores have been successful.

Permian rocks occupy a belt trending in a north-westerly direction to the west of the main fault zone. They are mainly sandstones and shales with coal seams and interbedded lavas and contain both marine and fresh water sediments. The igneous section is represented by the Werrie basalts and Warrigundi instrusives in the Quirindi area and the Boggabri volcanics near Gunnedah and Boggabri.

Stock supplies of water are usually obtained in bores at depths of 100 to 200 feet. Due to the large variety of rock types and topography associated with the Permian strata, considerable variations in depth, water quality and yields occur. In the hard phases of the volcanics and intrusives some unsuccessful bores have been sunk to depths up to 355 feet. In the Lower Coal Measures, which form elevated country in the headwaters of the Namoi River, a number of bores are recorded up to 525 feet in depth yielding stock supplies. Bores in this area are generally deeper than in the less elevated areas. However one bore was continued to 975 feet in shale, slate and basalt without obtaining a suitable supply.

The quality of water from bores in the Permian rocks is usually rather poor and only suitable for stock use. This is particularly the case in the Coal Measures and Marine Series.

Adjoining the Permian formations to the west are sandstones, shales, conglomerates etc. of Triassic age. These are generally horizontal or gently dipping. In the northern part of the valley, they have a gentle dip to the west or north-west, whilst to the south of Gunnedah they form the northern flank of the Oxley Basin and dip to the south. The prospects of successful boring in Triassic Series are only fair, and a large number of

the recorded bores are failures, these bores having been sunk to depths from 300 to 700 feet mainly in shale and sandstone.

Successful bores have been recorded at depths of from 150 feet to 650 feet in sandstone. Deep boring has been undertaken in places, one bore 1,005 feet deep striking a stock supply of water at 960 feet in sandstone and another reaching a depth of 1,953 feet.

The number of unsuccessful bores in these rocks is apparently due to a predominance of thick shale beds in many areas. The sandstone layers which could be expected to be aquifers, tend to be of low permeability and are thin and discontinuous. These Triassic sandstones could be either jointed or porous, but due to the low yields, are here related to the jointed rocks. In the Narrabri area, large supplies are obtained from what are tentatively termed Triassic sandstones, but there is some conjecture about this and they may in fact be Jurassic.

Jurassic rocks cover much of the south-western part of the Namoi Valley. They consist mainly of a sedimentary section of sandstones, shales and conglomerates which are considered in the sub-section dealing with porous rocks, and interbedded lavas. The lavas with associated intrusives, in which the main groundwater control is jointing, are widely distributed in the Mullaley area.

Stock supplies of water are usually obtained in bores and wells at selected sites in the lavas at depths of 50 to 200 feet. However, a number of bores at depths from 94 feet to 246 feet have been recorded as failures mainly as a result of poor selection of sites or the abandonment of sites because of hard rock conditions.

Granites outcrop in the elevated eastern part of the catchment. Although few bores are recorded in this area, stock supplies have been obtained from several bores at depths of 33 feet to 190 feet in decomposed and hard granite. Results of boring in similar granite areas in neighbouring regions suggest that the prospects of obtaining stock supplies are good if bore sites are chosen in the lower areas and shallow hard rock is avoided where possible.

Tertiary basalts occur as cappings in elevated country, mainly in the north-east and south-east margins of the watershed. Boring in these rocks is usually successful if the higher areas are avoided and sites are selected in the drainage lines. A number of bores are recorded yielding stock supplies of water at depths of 50 to 150 feet. Some have been successful as deep as 275 feet but a number of failures are known particularly in elevated country, at depths in excess of 300 feet.

Serpentine appears in a long narrow belt and as thin scattered outcrops in the north-eastern part of the valley. From a groundwater viewpoint it behaves in a similar fashion to the Silurian slates and phyllites which it adjoins. Stock supplies of water are usually obtained in bores at selected sites at a depth of the order of 100 feet. Due to their small areal distribution, these rocks have only minor groundwater significance.

(b) Porous Rocks

The main representatives of the porous rocks in this area are the Jurassic Pilliga sandstones. These rocks cover a considerable part of the central and western sections of the valley and are part of the intake beds for the Great Artesian Basin in the areas to the north and south of Narrabri. Stock supplies of water are normally obtained at depths of 100 to 300 feet but there is considerable variation in depth according to the elevation of the site and the distance from the intake or outcropping section of the sandstone beds.

In the western part of the valley the sandstones have a west to north-west dip and thus become deeper westward along the valley. Artesian flows are obtained from bores tapping these sandstones in the area from west of Narrabri, where they are several hundred feet deep, to Walgett where they are several thousand feet in depth. Although relatively large yields are obtained from this source, the water tends to have a high residual alkalinity which renders it unsuitable for irrigation.

Irrigation supplies are obtained in the porous sandstones to the north of Narrabri and also to the south of Spring Ridge. The bores in the Narrabri area range from 310 feet to 755 feet yielding 7,000 to 27,000 gallons per hour. The water is generally high in residual alkali and careful use is necessary to prevent soil and crop damage.

In the Spring Ridge area supplies of from 5,000 to 37,000 gallons per hour have been recorded from the sandstones at depths of 135 to 256 feet and the water is being used for irrigation. There is no information available regarding the effect of continuous pumping on these bores and it is not known whether the stated supplies can be considered permanent. One bore in sandstone in the Quia area was tested at 30,000 gallons per hour but after pumping continuously for some weeks the supply dropped to about 7,000 gallons per hour.

(c) Alluvium

The alluvium of the Namoi Valley has probably the greatest overall groundwater potential of any prospective source in New South Wales, the area of alluvium being the most extensive of any of the State's inland flowing rivers. However not all of the alluvium is favourable for the production of large groundwater supplies.

That part of the drainage system to the east of, or upstream of the fault zone near the junction of the Peel and Namoi Rivers is entrenched into the uplifted land surface and the alluvium is restricted both in width and depth. For this reason the groundwater potential in this region is minor, although very useful supplies are available in localised areas. The alluvium along the Namoi and Manilla Rivers in this region probably does not exceed 45 feet in depth and few irrigation supplies are recorded. Yields of up to 20,000 gallons per hour were obtained from wells at depths to 43 feet.

Numerous irrigation supplies have been recorded from wells along the smaller creeks and tributaries such as Halls Creek, Wongo Creek and the Upper Manilla River. Supplies of from 5,000 to 30,000 gallons per hour have been obtained from depths of 15 to 32 feet. Several wells which were sunk in 1966 on Wongo Creek were tested to yield 15,000 to 30,000 gallons per hour at depths of 18 to 27 feet. This suggests that the 1966 drought conditions did not have as drastic an effect on the groundwater supplies in this region as in other shallow alluvial areas in New South Wales.

The alluvium on the Macdonald River is also shallow and does not appear to have large groundwater potential. It is possible that limited irrigation supplies may be obtained in localised areas by constructing batteries of spearpoints in the sandy bed of the river or on the low flats.

The alluvial areas west of the fault zone show a marked change due to the flats becoming more extensive and the alluvium increasing in depth to over 500 feet to the north-east of Gunnedah. The groundwater potential as a result is increased enormously and irrigation bores and wells become relatively common indicating the development of the use of groundwater for irrigation which is taking place in the area.

In the area from Carroll to Gunnedah, the river flats are about 8 miles wide and a number of irrigation wells and bores are recorded. To date the majority of supplies have been encountered between 50 and 150 feet and yields have ranged from 15,000 to 30,000 gallons per hour.

However, a series of investigation bores to the north of Gunnedah indicated that the alluvium reaches a maximum depth of about 530 feet about 5 miles north east of the town. The deep aquifers encountered in this investigation were not free yielding and no substantial irrigation supplies were obtained below 100 feet. However, this does not mean that better aquifers are not present at these depths in other parts of the alluvial flats.

Tulcumba Creek joins the main flats of the Namoi Valley to the north of Gunnedah. The flats on this creek are up to 4 miles wide and the alluvium is in excess of 200 feet in depth. Irrigation supplies of from 7,000 to 28,000 gallons per hour have been obtained at depths of 110 to 172 feet from this alluvium. However the deposition of gravels in this area appears to have been rather variable.

The Mooki River joins the Namoi River at Gunnedah and drains a large area of elevated country to the east of Quirindi and along the Liverpool Range. There are extensive areas of alluvium along the Mooki River and its tributaries Quirindi, Warrah and Yarraman Creeks but these are interspersed with numerous outcrops of Jurassic sandstones and basalts. Stock and irrigation water supplies are obtained from shallow wells and bores in the upstream sections of these streams.

Where the flats are more extensive, the alluvium becomes much deeper and substantial irrigation supplies are obtained in many places along the Mooki River and the downstream section of Quirindi Creek. The maximum depth of alluvium in these areas is probably of the order of 300 feet but the majority of existing bores are from 100 to 150 feet in depth. It is likely that with deeper exploration, deeper gravels and larger supplies will be located, for in several parts of this area yields in excess of 1,000 gallons per minute have been obtained.

Coxs Creek which drains a large area along the Liverpool Range and other elevated country to the west of the Mooki watershed, joins the Namoi River at Boggabri. The conditions along the creek are rather similar to those along the Mooki River but the flats are not as extensive. Irrigation supplies are obtained from gravel beds along the creek and its tributaries.

A number of bores have been recorded in this region at depths of 50 feet to 105 feet, with yields ranging from 8,000 to 30,000 gallons per hour. The water obtained tends to have a high residual alkali content but in most cases with careful use it is suitable for irrigation.

Downstream of Mullaley, outcrops of sandstone and basalt occur in the flats and the gravel beds appear to be scattered and discontinuous. Irrigation supplies are obtained in places although the overall potential of this area is probably restricted by shallow bedrock.

The area adjacent to the Namoi River between Gunnedah and Boggabri contains extensive alluvial flats up to 10 miles in width. There is little existing development on the left bank, the few recorded bores being less than 100 feet deep and the yields from 17,000 to 25,000 gallons per hour. There are more bores on the right bank of the river but the majority of these are less than 100 feet in depth with yields up to 25,000 gallons per hour. Several large diameter gravel envelope bores have been recently constructed near Boggabri to depths of 300 feet and the supplies are stated to be several thousand gallons per minute. Considerable development of groundwater resources will probably occur in this area in the near future.

The alluvium in this section of the valley near Boggabri has a maximum depth of the order of 500 feet. Deep gravels have been shown to be present and larger supplies than are currently available could be obtained by exploiting these aquifers. Problems may be experienced with high salinity and alkalinity in some areas.

In the vicinity of Boggabri, supplies up to 45,000 gallons per hour are obtained at depths from 43 to 133 feet. Several miles downstream of Boggabri, the flats become very narrow and this restriction in width continues as far as Narrabri. Irrigation supplies are recorded in this area in several wells and bores at depths of 21 to 99 feet. Although considerable potential exists in this region, little overall development appears to have taken place.

Maules Creek, the main tributary joining the Namoi River in this area, drains a large area of elevated basalt country in the western part of the Nandewar Range. The alluvium in this catchment is apparently shallow, but irrigation supplies are obtained from wells and shallow bores for a distance of about 20 miles along the creek flats. The depths of the wells and bores have varied from 20 to 35 feet whilst the yields have ranged from 12,000 to 20,000 gallons per hour. In prolonged dry periods, the groundwater supplies in the upstream part of Maules Creek would probably be considerably reduced.

Between Narrabri and Walgett the Namoi River flows through extensive flood plains. The Namoi River has followed many courses through this area, as evidenced by the widely dispersed gravel beds which are now being located by boring.

As a result of the advent of cotton growing below Narrabri and the recent prolonged drought conditions in 1964 to 1966 large scale development of groundwater for irrigation use has occurred in this region. The introduction of new drilling techniques and the use of deeper aquifers have resulted in larger supplies than had generally been obtained previously. The majority of these bores are constructed as "gravel envelope" bores and all significant water supplies are usually allowed to enter the bores by slotting the casing or screening opposite each aquifer.

Numerous irrigation bores have been constructed in the area from Narrabri to Burren Junction but these are mainly located in the vicinity of Wee Waa. The supplies from these bores range up to 4,000 gallons per minute and the depths average about 300 feet. Test boring is usually required to determine if suitable aquifers are present at any particular site before the construction of an irrigation bore. This is necessary as the river was active across a wide area during the formation of the flood plain and the deposition of the gravels has been rather variable.

To the west of Wee Waa, irrigation supplies have been obtained from bores located over a distance of 20 miles across the valley. The downstream limit of irrigation supplies is not yet known but is probably in the vicinty of Burren Junction.

The effect of the intensive use of groundwater for irrigation in the Narrabri-Burren Junction area is being kept under careful observation in order to avoid undue depletion of the available resources.

West of Burren Junction, stock supplies of water are usually available in bores in the alluvium at depths of 70 to 250 feet. In some cases, particularly in the western section, the water is rather saline and may even be unsuitable for stock use.

Summary

The Namoi Valley may be divided on the basis of geological structure into two distinct divisions.

A zone of major faults runs in a north-north-west direction roughly through Quirindi and Carroll. The rivers and creeks upstream of the fault are entrenched and the alluvium is restricted in width and depth. Stock supplies of water are normally available on the flats with rather limited irrigation supplies usually being obtained in the downstream sections of the streams.

Stock water supplies are normally obtained in various jointed rocks outcropping in this area, at depths of 50 to 250 feet, but very hard phases of the rocks and elevated sites should be avoided.

To the west of the fault zone, the alluvium becomes more extensive and much deeper. Stock and limited irrigation supplies are obtained from wells and bores in the upstream sections of the tributary creeks, and irrigation supplies from bores in their central and downstream sections. Irrigation supplies are also available in many places along the Namoi River as far as Burren Junction. The yields depend on the type, depth and thickness of aquifers present and the techniques used to exploit them. Bores in the Wee Waa area average about 300 feet in depth and yield up to 4,000 gallons per minute.

Stock supplies of water are usually available in the jointed and porous rocks in this area except in the Triassic rocks where the prospects of success are only fair.

Irrigation supplies up to 30,000 gallons per hour have been obtained in porous sandstones in two areas and further exploration may show that conditions favourable for obtaining such supplies are more widespread than they are thought to be at present.

5. STREAM GAUGING STATIONS

In the appraisal of schemes involving the control and utilisation of streamflows, safer and more economical designs can be prepared if reliable streamflow data is available over a long period of time. Such long period records enable detailed studies to be made of severe droughts and extreme floods.

It is therefore the policy of the Water Conservation and Irrigation Commission to maintain a comprehensive network of suitably equipped stream gauging stations throughout New South Wales. At the present time the Commission is operating about 550 such stations in the State and this figure is being progressively increased.

Records of streamflow are derived from stream height data which is obtained either by regular visual reading of a staff gauge or from the continuous records of an automatic water level recorder. Each gauging station is calibrated by taking a series of actual measurements of the discharge at different gauge heights, the calibrations being checked and amended as necessary by further periodic discharge measurements.

The individual discharge measurements involve the use of a current meter to measure velocities across the stream in feet per second. After using survey methods to measure the effective area of flow in square feet, the discharge of the stream in cubic feet per second or cusecs, may be computed.

The measurement of flow in the Namoi Valley commenced in 1891 when a gauging station was established on the Namoi River at Gunnedah. Further gauging stations were installed in 1892 on the Namoi River at Narrabri and Walgett but the station at Walgett was subsequently discontinued in 1931.

No additional gauging stations were installed in the valley until 1911 when the collection of records was commenced for Narrabri Creek at Narrabri. The installation of stations on the Namoi River at North Guerindi, Keepit and Rimbah followed in 1915, 1923 and 1924 respectively.

Since 1924 a number of additional stream gauging stations have been installed in the Namoi Valley. The present total of 27 stations, which are all operated by the Water Conservation and Irrigation Commission in the valley, includes the original stations at Gunnedah and Narrabri.

The locations of existing and discontinued stream gauging stations in the Namoi Valley at 31st December 1968 are shown at Figure 17 whilst relevant details for the stations are given in Table 7.

TABLE 7.

Stream	Station	Catchment Area (Square Miles)	Type of Gauge	Period of Operation
Macdonald River	Cobrabald	138	Pressure Recorder	1965 to date
Macdonald River	Rimbah*	270	Staff Gauge	1924 to 1928
Macdonald River	Woolbrook	320	Pressure Recorder	1927 to date
Macdonald River	Bonnie Doon	434	Pressure Recorder	1968 to date
Namoi River	Retreat	680	Pressure Recorder	1965 to date
Namoi River	North Guerindi	970	Float Recorder	1915 to date
Halls Creek	Ukolan	150	Pressure Recorder	1965 to date
Manilla River	Barraba	219	Staff Gauge	1965 to date
Manilla River	Woodsreef	530	Staff Gauge	1965 to date
Manilla River	Tarpoly	637	Manometer Servo Pressure Recorder	1968 to date
Manilla River	Wimborne*	760	Staff Gauge	1936 to 1948
Manilla River	Brabri	780	Pressure Recorder	1948 to date
Namoi River	Manilla Weir*	1,200	Staff Gauge	1936 to 1951
Namoi River	Manilla Railway Bridge	2,000	Manometer Servo Pressure Recorder	1952 to date
Namoi River	Keepit	2,200	Float Recorder	1923 to date
Mooki River	Carcona	980	Pressure Recorder	1965 to date
Mooki River	Breeza	1,400	Staff Gauge	1957 to date
Namoi River	Gunnedah	6,600	Float Recorder	1891 to date
Coxs Creek	Tambar Springs	560	Staff Gauge	1965 to date
Coxs Creek	Boggabri	1,560	Staff Gauge	1965 to date
Namoi River	Boggabri	8,700	Pressure Recorder	1936 to date
Namoi River	Below Boggabri Weir Site*	8,750	Float Recorder	1936 to 1951
Maules Creek	Dam Site	66	Float Recorder	1968 to date
Namoi River	Turrawan	9,300	Pressure Recorder	1953 to date

TABLE 7 (cont...)

Stream	Station	Catchment Area (Square Miles)	Type of Gauge	Period of Operation
Namoi River	Karuah*	9,600	Staff Gauge	1936 to 1960
Narrabri Creek	Karuah*	Effluent	Staff Gauge	1936 to 1960
Namoi River	Narrabri	9,700	Staff Gauge	1892 to date
Narrabri Creek	Narrabri	Effluent	Staff Gauge	1911 to date
Namoi River	Mollee	10,900	Staff Gauge	1965 to date
Namoi River	Wee Waa	11,000	Staff Gauge	1954 to date
Namoi River	Womerah	11,100	Staff Gauge	1965 to date
Namoi River	Bugilbone	12,000	Staff Gauge	1951 to date
Baradine Creek	Kenebri*	440	Staff Gauge	1953 to 1960
Namoi River	Goangra	14,000	Float Recorder	1954 to date
Namoi River	Walgett*	16,000	Staff Gauge	1892 to 1931

* - Discontinued Station.

6. CATCHMENT YIELDS

Since the installation of the first stream gauging station in the Namoi Valley in 1891 at Gunnedah, a considerable quantity of data has been obtained relating to the runoff, or water yield, at various points in the valley. The water yield from a natural catchment is dependent on many different factors including annual rainfall, catchment area, topography and geology. In addition other significant factors which affect the volume of runoff resulting from a particular storm are rainfall intensity, vegetal cover and soil moisture conditions.

The yields over the complete years of computed records at existing and discontinued stations for which records have been obtained over a reasonable period are given in Table 8.

TABLE 8.

Stream	Station	Complete Years of Computed Records	Average Yield over Period of Complete Years of Records		
			Acre Feet per Annum	Cusecs	Gallons per Minute
Macdonald River	Woolbrook	41	116,000	159	60,000
Namoi River	North Guerindi	51	226,000	309	115,600
Manilla River	Wimborne *	10	61,000	83	31,000
Manilla River	Brabri	20	170,000	232	87,000
Namoi River	Manilla Weir*	15	236,000	324	121,000
Namoi River	Manilla Railway Bridge	16	379,000	517	193,000
Namoi River	Keepit				
	- Pre dam	36	353,000	483	181,000
	- Post dam	9	257,000	351	131,000
Mooki River	Breeza	11	41,000	56	21,000
Namoi River	Gunnedah	77	563,000	770	288,000
Namoi River	Boggabri	32	771,000	1,056	395,000
Namoi River	Below Boggabri Weir Site*	8	342,000	466	174,000
Namoi River	Turrawan	9	565,000	775	290,000
Namoi River	Karuah*	18	273,000	375	140,000
Narrabri Creek	Karuah*	23	511,000	700	262,000
Namoi River	Narrabri	52	298,000	408	153,000
Narrabri Creek	Narrabri	52	376,000	515	193,000
Namoi River	Wee Waa	10	450,000	616	231,000
Namoi River	Bugilbone	9	523,000	716	268,000
Namoi River	Goangra	14	574,000	786	294,000

* Discontinued stations

At Appendices 12 to 21 inclusive, details are given of the maximum, minimum and mean streamflows for each month of record at the gauging stations on the Macdonald River at Woolbrook; the Manilla River at Brabri; the Namoi River at Manilla Railway Bridge, Keepit, Gunnedah, Boggabri, Narrabri and Goangra; the Mooki River at Breeza and Narrabri Creek at Narrabri.

As indicated in Appendix 15, the average annual flow of the Namoi River at Keepit since the establishment of the station in 1923 has been 334,000 acre feet. However from 1960 the flow at this station has been regulated by Keepit Dam and over this period the average outflow from the Dam has been 257,000 acre feet per annum.

Examination of Table 8 indicates that whilst the average annual flow of the Namoi River at Gunnedah over 77 years has been 563,000 acre feet, the average annual flow of the Namoi River at Narrabri over a period of 52 years has been only 298,000 acre feet. However Narrabri Creek which is an ana branch of the Namoi River carries the greater part of the total flow passing Narrabri and when allowance is made for this factor and corresponding periods of records the estimates are more comparable.

7. AVERAGE ANNUAL RUNOFF

For the purpose of deriving an estimate of the long term average annual runoff from various sub-catchments in the Namoi Valley, streamflow records at the gauging stations in the valley have been correlated with the long period records extending over 77 years for the Namoi River at Gunnedah.

On this basis, the current estimate of the long term average annual runoff from the Namoi Valley excluding the Peel River catchment, is 410,000 acre feet which is equivalent to a continuous flow rate of about 560 cusecs or about 210,000 gallons per minute.

On a square mile of catchment area basis these resources are about one third of the average value for New South Wales and correspond to a percentage runoff of only about 2 percent from the average annual rainfall of 24 inches. In Table 9 a comparison is made between the estimated long term average annual runoff from the Namoi Valley excluding the Peel River catchment with those for the adjacent Peel, Gwydir and Castlereagh Valleys.

TABLE 9.

Valley	Catchment Area in Square Miles	Estimated Long Term Average Annual Runoff		
		Acre Feet	Acre Feet per Square Mile	Percentage Runoff
Namoi Valley (excluding the Peel Valley)	14,800	410,000	28	2%
Peel Valley	1,800	260,000	145	9%
Gwydir Valley	10,000	670,000	67	6%
Castlereagh Valley	6,840	200,000	29	2½%

As indicated by Table 9 the estimated long term average annual runoff from the entire Namoi Valley River system including the Peel Valley is 670,000 acre feet. The previous estimate of 640,000 acre feet for this system as given in the 1963 publication "Review of Australia's Water Resources" was not based on the additional years of records which have since been obtained and additional streamflow data for tributaries below Gunnedah.

8. VARIABILITY OF STREAMFLOWS

The variability of streamflow is a major factor for consideration in the design and operation of water storage schemes.

Whilst average annual flows are suitable for comparison of long term yields from catchments, they do not indicate the surface water resources which could be available in a particular year or the probable extent to which the available resources could be utilised without the construction of water conservation works.

In the Namoi Valley the available records of streamflow indicate a high degree of variability in the annual flow of the various streams. Of the gauging stations having long periods of records, the most marked variation occurs in the Namoi River at Boggabri where the annual flow has varied from about 720 percent to 6 percent of the long term average annual flow. Other large variations occur on the Namoi River at Narrabri and on the Manilla River at Brabri where ranges of from 640 percent to 4 percent and from 650 percent to 10 percent respectively of the average annual flow have been recorded.

Monthly flows exhibit an even greater degree of variability, the greatest variations again occurring at the Boggabri and Brabri gauging stations respectively. At Boggabri monthly flows have varied from a minimum of zero to a maximum of about twenty three times the average monthly flow. Figures 18, 19 and 20, indicate the monthly variations in streamflows at the gauging stations on the Namoi River at Gunnedah, Narrabri and Manilla Railway Bridge and on the Mooki River at Breeza. The Gunnedah and Narrabri flows since 1960 have to some extent been affected by the regulation of flows at Keepit Dam

As may be expected there is extreme variability between maximum and minimum instantaneous flows. The highest recorded flood at Gunnedah occurred in February 1955 when the flow reached an estimated 119,000 cusecs. During the same flood the discharge at Narrabri including Narrabri Creek reached an estimated 111,500 cusecs.

In contrast to these high flows, most streamgauging stations in the valley have recorded periods of zero flow. In 1902, during one of the most severe droughts to be experienced in New South Wales, the Namoi River at Gunnedah ceased flowing for 252 consecutive days.

An indication of the extreme variability of recorded flows at selected gauging stations in the Namoi Valley is given in Table 10. This table shows the maximum , minimum and mean flows which have been recorded at the gauging stations since their establishment.

TABLE 10.

Stream	Station	Years of Computed Records	Recorded Discharge in Cusecs		
			Maximum	Minimum	Mean
Macdonald River	Woolbrook	41	56,000	0	159
Manilla River	Brabri	20	160,000	0	232
Namoi River	Manilla Railway Bridge	16	205,000	0.8	517
Namoi River	Keepit (Pre Dam)	36	169,000	0	483
Namoi River	Keepit (Post Dam)	9	194,000*	0.3	351
Mooki River	Breeza	11	6,040	0	56
Namoi River	Gunnedah	77	119,000	0	770
Namoi River	Boggabri	32	150,000	0	1,056
Namoi River and Narrabri Creek	Narrabri	52	111,500	0	923
Namoi River	Goangra	14	13,400	0	786

* Due to the storage of Keepit Dam the maximum rate of inflow of 233,000 cusecs was reduced to an outflow of 194,000 cusecs.

9. PERSISTENCE OF STREAMFLOWS

Streamflow persistence is best shown graphically by flow duration curves. These curves are constructed so as to indicate the percentage of time over the period of records, that the flow either equalled or exceeded; or alternatively was equal to or less than, a particular value. The flow duration curves and data given in this report indicate the percentages of time flows of various magnitudes were equalled or exceeded.

The flow duration curves for the Manilla River at Brabri, the Macdonald River at Woolbrook and the Mooki River at Breeza are given at Figure 21 whilst the flow duration curve for the Namoi River at Manilla Railway Bridge is given at Figure 22.

The curves at Figures 23 and 24 indicate the recorded flow duration characteristics of the Namoi River at Keepit and Gunnedah respectively under pre Keepit Dam (to 1959) and post Keepit Dam (from 1960) conditions. Due to the different periods and durations of the records for pre and post Keepit Dam conditions, the pre and post Keepit Dam curves should only be regarded as representing factual data and cannot be used for assessing the effect of Keepit Dam on flows downstream at Keepit and Gunnedah.

Summarised details of the flows corresponding to various frequencies of occurrence or exceedance at Brabri, Woolbrook, Breeza, Manilla Railway Bridge, Keepit (pre Keepit Dam) and Gunnedah (pre Keepit Dam) are given in Table 11.

TABLE 11

Stream and Station	Percentage of Time Flow Equalled or Exceeded	Corresponding Flow	
		Cusecs	Gallons per Minute
Manilla River at Brabri	10	370	138,000
	30	85	32,000
	50	25	9,300
	70	9	3,400
	90	1	370
	95	0.5	190
	100	0	0
Macdonald River at Woolbrook	10	300	112,000
	30	95	35,500
	50	40	15,000
	70	20	7,500
	90	5	1,900
	95	2	750
	100	0	0
Mooki River at Breeza	10	98	36,600
	30	16	6,000
	50	4	1,500
	70	2	750
	90	0.5	190
	95	0	0
	100	0	0

TABLE 11 (cont..)

Stream and Station	Percentage of Time Flow Equalled or Exceeded	Corresponding Flow	
		Cusecs	Gallons per Minute
Namoi River at Manilla Railway Bridge.	10	1,010	378,000
	30	295	110,000
	50	150	56,000
	70	65	24,000
	90	15	5,600
	95	7	2,600
	100	0	0
Namoi River at Keepit (pre Keepit Dam)	10	960	359,000
	30	260	97,000
	50	120	45,000
	70	60	22,000
	90	20	7,500
	95	10	3,700
	100	0	0
Namoi River at Gunnedah (pre Keepit Dam)	10	2,040	763,000
	30	680	254,000
	50	280	105,000
	70	110	41,100
	90	15	5,600
	95	5	1,900
	100	0	0

So that the flow persistence characteristics of the various streams may be compared directly, the composite flow duration curve at Figure 25 has been included. The flow duration curves shown on this figure show the flows expressed as cusecs per square mile of catchment area.

Figure 25 indicates that of the stations considered, the Macdonald River at Woolbrook has by far the best low flow persistence. On the Namoi River , Manilla Railway Bridge has a slightly better flow persistence per square mile of catchment area than had the downstream station at Keepit prior to the construction of Keepit Dam. The Manilla River at Brabri whilst being inferior in low flow persistence to the Namoi River stations has a far better persistence than the Mooki River at Breeza which exhibits the least favourable flow persistence characteristics of the five stations considered.

However the flow persistence of streams in the Namoi Valley is less favourable than that of streams in many other areas of the State thereby indicating the value of storage regulation in the Namoi Valley.

10. OCCURRENCE OF FLOODING

The Namoi Valley is not subject to the frequent severe flooding that occurs in the coastal valleys of the State. Since the commencement of streamflow records in 1891, the flow of the Namoi River at Gunnedah has only exceeded 50,000 cusecs on five occasions. In contrast the flow of the Clarence River at Lilydale, where the catchment area is slightly less than at Gunnedah, has exceeded 50,000 cusecs on over sixty occasions during the period of available records commencing in 1922.

An indication of the frequency of minor to major flooding in the Namoi Valley may be obtained from the available long term records of floods at Gunnedah and Narrabri since 1878. These records include available historical reports for floods at Gunnedah and Narrabri prior to the commencement of continuous records at these stations in 1891 and 1892 respectively.

Details of the incidence and magnitude of floods exceeding 23 feet on the gauge at Gunnedah and 22 feet on the gauge at Narrabri since 1878 are given at Figure 26. These heights represent the levels at which minor flooding of land in the vicinity of the two towns commences.

As indicated by the data given at Figure 26 minor flooding is more frequent in the vicinity of Gunnedah than at Narrabri. In the period since 1878, sixty eight floods have exceeded a height of 23 feet on the gauge at Gunnedah whilst thirty five floods have exceeded a height of 22 feet on the gauge at Narrabri.

Floods have occurred in all months of the year at Gunnedah but have been least frequent in the months of April and May. The most common months for flooding to occur have been January, February, March and July.

The highest flood which has been experienced at both Gunnedah and Narrabri since 1878 occurred in February 1955. The estimated peak discharge of this flood at Gunnedah of ~~119,000~~ 327,000 cusecs is about 30,000 cusecs greater than that for the second highest recorded flood of January 1910.

However at several upstream gauging stations the 1955 flood has been exceeded by either the January 1962 or January 1964 floods. Details of the estimated peak flows in the 1955, 1962 and 1964 floods at Gunnedah on the Namoi River and Brabri and Woolbrook on the Manilla River and Macdonald River respectively are given in Table 12.

TABLE 12

Stream	Station	Maximum Flood Flows in Cusecs		
		February 1955	January 1962	January 1964
Macdonald River	Woolbrook	23,400	56,000	10,740
Manilla River	Brabri	93,500	17,200	160,000
Namoi River	Gunnedah	327,000 ~~119,000~~	23,700	116,500 ~~50,800~~

The most recent flood in the valley occurred in January 1968 when a flood volume, totalling about 100,000 acre feet, entered Keepit Dam. However these flows were fully retained in the storage during the flood period thereby mitigating the effects of the flood on downstream development. Nevertheless flood runoff from the remainder of the catchment resulted in a maximum gauge height of 25 feet in the Namoi River at Gunnedah, corresponding to a flow of about 18,600 cusecs.

11. DROUGHT PERIODS

There is no simple, commonly accepted definition of a drought and the criteria used for assessing whether such a condition exists vary widely with geographical location, average rainfall and normal crop requirements.

In general an area is accepted as being under drought conditions when the soil moisture is insufficient for the requirements of the majority of crops during the growing season and when available water supplies are insufficient for domestic, stock and industrial purposes. A diminished or exhausted rate of streamflow is a prime indicator of drought conditions.

Details of the annual rainfalls which have been recorded at Barraba and Gunnedah from 1881 and 1878 respectively, are given at Figure 27 whilst those recorded at Narrabri and Walgett from 1871 and 1879 respectively are given at Figure 28. These figures indicate that the Namoi Valley has experienced extremely low rainfalls in a number of years.

At Barraba, where the average annual rainfall over the past 87 years has been about 26½ inches, the lowest calendar year rainfall occurred in 1957 when only 13.50 inches were received. Other low annual totals were recorded in 1965 (13.79 inches), 1919 (16.33 inches) and 1902 (16.96 inches).

The lowest annual rainfall at Gunnedah over the past 91 years of 9.75 inche in 1946, is 13½ inches less than the annual average of 23.25 inches. It is also considerably less than the next lowest recorded calendar year totals of 13.30 inches in 1925, 13.44 inches in 1965, 13.62 inches in 1923 and 15.52 inches in 1957.

At Narrabri where the average annual rainfall over the past 98 years has been 25.72 inches, 1957 is the driest year which has been recorded. The rainfall received in 1957 of 11.21 inches, is almost three inches less than the next lowest total of 14.16 inches in 1883.

In the extreme west of the valley at Walgett, 1902 was the driest year. The rainfall received at Walgett in that year of 6.74 inches is almost twelve inches less than the average annual rainfall over the period from 1879. Other low annual totals at Walgett were recorded in 1944 (8.19 inches), 1965 (8.26 inches) and 1883 (8.53) inches.

Available streamflow records indicate that all streams in the valley cease flowing for extended periods during severe droughts. At the long term station on the Namoi River at Gunnedah, flow has ceased for a total of 1103 days during the period of records commencing in 1891. The longest continuous period of zero flow at Gunnedah of 252 days occurred from 19th January to 27th September, 1902 .

Table 13 indicates the minimum recorded discharges for periods of 30 days, 6 months and 12 months at selected stream gauging stations in the valley. The overall period of computed records at each of the stations is also shown in the Table.

TABLE 13.

Stream and Station	Period of Computed Records	Minimum Recorded Discharges in Acre Feet		
		30 Consecutive Days	Six Consecutive Months	Twelve Consecutive Months
Macdonald River at Woolbrook	1927 to 1968	0 (Feb.-Mar. 1966)	1,410 (Jan.- June 1966)	7,920 (Aug.1965 - July 1966)
Manilla River at Brabri	1948 to 1968	2.4 (Feb.-Mar. 1966)	500 (Jan.- June 1966)	7,650 (Nov.1960 - Oct. 1961)
Namoi River at Manilla Railway Bridge	1952 to 1968	54 (April - May 1966)	2,230 (Jan.- June 1966)	28,600 (Aug.1965 - July 1966
Namoi River at Keepit	1923 to 1968	119 (Dec.1929 - Jan.1930)	4,760 (Aug.1960 - Jan. 1961)	21,600 (May 1960 - Apr. 1961)
Mooki River at Breeza	1957 to 1968	0 (Dec.1967)	180 (Jan.-June 1966)	845 (Dec.1964 - Nov. 1965)
Namoi River at Gunnedah	1891 to 1968	0 (Feb.1902)	0 (Feb.-July 1902)	10,050 (Dec.1901 - Nov. 1902
Namoi River at Goangra	1954 to 1968	2 (Dec.1967)	8,070 (July - Dec. 1967)	55,700 (June 1965 - May 1966)

12. THE 1964 - 1967 DROUGHT

During the years from 1964 to 1967, the Namoi Valley experienced several periods of extremely low rainfall. Details of the recorded monthly rainfalls at Barraba, Gunnedah, Narrabri, Wee Waa and Walgett since the commencement of below average rainfall in this period, in November 1964, are given in Table 14.

TABLE 14.

Month	Rainfall in Points				
	Barraba	Gunnedah	Narrabri	Wee Waa	Walgett
November 1964	155	30	193	71	147
December 1964	66	94	124	51	75
January 1965	111	62	101	159	9
February 1965	23	120	25	107	78
March 1965	15	16	50	105	27
April 1965	124	50	198	72	15
May 1965	62	12	26	5	1
June 1965	44	43	85	35	50
July 1965	41	28	20	14	48
August 1965	77	136	156	134	94
September 1965	158	209	142	96	80
October 1965	168	212	227	304	115
November 1965	82	64	243	43	60
December 1965	474	392	443	310	249
January 1966	48	12	26	80	67
February 1966	169	84	54	59	18
March 1966	157	146	72	53	149
April 1966	64	46	7	4	50
May 1966	52	36	63	15	58
June 1966	193	201	311	380	170
July 1966	82	38	44	39	52
August 1966	428	350	431	391	461
September 1966	117	139	124	151	96
October 1966	318	207	438	416	105
November 1966	392	488	440	427	220
December 1966	262	227	385	248	149
January 1967	199	31	188	34	55
February 1967	104	54	85	79	99
March 1967	446	535	486	512	401
April 1967	27	33	0	0	0
May 1967	92	207	158	163	159
June 1967	204	197	193	205	233
July 1967	60	35	59	64	50
August 1967	156	155	204	160	122
September 1967	65	42	14	3	2
October 1967	435	355	294	148	26
November 1967	37	7	25	9	25
December 1967	243	98	123	166	94
January 1968	1,292	733	888	657	537
February 1968	248	121	151	134	193
March 1968	221	278	202	193	76
April 1968	51	33	29	49	93
May 1968	297	501	409	424	602
June 1968	21	15	33	16	21
July 1968	177	163	188	151	83
August 1968	408	324	435	318	353
September 1968	219	141	159	118	134
October 1968	178	128	111	82	52
November 1968	142	71	54	62	39
December 1968	516	294	270	387	166

TABLE 14 (cont....)

Month		Rainfall in Points				
		Barraba	Gunnedah	Narrabri	Wee Waa	Walgett
Annual Rainfalls	1964	3,170	2,569	3,797	2,810	1,953
	1965	1,379	1,344	1,716	1,384	826
	1966	2,282	1,974	2,395	2,263	1,595
	1967	2,068	1,749	1,829	1,543	1,266
	1968	3,770	2,802	2,929	2,591	2,349
Minimum Twelve Monthly Rainfall During Period November 1964 - December 1968		971 (Dec.64-Nov.65)	1,012 (Nov.64 - Oct.65)	1,347 (Nov.64 - Oct.65)	1,125 (Dec.64 - Nov.65)	652 (Dec.64 - Nov.65)
Average Annual Rainfall		2,662	2,330	2,575	2,292	1,847

Commencing in November 1964 the Namoi Valley experienced a prolonged period of below average rainfall. With the exception of December 1965 when useful falls occurred many centres in the valley recorded below average monthly rainfalls until August 1966.

As a result of the poor rainfall the whole of the Namoi Valley was a declared drought area from March 1965 to November 1966. During October, November and December 1967 some areas of the valley were again declared as drought areas.

At many locations in the valley, the total rainfall in 1965 approached the lowest calendar year total which has ever been recorded. At Barraba the 1965 total of 13.79 inches was only about ¼ inch less than the lowest recorded annual total at the station since continuous daily measurements were commenced in 1881.

Rainfalls during the first seven months of 1966 were also substantially below average. Notwithstanding reasonably good falls in the remaining months of the year the total rainfall in 1966 was below average in most sections of the valley.

Rainfalls in 1967 were substantially less at most locations than those recorded in 1966. At some locations in the west of the valley, the 1967 total was only slightly more than that for 1965.

However in January 1968 most areas in the valley received their highest rainfalls for over three years. In this month Barraba received almost 13 inches which was only slightly less than the total rainfall recorded in 1965. Following the occurrence of generally satisfactory rainfall over the remaining months of the year the total rainfall recorded at most locations in 1968 was above average.

Due to the low rainfalls, streamflows diminished rapidly during November and December 1964. This trend continued through most of 1965 and by March 1966 most of the headwater streams in the valley had ceased flowing.

The effect of the extended period of low streamflows was reflected in the behaviour of the Keepit Dam storage. This storage which has a capacity of about 345,300 acre feet was reduced from about 340,000 acre feet in November 1964 to only about 16,000 acre feet in June 1966.

Generally satisfactory streamflows occurred from about August to November 1966. However due to low rainfalls in the following three months many streams had again ceased flowing by February 1967.

The situation improved in some streams in March 1967. However due to below average rainfall over the remainder of the year streamflows in the valley remained at comparatively low levels during most of 1967.

The situation was relieved in January 1968 when flooding occurred in most streams in the valley. Throughout the remainder of 1968 flows have been adequate for requirements on most streams.

Details of the minimum twelve monthly flows recorded at selected stream gauging stations in the Namoi Valley in the 1964 to 1967 drought are given in Table 15.

TABLE 15

Stream	Station	Minimum Twelve Monthly Discharge 1964 to 1967		Percentage Mean Annual Flow
		Period	Acre Feet	
Macdonald River	Woolbrook	Aug. 1965 to July 1966	7,920	7
Manilla River	Brabri	Dec. 1964 to Nov. 1965	10,270	9
Namoi River	Manilla Railway Bridge	Aug. 1965 to July 1966	28,600	9
Namoi River	Keepit	July 1966 to June 1967	110,300	34
Mooki River	Breeza	Dec. 1964 to Nov. 1965	845	2
Namoi River	Gunnedah	July 1966 to June 1967	162,400	29
Namoi River	Goangra	June 1965 to May 1966	55,700	11

In the case of Woolbrook, Manilla Railway Bridge, Breeza and Goangra, the minimum twelve monthly discharges during the 1964-1967 drought were the lowest twelve monthly flows ever recorded at the stations. However at the Keepit and Gunnedah stations at which the flows were largely provided by releases from Keepit Dam, the minimum twelve monthly discharges during the 1964-1967 drought were substantially greater than previously recorded minimums for periods of similar durations.

The 1964-1967 drought also provided the lowest recorded discharges over shorter durations at Woolbrook, Brabri, Manilla Railway Bridge, Breeza and Goangra. Details of the minimum recorded discharges over periods of thirty consecutive days and six consecutive calendar months at these stations during the 1964-1967 drought are given in Table 16.

TABLE 16

Stream	Station	Minimum Discharge during the 1964 - 1967 Drought (Acre Feet)	
		30 days	Six Months
Macdonald River	Woolbrook	0 (Feb.- Mar. 1966)	1,410 (Jan.- June 1966)
Manilla River	Brabri	2.4 (Feb.- Mar. 1966)	500 (Jan.- June 1966)
Namoi River	Manilla Railway Bridge	53.6 (Apr.- May 1966)	2,230 (Jan.- June 1966)
Mooki River	Breeza	1.4 (Feb.- Mar. 1967)	178 (Jan.- June 1966)
Namoi River	Goangra	123 (Apr.- May 1966)	8,940 (Feb.- July 1966)

13. WATER REQUIREMENTS FOR CURRENT DEVELOPMENT

In the Namoi Valley, excluding the Peel Valley, the area authorised for irrigation has increased from 3,201 acres in 1944 to 99,087 acres at 30th June 1969. This represents more than a thirty fold increase in a period of 26 years.

Over the same period the number of licenses for irrigation has increased from 101 to 599.

Prior to June 1963 when 13,698 acres were authorised for irrigation, there had been only a gradual increase in the total area under irrigation in the Namoi Valley. However since June 1963 the number of licenses have almost doubled whilst the authorised area has increased more than seven fold.

Details of the variations in the area authorised for irrigation and the corresponding number of licenses over the period from June 1944 to June 1969 are given at Figure 29.

Some of the authorised areas covered by licenses in this recent development have been very large, up to 7,534 acres being covered by a single authority for a Joint Water Supply. Since 1965 no further authorities have been given for joint water supply schemes and a maximum limit of 400 acres has been placed on new licenses.

In addition to the requirements for authorised areas of irrigation, substantial volumes of water are drawn from streams in the valley for to and other types of water supply. At 30th June 1969 there was a total of 51 licensed water supply schemes having a total capacity of about 13,000 gallons per minute (34 cusecs).

The estimated total maximum requirements in the Namoi Valley, including the catchment upstream of Keepit Dam, but excluding the Peel River catchment, under present conditions for irrigation under license, water supply and riparian usage (not including transmission losses) are given in Table 17.

TABLE 17

Requirement	Cusecs	Gallons per Minute
Irrigation under license (99,087 acres at 2.0 feet per 8 months season)	408	152,000
Town, stock and other water supplies	34	13,000
Riparian usage	130	49,000
Totals	572	214,000

As the total requirements given in Table 17 include licensed areas upstream of Keepit Dam and on downstream tributaries of the Namoi River, the requirements of these areas cannot be satisfied from regulated flows from the dam.

In addition the total requirements include irrigation licenses covering about 6,000 acres which restrict diversions to periods of relatively high flow in the Namoi Valley.

Details of the areas authorised for irrigation and the total prese maximum demands for irrigation, water supply and riparian usage (not including transmission losses) on various streams in the valley are giv in Table 18.

TABLE 18

Stream	Area Authorised for Irrigation at 30th June, 1968 (Acres)	Total Present Maximum Demands	
		Cusecs	Gallons per Minute
Namoi River:			
Above Keepit Dam including Macdonald River	2,161	33	12,400
Keepit Dam to Narrabri	9,857	70	26,200
Narrabri to Barwon River	77,002	356	133,100
Manilla River and Tributaries	2,370	35	13,100
Mooki River and Tributaries	1,077	24	9,000
Effluent Streams:			
Narrabri Creek	1,431	24	9,000
Gunidgera Creek System	2,648	15	5,600
Turragulla Creek	400	11	4,100
Miscellaneous Namoi River Tributaries			
Above Keepit Dam including tributaries of Macdonald River	640	7	2,600
Keepit Dam to Narrabri	131	2	800
Narrabri to Barwon River	179	3	1,100
Totals	97,896	580	217,000

The requirements given in Tables 17 and 18 do not include allowance for transmission losses due to evaporation from the stream surface and seepage into the bed and banks of the channels. Such losses may be of substantial magnitudes during drought periods and are directly related to flow levels within the streams and to groundwater conditions. Therefore these losses vary widely depending on antecedent meteorological conditions.

14. POSSIBLE IRRIGATION DEVELOPMENT

The potential for irrigation development within the Namoi Valley has been the subject of investigation along the main river and its effluents (including Gunidgera and Pian Creeks) since the completion of an investigation into bore water supplies in 1950. This indicated that the proposed distribution of surplus regulated flow from Keepit Dam to lands within the Great Artesian Basin was no longer necessary for supplementation of failing bore water supplies because the decline in flow had been largely arrested by a programme of bore reconditioning.

The investigations initiated into the diversion and distribution of domestic and stock supplies from the Namoi River near Boggabri to an area north of the river extending between Narrabri, Walgett and Collarenebri (known as "Narrenbri") and south of the river between Narrabri, Coonamble and Walgett (known as "Narcoongett") were therefore abandoned and consideration given in 1950 to the development of irrigation on lands comprising about 60,000 acres south of the Namoi River between Narrabri and Wee Waa (known as "Narrawaa"). This proposal (which envisaged the diversion of water from the Namoi River near Turrawan) was not implemented because soil surveys undertaken by the C.S.I.R.O. both north and south of the river disclosed the usefulness of the latter soils under irrigation to be restricted to horticulture and the growing of cereals. Soils to the north of the river, however, appeared well suited to irrigation.

The Commission's investigations were therefore extended during the period 1952/55 to include the foregoing lands and those lying between Carroll and Boggabri on both banks of the river.

These investigations revealed within the area bounded by Carroll, Breeza, Gunnedah and Boggabri is an area of approximately 200,000 acres (which could be commanded by diversion from the river near Carroll) a large portion of which comprises superior alluvial soils, well structured and suitable for a wide range of crops and pastures. However, almost 70% of this area is subject to heavy inundation by flood waters from the Namoi and Mooki Rivers and flood protection would be costly.

South of the Namoi River between Boggabri and Turrawan is an area comprising 13,000 acres containing a mixture of dense and solodized soils, the former suitable only for pastures and the latter unsuitable for irrigation. This area is completely submerged during major floods.

North of the river extending northwards from Narrabri for more than 20 miles lies an area of land approximately 10 miles in width comprising about 70,000 acres and containing a high proportion of superior soils, apparently well structured and suitable for a wide range of crops and pastures. This area could be commanded by diversion from the river at Turrawan.

The most attractive soils structurally are the dark coloured low-lying types forming the black soil plains.

Portion of this area is liable to flooding from the Namoi River. Local flooding of limited extent occurs from the spilling of Bobbiwaa Creek, Middle Gully, Galathera Creek and Ten Mile Creek.

North of the river and north to north-west of Wee Waa as far as Reedy Watercourse lies an area of more than 70,000 acres of soils topographically suitable for irrigation containing a high proportion of versatile, well structured dark coloured soils suitable for a wide range of crops and pastures.

With the exception of isolated high ground, a large part of the area is subject to flooding from major floods in the Namoi River and the remainder from flooding in the creek systems originating in the Nandewar Range to the east. Flood protection of this area would be costly.

The apparent suitability of these soils for intense culture as well as for pastures and field crops, together with that of the local climate and the availability of a dependable irrigation supply led to consideration being given to the growing of cotton and to the Government approving the establishment of the agricultural experiment farm eight miles east of Wee Waa in 1958.

The function of the Department of Agriculture's experiment farm was to determine the general agronomics and economics and water requirements of pastures and crops suitable for the region, with particular emphasis on the development of a cotton - pasture rotation.

Intensive irrigated farming of cotton has since become the dominant form of irrigation development in the Namoi Valley.

The major cotton development is situated within the Narrabri-Wee Waa area adjacent to the river and along the Gunidgera-Pian effluent creek system on the heavy, well structured soils.

Whilst the Commission's investigations indicate that approximately 420,000 acres of topographically suitable lands could be commanded from the Namoi River between Carroll and Wee Waa, much of this area lies at a distance of up to 14 miles from the river and, therefore, would be unlikely to be developed under license. The area which could be readily commanded from the Namoi River between Keepit Dam and Wee Waa (lying within 2 miles of the river) has been assessed as approximately 60,000 acres.

Table 19 hereunder indicates the areas lying within 2 miles of the Namoi River and its tributaries which have been assessed as being topographically suitable for irrigation development. The suitability of the soils, however, would require confirmation by a soil survey.

TABLE 19

Stream	Area Assessed as suitable for Irrigation (Acres)
Macdonald and Namoi Rivers above Blue Hole Dam Site	3,500
Namoi River - Blue Hole Dam Site to Keepit Dam	7,900
Namoi River - Keepit Dam to Gunnedah	6,200
Namoi River - Gunnedah to Narrabri	34,000
Namoi River - Narrabri to Wee Waa	19,000
Namoi River - Wee Waa to Bugilbone Gauge	12,000
Namoi River - Bugilbone Gauge to Barwon River	44,000
Manilla River - Above Dam Site	3,400
Manilla River - Below Dam Site	7,500
Mooki River	39,000
Quirindi Creek	7,500
Cox's Creek	13,000
Maules Creek	5,000
Minor tributary streams above Narrabri	28,000
Tributary streams below Narrabri	23,000
Gunidgera-Pian effluent creek system	112,000
Other effluent streams	10,000
Total	375,000

It is evident that the availability of topographically suitable areas will not be a limiting factor in the development of irrigation enterprises, but rather the availability of water. This is equally true for cotton development as investigations have shown that neither the lack of topographically suitable lands or the availability of suitable soil types will limit this development.

In the section of the valley upstream from Gunnedah, the topography is generally suitable for the construction of farm dams. In addition due to the temporal pattern of rainfall over this upstream section of the valley, farm d could provide an economic source of water for supplemental irrigation.

Although there have been relatively few farm dams constructed to date, i

expected that such storages will provide useful water supplies in the future.

In the 1967/68 season approximately 42,000 acres of cotton were grown under irrigation in the Namoi Valley yielding over 100,000 bales. Of this acreage approximately 6,000 acres were irrigated from bore water supplies. The production of cotton in Australia is rapidly approaching spinners' current requirements of approximately 127,000 bales.

As the rate of cotton bounty varies with total domestic production and a dependence on an export market is developed it is expected that grower prices will be reduced. However, irrespective of the cotton price it is considered unlikely that land developed for cotton will revert to earlier livestock and cropping uses. It is probable that the high level of production efficiency achieved and heavy investment in irrigation will be diverted to development of irrigated cash crops and integrated livestock and fodder enterprises. Possible alternative crops are lucerne hay, maize, grain sorghum, sunflower and safflower seed. These crops could be developed in rotation with cotton.

15. INVESTIGATION OF STORAGE PROPOSALS

When the decision was made to provide a regulating storage on the Namoi River the site at Keepit Dam was selected after investigating a number of alternative sites along the upper reaches of the river and its tributaries extending downstream to a point about 7 miles below the town of Boggabri.

Keepit Dam on the Namoi River (completed in 1960) and situated 3 miles upstream of the Peel River confluence has a catchment area of 2,250 square miles and a storage capacity of 345,000 acre feet. It provides an average regulated flow of 184,000 acre feet at Gunnedah during normal years. The location of Keepit Dam is shown on Figure 30.

The Blue Hole Dam Site shown on Figure 30, possessing a catchment area of 900 square miles, is situated on the Namoi River approximately 17 miles upstream of the town of Manilla. This site was the subject of some preliminary investigations between the years 1915 to 1923. Commencing in 1967

comprehensive investigations have been undertaken into the engineering feasibility of constructing a dam at this site, and also an economic analysis of the proposal. Results to date indicate that a storage at this site with a capacity of 275,000 acre feet operated in conjunction with the existing Keepit Dam would increase the average annual regulated flow in the Namoi River at Gunnedah by about 52,000 acre feet.

Investigation of Gins Leap Dam site, see Figure 30, on the Namoi River 7 miles downstream of Boggabri was abandoned some years ago because of the large area of valuable land which would have been submerged including part of the town of Boggabri. The maximum possible depth at this site without submerging a large part of the town is about 44 feet and the available capacity at this depth is only 90,500 acre feet.

Other possible dam sites in the Namoi River are situated at "The Falls" about 19 miles upstream of Blue Hole and at points 8 miles upstream and 1 mile downstream of Blue Hole. In view of the smaller storage capacities of the upstream sites and the longer length of the dam at the downstream site when compared with Blue Hole, these alternative sites do not warrant any immediate further examination.

Several suitable sites for a major storage dam exist on the Manilla River about 18 miles upstream of the town of Manilla. They lie in very close proximity to each other in a gorge 1½ miles long and are served by runoff from a catchment 640 square miles in area. Following preliminary investigation of three of these alternative sites the most upstream site, known as Split Rock, has been subjected to more intense investigation. Results to date indicate that a storage with a capacity of 300,000 acre feet at Split Rock, as an alternative to the Blue Hole Dam and operated in conjunction with the existing Keepit Dam, would increase the regulated flow at Gunnedah by approximately 55,000 acre feet per annum.

No investigations have yet been undertaken of a possible dam site on Iron Bark Creek because of the obvious superiority of the storage proposal on the Manilla River at Split Rock. The location of the

selected dam site on Iron Bark Creek is shown on Figure 30.

Inspection has been made of several dam sites on Quirindi Creek which could provide a domestic, stock and irrigation supply for an area of about 4,000 acres and make possible the implementation of land subdivision and provide an improved water supply to Quirindi. One site, 2 miles upstream of Wallabadah, appears suitable but investigations have not been carried out because preliminary studies indicate that the proposal does not compare favourably with others as yet not implemented.

Three possible dam sites have been selected for closer examination on Maules Creek. At present, irrigation supplies on properties fronting Maules Creek are obtained from bores and wells and expansion of irrigation is limited to these supplies because Maules Creek is frequently dry. Local representations have been made for the construction of a dam on Maules Creek to make possible an increase in irrigation development downstream to its confluence with the Namoi River. In view of the intermittent nature of flows however, and the small catchment areas above the dam sites, it appears that a storage of a depth of 100 to 150 feet would be required to provide an assured regulated flow.

During the construction of Keepit Dam, a number of sites between Carroll and Narrabri were surveyed for weirs to divert water by gravity to possible State sponsored domestic stock and irrigation schemes. Because of the rapid development of private irrigation schemes following the completion of Keepit Dam, further consideration of these sites was abandoned.

Recent investigations have been directed to a study of eleven weir sites between Narrabri and Pilliga where the greatest irrigation expansion has occurred. The purpose of the investigation is to determine the sites for weirs which are best suited to allow re-regulation of river flows, or to improve local supply conditions for irrigation development.

The Government's long-term programme envisages the construction of storages for domestic stock and irrigation purposes at an estimated cost of $40 million on the Namoi and Manilla Rivers. Provision was also made for the construction of storages on tributaries of these streams and for weirs on the Namoi River where the need for such works is shown to be justified and the benefits likely to accrue from their construction indicate the projects to be worthwhile.

16. ACKNOWLEDGEMENTS

The Water Conservation and Irrigation Commission gratefully acknowledges the assistance provided by the Director, Bureau of Meteorology, in supplying the section on climatic features, the Rainfall Statistical Data and the Median Rainfall Maps for inclusion in this report and by the New South Wales Public Works Department and the Forestry Commission for providing the information on town water supply schemes and timber resources respectively.

Appendix 1
Sheet 1

WALGETT RAINFALL STATISTICS
(Points)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1878				NO	RECORDS			3	279	279	349	149	
1879	48	657	228	83	309	146	204	91	125	125	160	67	2243
1880	113	346	163	421	71	0	27	2	229	158	0	131	1661
1881	288	419	351	0	222	56	22	110	113	140	311	73	2105
1882	8	424	24	210	203	298	41	0	0	151	272	379	2010
1883	0	69	0	242	214	0	0	112	36	125	55	0	853
1884	36	11	9	150	87	132	73	22	188	70	103	137	1018
1885	114	196	402	153	102	146	9	10	78	26	130	126	1492
1886	263	0	0	191	310	205	273	540	35	266	354	448	2885
1887	307	426	324	121	44	88	236	494	12	190	216	304	2762
1888	61	441	105	0	132	20	0	9	39	15	0	157	979
1889	107	217	325	372	377	324	260	208	0	320	521	171	3202
1890	412	717	318	66	380	358	174	53	252	284	135	73	3222
1891	770	118	198	222	95	185	84	265	186	101	53	218	2495
1892	166	66	54	40	353	55	56	1	174	324	133	27	1449
1893	90	32	206	97	238	419	41	445	15	136	228	98	2045
1894	318	39	850	320	37	207	23	80	106	92	1	111	2184
1895	683	63	10	20	75	79	49	2	162	99	299	217	1758
1896	132	512	18	118	255	70	135	108	14	15	364	46	1787
1897	469	109	194	0	0	311	377	123	152	283	83	76	2177
1898	208	509	3	0	184	114	2	132	73	57	31	29	1342
1899	334	46	57	332	11	108	164	167	147	5	44	14	1429
1900	332	22	208	21	195	158	145	2	126	12	1	97	1319
1901	64	15	242	210	306	185	113	259	60	77	71	6	1608
1902	33	57	4	8	0	31	6	125	27	102	111	170	674
1903	188	5	129	123	384	64	375	70	422	106	346	224	2436
1904	179	487	123	34	96	45	76	24	51	315	70	230	1730
1905	40	209	177	599	94	84	47	53	10	90	158	32	1593
1906	62	332	257	106	194	127	41	166	751	114	163	90	2403
1907	672	2	252	124	5	127	204	105	30	174	214	230	2139
1908	60	712	153	94	24	80	33	256	61	115	198	366	2152
1909	79	302	75	85	101	243	71	374	46	94	121	176	1767
1910	439	55	253	9	43	170	83	81	60	156	155	155	1659
1911	536	316	4	30	134	21	52	143	57	13	219	276	1801
1912	39	100	180	0	0	350	189	32	56	79	43	138	1206
1913	192	144	240	231	432	387	32	2	28	78	66	304	2136

Appendix 1
Sheet 2

WALGETT RAINFALL STATISTICS
(Points)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1914	73	185	238	65	153	56	76	0	27	130	38	271	1312
1915	24	0	9	69	459	88	84	73	18	125	0	211	1160
1916	107	15	31	427	176	242	417	97	138	312	218	402	2582
1917	302	234	0	0	1	238	153	105	163	88	493	241	2018
1918	284	0	41	42	81	34	113	266	2	96	33	56	1048
1919	205	53	26	69	298	10	54	32	27	33	0	273	1080
1920	96	44	25	30	36	492	699	109	302	51	155	199	2238
1921	288	105	112	487	250	420	401	66	73	115	87	261	2665
1922	165	133	9	18	2	110	188	9	229	93	48	298	1302
1923	46	30	33	2	35	332	91	13	65	75	41	282	1045
1924	63	636	5	71	6	214	131	47	202	73	615	97	2160
1925	235	93	76	0	158	421	72	221	18	48	293	295	1930
1926	499	57	332	190	245	72	42	51	165	48	25	286	2012
1927	298	5	94	100	26	71	4	1	72	192	121	377	1361
1928	80	251	356	144	85	70	182	10	1	63	57	21	1320
1929	122	142	98	175	0	91	9	38	26	100	144	25	970
1930	390	40	105	93	70	353	304	115	22	160	121	158	1931
1931	70	40	749	173	370	394	103	10	40	16	151	551	2667
1932	64	61	133	146	199	80	105	18	148	22	78	34	1088
1933	104	48	57	191	166	40	295	59	203	486	530	76	2255
1934	170	551	0	0	1	111	145	110	144	421	127	285	2065
1935	199	0	0	54	0	105	74	60	306	108	35	86	1027
1936	311	199	624	3	244	58	235	86	56	3	8	173	2000
1937	140	341	233	23	7	138	10	87	39	86	118	8	1230
1938	271	17	8	77	270	94	127	115	67	115	28	25	1214
1939	169	208	382	117	128	122	249	280	54	146	104	34	1993
1940	20	172	63	338	36	0	0	35	121	49	106	140	1080
1941	829	100	278	7	92	194	10	11	22	57	89	10	1699
1942	177	276	203	0	234	165	353	23	74	229	192	341	2267
1943	599	11	0	201	82	113	20	78	78	7	230	2	1421
1944	96	118	0	9	77	51	87	334	24	4	19	0	819
1945	117	90	46	156	294	321	133	146	0	72	29	35	1439
1946	388	34	68	12	33	12	20	0	254	28	102	50	1001
1947	177	789	245	80	176	61	85	249	195	242	262	383	2944
1948	117	480	326	106	419	421	33	57	190	12	135	135	2431
1949	189	402	258	132	93	282	66	19	424	456	293	6	2620

Appendix 1
Sheet 3

WALGETT RAINFALL STATISTICS
(Points)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1950	458	545	135	325	237	374	444	82	74	535	421	0	3630
1951	173	182	169	19	121	280	15	95	111	38	64	67	1334
1952	25	188	198	169	111	166	167	224	2	185	23	86	1544
1953	79	456	29	205	245	8	32	101	41	99	179	18	1492
1954	168	609	0	15	3	113	244	102	47	530	103	115	2049
1955	357	636	44	295	155	110	185	123	83	910	148	99	3145
1956	350	813	449	343	161	285	196	25	105	250	21	202	3200
1957	8	483	54	119	0	136	11	49	0	0	0	167	1027
1958	314	183	111	34	198	201	60	81	165	273	62	52	1734
1959	543	941	374	365	79	113	240	0	79	174	114	44	3066
1960	172	29	109	15	130	38	110	47	38	145	406	150	1389
1961	250	182	270	283	79	7	139	78	2	47	517	434	2288
1962	413	71	517	276	105	27	159	254	224	113	231	426	2816
1963	612	132	430	49	232	197	6	146	164	90	179	184	2421
1964	563	93	62	84	156	40	106	80	316	231	147	75	1953
1965	9	78	27	15	1	50	48	94	80	115	60	249	826
1966	67	18	149	50	58	170	52	461	96	105	220	149	1595
1967	55	99	401	0	159	233	50	122	2	26	25	94	1266
1968	537	193	76	93	602	21	83	353	134	52	39	166	2349

Appendix 2
Sheet 1

BARADINE RAINFALL STATISTICS
(Points)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1882	0	661	20	215	279	316	101	56	20	260	485	243	2656
1883	30	179	30	212	336	65	22	178	83	326	132	13	1606
1884	0	32	42	250	69	257	221	36	342	54	211	126	1640
1885	341	205	250	98	72	394	12	6	49	46	80	110	1663
1886	99	0	0	300	430	257	370	734	35	285	365	513	3388
1887	600	430	222	380	40	180	530	353	31	221	322	413	3722
1888	165	486	30	0	128	5	0	0	91	78	23	147	1153
1889	112	190	388	490	822	234	297	207	38	448	370	342	3938
1890	389	732	407	261	544	432	150	145	263	198	95	210	3826
1891	703	90	522	115	135	289	185	170	140	0	20	50	2419
1892	294	0	152	50	400	272	50	100	300	400	264	283	2565
1893	310	90	50	146	327	266	50	525	16	296	89	84	2249
1894	25	46	1019	496	40	177	76	86	127	148	104	90	2434
1895	515	211	0	63	137	113	0	0	258	0	379	226	1902
1896	0	661	439	177	327	58	226	131	92	116	263	122	2612
1897	405	21	117	0	91	433	629	20	257	125	0	96	2194
1898	289	669	0	0	120	239	11	161	100	265	107	168	2129
1899	444	89	30	260	0	234	628	272	156	158	123	35	2429
1900	311	0	476	127	412	432	139	0	101	0	59	333	2390
1901	0	0	0	0	308	45	43	565	88	0	0	72	1121
1902	97	72	48	100	10	75	2	173	72	149	163	229	1190
1903	106	130	197	520	681	25	286	157	480	117	112	220	3031
1904	254	914	234	29	96	92	186	90	43	267	42	185	2432
1905	37	213	225	784	193	170	217	228	19	178	191	78	2533
1906	170	103	236	62	105	275	25	463	459	162	322	32	2414
1907	350	26	201	131	9	247	140	189	52	38	226	293	1902
1908	55	851	222	45	159	119	117	134	119	236	271	298	2626
1909	156	591	99	150	76	274	106	404	157	111	238	339	2701
1910	1070	0	213	35	81	303	125	71	128	237	145	242	2650
1911	471	294	153	0	105	56	269	169	120	136	252	310	2335
1912	55	0	240	0	0	313	377	122	37	315	35	0	1494
1913	220	220	289	265	405	165	60	20	90	85	65	160	2044
1914	186	228	470	65	199	0	100	0	10	60	105	370	1793
1915	100	43	7	122	325	135	235	134	37	169	0	283	1590
1916	135	178	20	307	90	393	475	96	244	232	305	543	3018
1917	693	213	10	0	10	285	93	147	246	181	270	239	2387

Appendix 2
Sheet 2

BARADINE RAINFALL STATISTICS
(Points)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1918	405	30	33	33	80	42	178	375	26	12	50	0	1264
1919	98	223	91	71	350	22	77	60	0	30	0	398	1420
1920	164	55	16	37	42	791	967	175	235	40	219	418	3159
1921	79	125	133	411	305	460	275	108	72	138	25	362	2493
1922	99	322	0	89	18	147	207	20	12	105	90	267	1376
1923	0	15	65	0	12	434	127	25	155	100	107	466	1506
1924	156	466	0	175	45	125	138	117	453	152	1005	165	2997
1925	177	144	109	0	228	115	140	159	42	35	377	140	1666
1926	105	0	634	215	383	70	78	38	321	28	0	245	2117
1927	224	0	94	155	25	110	0	12	6	271	313	398	1608
1928	270	502	354	57	57	149	205	5	0	72	102	83	1856
1929	97	219	136	291	0	94	87	143	113	118	171	125	1594
1930	322	30	333	56	114	534	251	183	90	434	82	87	2516
1931	127	26	503	293	546	544	59	36	25	14	443	210	2826
1932	148	22	262	184	141	135	181	106	460	180	146	117	2082
1933	206	80	115	106	140	158	343	56	272	384	609	189	2658
1934	191	798	0	44	0	147	329	286	198	625	273	380	3271
1935	208	25	0	113	75	80	143	112	271	184	33	280	1524
1936	282	325	249	15	140	93	354	147	279	21	0	218	2123
1937	242	193	244	20	39	180	129	99	60	123	384	62	1775
1938	357	182	41	170	324	133	232	290	6	151	86	60	2032
1939	274	13	416	300	92	217	37	518	19	138	202	43	2269
1940	53	102	112	557	40	8	5	52	126	55	32	291	1433
1941	844	148	570	0	166	318	27	41	55	151	122	63	2505
1942	101	366	146	0	309	304	414	73	108	114	281	321	2537
1943	691	52	18	209	125	76	69	52	70	118	452	37	1969
1944	31	99	47	25	202	118	138	428	85	36	19	0	1228
1945	310	288	47	325	348	403	116	297	6	103	35	275	2553
1946	516	0	55	26	79	77	10	2	214	41	87	281	1388
1947	22	574	304	47	88	68	182	216	312	427	277	826	3343
1948	299	245	519	74	201	511	45	65	179	43	92	332	2605
1949	79	468	305	138	85	158	81	68	462	368	239	113	2564
1950	321	267	83	676	170	569	327	167	144	739	941	108	4512
1951	158	226	164	57	302	305	133	205	132	12	95	73	1862
1952	39	312	428	160	161	250	214	430	5	144	71	25	2239

BARADINE RAINFALL STATISTICS
(Points)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1953	92	435	137	62	211	3	41	300	58	309	242	28	1918
1954	712	697	155	56	0	215	43	69	113	784	134	153	3131
1955	516	922	0	146	216	193	208	230	204	682	152	159	3628
1956	655	650	242	332	256	362	254	37	98	241	10	246	3383
1957	40	318	96	131	4	145	70	99	0	14	22	283	1222
1958	451	83	197	43	278	247	65	107	260	431	55	227	2444
1959	291	457	528	363	49	65	171	0	108	97	204	181	2514
1960	253	12	190	38	198	59	231	55	146	170	400	256	2008
1961	192	397	839	122	87	27	155	198	17	31	433	396	2894
1962	421	271	227	182	145	13	152	232	238	326	69	338	2614
1963	645	184	147	118	269	213	51	157	149	106	154	239	2432
1964	273	85	130	431	160	76	115	116	364	379	25	52	2206
1965	30	12	12	21	28	73	34	154	222	229	63	351	1229
1966	0	71	203	25	57	199	75	475	99	215	317	275	2011
1967	104	161	454	0	115	163	47	124	14	129	0	10	1321
1968	964	187	72	87	484	36	123	295	176	77	63		

Appendix 3
Sheet 1

WEE WAA RAINFALL STATISTICS
(Points)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1885	171	171	157	62	49	433	23	0	202	13	135	69	1485
1886	349	5	0	260	450	151	329	557	15	223	306	167	2812
1887	578	426	200	77	0	204	268	344	5	351	349	161	2963
1888	31	762	31	0	122	26	0	0	101	65	3	40	1181
1889	149	128	142	428	644	343	253	180	62	221	544	187	3281
1890	414	752	617	132	604	437	104	87	270	335	140	93	3985
1891	496	168	233	205	87	307	150	285	323	61	99	225	2639
1892	191	5	163	157	356	135	268	21	386	392	256	433	2763
1893	208	108	461	268	89	344	163	426	0	196	239	157	2659
1894	230	115	1438	378	148	251	10	130	103	224	28	305	3360
1895	472	168	0	25	113	68	32	19	205	212	243	426	1983
1896	64	573	131	162	172	149	179	82	53	67	369	130	2131
1897	286	0	118	0	12	330	603	64	234	146	0	229	2022
1898	485	480	130	0	157	156	2	61	125	29	60	56	1741
1899	230	57	18	87	48	212	365	376	169	111	153	29	1855
1900	408	70	157	212	267	202	144	0	159	11	47	156	1833
1901	267	15	414	108	281	186	108	326	67	188	217	14	2191
1902	35	24	31	0	2	17	0	420	86	151	63	91	940
1903	119	0	268	115	412	66	411	71	319	196	408	399	2784
1904	145	822	239	38	132	100	106	95	63	493	19	190	2442
1905	155	184	159	646	317	50	108	34	0	187	206	6	2052
1906	191	181	265	93	72	182	58	310	422	221	174	44	2213
1907	885	26	685	111	39	183	120	183	22	79	241	568	3142
1908	144	840	939	227	108	144	58	113	184	127	207	265	3356
1909	177	736	52	242	101	347	113	485	115	139	229	366	3102
1910	983	0	377	44	18	438	177	117	69	274	173	156	2826
1911	649	502	207	52	156	23	143	214	70	93	332	194	2635
1912	175	76	243	0	0	413	333	91	122	173	83	150	1859
1913	216	175	201	326	564	296	45	0	90	121	51	410	2495
1914	46	256	340	199	448	62	116	0	84	123	50	463	2187
1915	133	53	6	261	190	125	192	148	30	178	2	548	1866
1916	128	126	98	75	0	214	434	173	239	244	554	440	2725
1917	508	182	10	33	11	234	92	142	331	226	517	516	2802
1918	249	73	8	144	62	8	167	577	32	73	10	71	1474
1919	172	323	34	83	235	41	58	28	3	171	79	207	1434
1920	243	60	37	64	203	894	520	90	190	178	98	258	2835

Appendix 3
Sheet 2

WEE WAA RAINFALL STATISTICS
(Points)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1921	118	34	300	372	404	659	617	90	93	344	45	803	3879
1922	300	270	13	0	8	192	259	15	386	134	46	647	2270
1923	73	20	72	52	36	297	164	34	164	94	127	354	1487
1924	150	447	18	162	23	135	213	170	275	127	831	84	2635
1925	126	156	88	0	93	57	89	103	10	97	380	314	1513
1926	449	0	416	335	450	97	123	67	233	30	0	502	2702
1927	317	38	105	164	15	206	2	36	20	298	155	391	1747
1928	221	599	422	87	21	255	213	6	0	68	119	55	2066
1929	59	236	43	554	1	163	61	82	69	130	139	112	1649
1930	300	17	273	138	42	300	206	114	52	220	24	24	1710
1931	47	43	865	216	598	496	150	49	37	40	240	449	3230
1932	105	34	214	155	148	118	61	44	318	40	168	39	1444
1933	328	59	13	164	104	138	391	42	175	312	412	129	2267
1934	280	569	0	80	10	130	237	196	190	378	169	244	2483
1935	359	33	8	27	69	86	152	74	307	105	36	179	1435
1936	183	131	184	25	168	84	267	149	162	13	27	161	1554
1937	103	171	283	34	13	142	121	101	75	200	336	111	1690
1938	611	150	0	78	333	144	84	298	52	159	177	19	2105
1939	274	20	573	228	91	145	178	256	4	69	57	53	1948
1940	5	54	415	175	18	104	0	89	123	49	55	235	1322
1941	779	67	410	23	40	145	24	23	27	106	121	30	1795
1942	83	543	211	0	187	174	504	65	44	265	462	560	3098
1943	516	20	0	302	132	126	43	98	99	89	666	62	2153
1944	179	146	99	75	100	82	148	223	47	4	88	13	1204
1945	277	264	39	116	366	366	142	132	43	64	40	80	1929
1946	158	96	81	14	51	38	26	0	273	26	237	266	1266
1947	0	758	211	45	103	56	101	238	142	233	257	409	2553
1948	158	76	431	152	150	331	107	40	181	86	119	113	1944
1949	270	546	214	129	22	123	59	81	428	456	376	58	2762
1950	489	492	135	215	145	460	533	133	155	782	649	0	4188
1951	135	209	148	25	77	256	10	206	89	34	32	7	1228
1952	38	237	202	98	213	203	116	420	13	284	114	48	1986
1953	182	675	38	46	393	0	50	319	53	183	171	0	2110
1954	172	633	0	2	33	138	120	53	84	759	452	181	2627
1955	497	506	0	338	212	144	172	179	104	726	178	105	3161
1956	313	1329	396	85	442	356	324	11	202	327	107	263	4155

Appendix 3
Sheet 3

WEE WAA RAINFALL STATISTICS
(Points)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1957	106	320	53	187	20	199	27	37	8	56	19	209	1241
1958	871	56	332	83	217	245	44	105	141	356	56	345	2851
1959	718	559	342	230	49	73	200	0	98	119	186	263	2837
1960	148	150	169	79	126	73	200	67	76	141	319	110	1658
1961	122	356	442	141	246	41	113	163	9	156	320	723	2832
1962	370	98	428	233	114	21	135	265	84	331	116	195	2390
1963	403	112	577	30	289	118	22	133	164	126	346	448	2768
1964	674	72	287	384	195	90	196	105	389	296	71	51	2810
1965	159	107	105	72	5	35	14	134	96	304	43	310	1384
1966	80	59	53	4	15	380	39	391	151	416	427	248	2269
1967	34	79	512	0	163	205	64	160	3	148	9	166	1543
1968	657	134	193	49	424	16	151	318	118	82	62	387	2591

Appendix 4
Sheet 1

NARRABRI RAINFALL STATISTICS
(Points)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1871	160	226	391	320	319	51	149	105	32	246	178	194	2371
1872	488	38	43	28	62	167	226	103	251	396	317	369	2488
1873	349	185	264	25	12	971	11	364	68	119	391	475	3234
1874	827	410	188	177	44	106	484	72	125	170	168	31	2802
1875	36	167	154	194	330	332	184	38	89	158	187	69	1938
1876	158	0	98	217	394	289	315	130	232	62	183	436	2514
1877	367	47	496	17	248	98	49	80	195	59	43	197	1896
1878	51	1428	200	96	60	165	345	26	319	395	465	114	3664
1879	126	964	170	110	495	5	179	349	394	84	143	451	3470
1880	269	209	295	350	66	6	69	38	243	73	60	174	1852
1881	364	219	222	0	172	39	35	178	244	127	320	5	1925
1882	5	729	64	222	285	182	2	113	0	227	358	86	2273
1883	97	155	44	309	332	15	15	129	46	139	129	6	1416
1884	43	78	94	379	71	237	175	30	432	67	214	141	1961
1885	177	325	64	42	66	314	16	5	287	107	82	175	1660
1886	246	13	19	294	587	198	514	554	96	295	446	244	3506
1887	483	459	115	40	59	237	253	345	96	197	284	311	2879
1888	94	741	39	4	107	18	2	2	115	61	228	53	1464
1889	296	49	113	397	658	320	291	245	94	262	636	237	3598
1890	920	977	741	181	624	585	186	55	266	331	219	76	5161
1891	967	383	55	287	104	221	170	246	287	52	132	138	3042
1892	189	82	215	228	351	215	128	136	417	368	329	570	3178
1893	132	309	523	363	168	404	186	361	121	225	275	66	3133
1894	466	88	2009	392	226	232	37	80	155	177	103	202	4167
1895	600	215	0	75	97	84	27	171	239	162	381	255	2306
1896	52	526	120	174	435	148	176	104	94	106	317	163	2416
1897	228	17	120	0	39	438	651	126	171	161	0	197	2148
1898	697	519	74	0	219	222	0	129	34	21	95	77	2087
1899	137	110	69	186	0	243	386	443	59	146	31	69	1879
1900	185	47	324	121	263	351	243	0	79	10	51	162	1836
1901	168	0	452	117	204	175	173	399	48	118	258	100	2212
1902	116	46	49	77	7	67	10	372	290	235	0	448	1717
1903	183	102	329	129	307	54	297	150	355	263	455	366	2990
1904	165	527	542	0	144	97	190	122	89	592	14	182	2664
1905	148	238	209	854	285	88	133	86	9	241	145	101	2537
1906	163	52	393	114	84	146	72	390	516	236	316	83	2565

Appendix 4
Sheet 2

NARRABRI RAINFALL STATISTICS
(Points)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1907	442	33	675	73	57	203	116	183	24	92	345	659	2902
1908	164	703	804	115	36	184	60	100	204	116	343	191	3020
1909	123	595	63	213	118	477	84	440	108	66	272	397	2956
1910	974	15	357	18	139	475	194	114	63	310	153	133	2945
1911	400	292	341	42	104	27	163	82	59	142	223	221	2096
1912	176	179	213	0	5	459	269	104	37	240	84	72	1838
1913	204	297	215	310	542	329	34	0	129	116	33	316	2525
1914	128	101	906	153	417	71	131	0	10	207	168	887	3179
1915	9	194	29	178	153	143	257	199	65	224	48	745	2244
1916	153	87	70	258	11	220	392	173	199	286	495	477	2821
1917	535	149	7	4	4	254	80	141	409	193	489	319	2584
1918	353	23	7	155	49	0	150	639	33	64	145	45	1663
1919	283	283	50	62	221	119	42	24	2	139	17	348	1590
1920	279	117	28	72	143	876	507	176	214	189	272	323	3196
1921	85	80	357	232	365	885	506	77	99	521	116	1098	4421
1922	156	252	26	64	11	230	306	18	319	142	167	527	2218
1923	52	14	138	3	29	321	188	29	153	83	125	522	1657
1924	110	452	38	277	53	216	353	292	264	122	705	112	2994
1925	170	130	234	0	175	56	134	107	10	83	528	324	1951
1926	144	72	287	310	372	85	136	77	269	39	23	625	2439
1927	194	3	70	121	81	205	7	70	16	237	298	666	1968
1928	105	1297	544	182	66	396	243	0	6	70	127	90	3126
1929	87	511	114	688	11	192	108	149	118	168	174	51	2371
1930	333	22	286	184	45	400	218	96	103	289	198	81	2255
1931	111	21	899	232	490	554	67	72	66	52	229	558	3351
1932	94	39	258	142	176	123	149	59	472	74	203	135	1924
1933	520	65	48	48	143	213	582	74	226	397	629	289	3234
1934	948	651	0	68	10	141	326	170	233	430	246	91	3314
1935	443	113	8	54	89	32	255	94	255	102	58	158	1661
1936	177	185	199	23	192	99	326	171	148	11	41	276	1848
1937	99	204	327	29	12	210	236	98	132	284	469	38	2138
1938	319	197	22	48	552	124	124	324	81	208	169	6	2174
1939	499	14	558	161	82	193	144	224	30	87	31	183	2206
1940	2	67	332	180	32	39	0	91	123	119	113	336	1434
1941	1062	373	494	17	73	310	30	69	38	349	117	40	2972
1942	96	567	719	4	110	214	501	44	49	376	593	691	3864

NARRABRI RAINFALL STATISTICS
(Points)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1943	356	42	19	379	177	224	72	116	200	61	530	23	2199
1944	171	361	38	92	280	37	164	437	42	10	88	62	1782
1945	306	237	36	89	481	333	167	170	40	97	101	133	2190
1946	193	270	39	23	57	35	14	0	339	83	396	287	1736
1947	57	731	286	49	123	56	122	244	139	399	280	466	2952
1948	324	19	552	147	295	302	150	48	202	60	171	507	2777
1949	469	538	95	129	4	205	60	163	446	594	428	121	3252
1950	503	547	57	498	190	546	599	72	175	572	1036	54	4849
1951	255	358	108	28	136	252	50	191	165	43	63	48	1697
1952	119	505	152	148	329	204	206	601	21	414	104	163	2966
1953	160	598	59	62	490	0	66	326	46	156	313	3	2279
1954	200	538	0	3	32	296	67	50	103	810	237	146	2482
1955	825	447	0	246	246	169	129	206	105	669	266	126	3434
1956	234	862	209	210	472	472	164	5	111	354	127	149	3369
1957	156	264	47	116	26	161	62	54	1	49	56	129	1121
1958	187	88	260	36	250	197	61	193	237	265	79	378	2231
1959	469	551	163	269	96	59	164	2	73	163	197	328	2534
1960	236	77	178	124	130	70	212	89	95	136	448	210	2005
1961	75	248	224	144	123	55	196	235	7	218	804	477	2806
1962	872	217	568	201	138	23	145	312	229	290	120	430	3545
1963	579	118	798	78	470	194	40	178	307	91	424	309	3586
1964	828	145	331	335	302	192	361	120	453	413	193	124	3797
1965	101	25	50	198	26	85	20	156	142	227	243	443	1716
1966	26	54	72	7	63	311	44	431	124	438	440	385	2395
1967	188	85	486	0	158	193	59	204	14	294	25	123	1829
1968	888	151	202	29	409	33	188	435	159	111	54	270	2929

Appendix 5
Sheet 1

BOGGABRI RAINFALL STATISTICS
(Points)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1884						NO RECORDS				95	217	43	
1885	235	254	26	18	65	327	26	17	159	72	291	184	1674
1886	69	24	94	180	336	140	311	562	61	293	434	238	2742
1887	323	458	231	38	33	146	190	303	5	370	205	218	2520
1888	47	576	26	20	106	22	8	22	87	164	52	43	1173
1889	112	110	80	262	433	324	161	142	76	278	357	258	2593
1890	316	1078	693	151	415	377	184	117	231	320	331	226	4439
1891	411	128	346	152	58	302	118	250	263	120	186	143	2477
1892	106	119	212	120	229	228	169	32	397	332	227	181	2352
1893	113	218	217	288	123	307	217	414	20	252	125	122	2416
1894	361	0	1099	304	138	145	73	76	83	217	57	319	2872
1895	734	165	0	17	68	52	34	44	214	161	406	475	2370
1896	114	393	144	138	177	82	90	150	79	77	242	219	1905
1897	375	0	89	0	20	361	388	99	166	153	0	202	1853
1898	363	427	70	0	212	203	5	113	123	29	75	155	1775
1899	259	92	48	323	30	178	265	362	228	124	78	42	2029
1900	63	35	290	123	249	366	277	23	160	4	90	245	1925
1901	104	11	260	87	149	183	85	372	18	184	155	77	1685
1902	98	33	118	2	0	32	2	372	109	224	6	319	1315
1903	54	0	381	218	585	41	278	141	348	320	147	336	2849
1904	79	430	496	163	150	100	254	139	104	268	47	141	2371
1905	168	369	250	711	254	72	103	112	2	84	171	179	2475
1906	318	315	210	157	110	122	29	414	490	197	386	99	2847
1907	255	25	444	23	47	294	62	166	33	19	267	673	2308
1908	54	741	871	141	32	134	51	111	233	62	517	500	3447
1909	80	546	25	203	51	394	95	458	124	131	168	363	2638
1910	1192	0	264	4	35	405	133	92	11	212	156	318	2822
1911	250	301	116	36	116	43	127	147	191	37	235	407	2006
1912	60	158	101	3	11	330	235	147	33	301	47	81	1507
1913	78	324	294	283	437	296	30	0	96	191	55	415	2499
1914	70	188	294	130	235	43	120	0	12	147	67	405	1711
1915	117	73	27	171	214	136	224	170	68	179	0	276	1655
1916	122	140	61	297	27	280	323	230	216	202	390	545	2833
1917	541	260	0	47	5	224	77	152	381	208	673	242	2810
1918	247	46	38	53	33	46	132	448	49	56	132	0	1280
1919	140	132	75	29	268	27	51	27	6	167	18	277	1217

Appendix 5
Sheet 2

BOGGABRI RAINFALL STATISTICS
(Points)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1920	132	116	7	110	83	639	411	180	301	222	61	258	2520
1921	132	109	309	324	399	468	341	86	64	535	246	567	3580
1922	86	187	57	64	16	143	260	25	108	273	151	341	1711
1923	148	110	130	0	11	242	132	44	186	134	134	372	1643
1924	361	400	26	193	78	147	246	206	199	80	593	115	2644
1925	247	54	130	0	316	38	122	78	0	74	280	279	1618
1926	180	17	499	281	341	57	99	53	291	24	8	443	2293
1927	144	0	133	223	0	114	43	56	11	157	392	367	1640
1928	108	644	480	133	44	342	298	0	3	71	90	89	2302
1929	99	307	89	297	48	105	63	210	100	113	123	92	1646
1930	288	33	165	152	62	388	145	79	71	281	238	123	2025
1931	73	97	584	159	375	435	108	79	73	31	336	376	2726
1932	163	94	209	99	116	106	126	63	300	238	161	131	1806
1933	289	41	114	39	80	197	533	84	202	532	506	244	2861
1934	302	516	0	41	4	115	302	132	200	413	85	202	2312
1935	388	72	20	11	43	48	177	90	360	182	68	92	1551
1936	324	177	255	35	138	45	345	109	168	25	20	389	2030
1937	191	224	188	28	23	114	155	183	67	167	273	255	1868
1938	166	80	4	108	338	120	86	368	75	238	213	41	1837
1939	255	4	328	244	95	132	69	186	22	99	58	18	1510
1940	40	100	251	188	7	51	0	90	137	121	78	287	1350
1941	768	151	536	3	161	239	51	37	48	234	111	54	2393
1942	21	350	194	0	143	110	595	55	60	238	371	300	2437
1943	291	117	0	198	162	183	65	126	184	167	198	152	1843
1944	116	227	31	68	242	60	162	389	25	3	170	56	1549
1945	263	281	61	186	340	328	198	260	38	83	144	35	2217
1946	137	76	21	62	25	52	11	0	190	15	175	161	925
1947	83	920	251	40	160	40	74	232	162	229	193	451	2835
1948	474	117	150	169	178	240	103	97	216	53	172	430	2399
1949	278	615	80	178	39	161	73	154	679	423	303	104	3087
1950	520	470	31	464	173	534	651	188	155	572	981	26	4765
1951	209	251	226	51	117	246	47	147	177	32	76	36	1615
1952	74	529	180	171	292	186	94	545	38	314	95	254	2772
1953	149	629	53	50	412	6	93	304	145	160	165	9	2175
1954	205	359	9	33	37	202	69	52	92	893	243	89	2283
1955	584	666	0	155	179	147	139	173	243	878	257	209	3630

BOGGABRI RAINFALL STATISTICS
(Points)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1956	383	888	173	510	475	345	205	19	178	346	63	180	3765
1957	64	458	70	136	22	67	138	79	13	12	18	357	1434
1958	407	154	121	69	237	189	66	265	266	295	111	319	2499
1959	489	366	290	251	71	48	159	0	98	194	368	488	2822
1960	194	35	93	80	110	162	262	96	138	164	543	244	2121
1961	87	392	344	106	46	44	187	164	29	317	746	218	2680
1962	641	323	206	272	123	6	108	200	174	427	197	507	3184
1963	421	217	538	134	398	127	56	261	172	124	378	353	3179
1964	691	94	222	272	164	92	183	107	344	376	47	163	2755
1965	133	138	90	118	23	46	51	151	196	222	120	486	1774
1966	6	67	105	18	44	260	27	381	186	295	439	275	2103
1967	219	22	412	4	285	215	38	128	31	177	0	148	1679
1968	623	111	245	14	498	10	152	286	162	102	73	230	2506

Appendix 6
Sheet 1

GUNNEDAH RAINFALL STATISTICS
(Points)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1877	NR	1	424	0	134	103	52	116	144		NO RECORDS		
1878	0	484	135	151	62	121	315	144	310	291	378	237	2628
1879	131	506	552	270	510	108	336	434	376	114	216	570	4123
1880	233	120	191	222	113	57	33	21	342	139	53	290	1814
1881	255	482	178	21	52	97	75	299	279	292	304	1	2335
1882	35	380	34	230	147	255	250	NO RECORDS		312	399	498	
1883	89	340	15	394	307	32	11	162	65	259	191	35	1900
1884	37	129	11	297	88	176	159	75	379	86	309	112	1858
1885	95	199	156	84	114	340	28	24	153	57	143	309	1702
1886	452	17	21	217	319	209	232	545	76	310	391	339	3128
1887	754	497	565	58	20	160	222	496	29	207	116	356	3480
1888	44	587	41	19	152	0	26	31	144	262	54	78	1438
1889	159	152	132	372	569	215	235	161	105	335	525	162	3122
1890	454	663	903	196	442	456	131	212	243	402	208	168	4478
1891							NO RECORDS						
1892	154	74	185	195	289	180	168	123	418	422	323	447	2978
1893	364	382	185	220	225	346	210	399	11	337	270	117	3066
1894	395	43	1447	323	149	152	119	129	95	364	111	397	3724
1895	528	208	0	13	133	71	30	55	259	191	250	474	2212
1896	131	538	383	180	155	143	120	316	12	161	286	175	2600
1897	453	15	95	0	41	276	368	149	189	225	1	345	2157
1898	525	375	200	0	261	259	27	91	189	68	115	157	2267
1899	256	52	41	344	25	190	269	430	140	56	92	53	1948
1900	75	61	283	170	224	384	260	16	134	0	116	239	1962
1901	85	10	181	132	110	163	103	397	57	152	158	128	1676
1902	75	55	210	12	28	60	36	227	105	281	62	333	1484
1903	15	66	313	120	455	19	223	171	384	373	90	315	2544
1904	46	281	270	250	64	76	233	201	76	184	52	285	2018
1905	121	347	166	585	269	130	98	141	2	66	102	153	2180
1906	135	233	196	71	107	69	26	483	469	153	380	68	2390
1907	290	90	306	83	38	213	87	126	34	39	293	428	2027
1908	145	658	701	132	65	194	102	81	209	109	425	400	3221
1909	151	561	60	174	80	325	102	427	190	145	182	212	2609
1910	794	86	223	0	44	312	161	98	46	142	77	187	2170
1911	445	303	82	45	108	44	152	168	117	133	357	226	2180
1912	95	114	101	0	39	294	280	171	25	329	128	142	1718

Appendix 6
Sheet 2

GUNNEDAH RAINFALL STATISTICS
(Points)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1913	196	365	226	245	437	284	45	25	105	303	45	374	2650
1914	108	181	297	121	198	27	113	0	37	140	252	434	1908
1915	142	76	90	181	148	138	251	172	135	172	15	391	1911
1916	163	171	50	222	20	243	279	334	228	230	341	409	2690
1917	732	152	23	5	6	211	45	182	395	246	517	315	2829
1918	428	26	79	78	38	81	110	350	35	23	179	33	1460
1919	133	175	83	56	256	105	58	42	22	112	8	341	1391
1920	116	193	5	128	76	679	524	222	276	84	117	257	2677
1921	21	39	443	348	397	378	341	95	63	301	185	514	3125
1922	112	188	8	69	7	95	319	44	113	274	147	439	1815
1923	60	0	45	30	13	276	143	46	174	102	202	271	1362
1924	194	412	46	127	74	174	146	172	283	140	732	200	2700
1925	170	143	112	0	201	44	74	131	30	53	202	170	1330
1926	289	61	383	237	310	72	126	90	206	27	35	589	2425
1927	109	0	65	189	5	101	2	78	35	165	398	497	1644
1928	142	709	592	207	7	302	250	0	5	97	156	69	2536
1929	109	533	56	234	28	57	76	190	97	84	195	61	1720
1930	299	45	64	142	63	614	143	53	81	344	63	132	2043
1931	114	56	435	254	392	428	79	151	53	36	223	556	2777
1932	40	71	261	95	98	97	84	62	375	332	245	163	1923
1933	488	47	246	23	70	232	426	64	219	456	364	287	2922
1934	525	540	0	53	0	127	294	186	153	522	107	181	2688
1935	193	139	19	59	25	22	178	74	258	263	28	132	1390
1936	183	286	336	135	109	30	277	132	139	27	11	297	1962
1937	285	170	180	36	49	157	165	165	63	150	286	241	1947
1938	191	163	15	133	277	126	144	391	165	216	197	151	2169
1939	248	2	304	224	68	146	46	218	10	144	62	25	1497
1940	228	356	237	187	0	136	3	83	135	58	156	304	1883
1941	705	251	890	0	169	308	23	18	62	245	37	63	2771
1942	31	339	109	0	186	216	524	59	75	252	390	343	2524
1943	268	229	13	185	145	148	80	136	196	174	213	112	1899
1944	85	171	25	168	234	68	172	337	28	3	78	24	1393
1945	367	165	58	249	349	319	145	297	8	109	105	24	2195
1946	211	34	45	52	47	48	16	0	170	16	226	110	975
1947	34	697	110	36	145	49	130	256	209	355	368	621	3010
1948	290	141	204	146	214	296	116	47	201	30	219	267	2171

Appendix 6
Sheet 3

GUNNEDAH RAINFALL STATISTICS
(Points)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1949	315	410	91	222	30	190	66	263	433	398	667	86	3171
1950	392	479	41	593	228	493	570	121	66	462	1020	0	4465
1951	324	135	72	62	121	211	102	150	115	37	88	44	1461
1952	76	468	173	89	209	129	129	487	47	233	100	192	2332
1953	96	457	69	46	327	4	86	318	55	219	225	11	1913
1954	261	433	0	98	7	170	61	75	71	627	301	30	2134
1955	399	945	0	181	162	186	113	189	153	635	272	166	3401
1956	336	998	108	226	492	235	173	25	109	393	64	209	3368
1957	147	338	96	184	21	56	125	107	11	13	27	427	1552
1958	540	167	54	11	207	122	74	133	268	362	204	297	2439
1959	399	459	207	220	94	75	127	0	120	182	203	454	2540
1960	360	22	47	164	127	112	240	107	210	279	500	295	2463
1961	144	276	242	146	61	18	218	170	11	238	741	207	2472
1962	399	304	159	146	118	18	102	200	252	408	105	462	2673
1963	491	87	320	99	432	150	60	202	130	229	337	561	3098
1964	660	50	168	274	233	145	142	141	250	382	30	94	2569
1965	62	120	16	50	12	43	28	136	209	212	64	392	1344
1966	12	84	146	46	36	201	38	350	139	207	488	227	1974
1967	31	54	535	33	207	197	35	155	42	355	7	98	1748
1968	733	121	278	33	501	[illegible]	160	[illegible]	141	[illegible]	[illegible]	[illegible]	2002

Appendix 7
Sheet 1

BARRABA RAINFALL STATISTICS
(Points)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1881	NO RECORDS		160	4	87	70	41	184	276	229	324	16	
1882	352	453	118	160	167	275	126	81	4	443	696	425	3300
1883	218	448	150	226	218	20	13	163	168	384	289	201	2498
1884	141	403	127	175	167	176	217	35	443	94	279	138	2395
1885	269	651	118	25	39	347	70	18	278	89	244	462	2610
1886	188	22	59	329	382	303	310	481	95	292	686	259	3406
1887	514	304	259	153	115	195	190	496	28	194	266	684	3398
1888	210	614	218	0	87	31	18	14	231	192	75	91	1781
1889	207	236	245	277	454	212	143	167	175	282	680	231	3309
1890	685	476	686	176	359	336	214	83	252	585	167	267	4286
1891	642	235	221	99	154	185	180	223	295	152	303	284	2973
1892	227	198	190	253	266	146	207	48	478	575	376	672	3636
1893	173	473	287	341	146	490	218	169	48	355	396	72	3168
1894	449	93	1023	295	158	213	59	112	145	556	229	238	3570
1895	610	129	0	74	63	60	33	101	273	302	519	593	2757
1896	246	297	200	99	106	97	175	174	138	130	371	320	2353
1897	439	96	102	0	11	365	351	105	99	201	0	385	2154
1898	403	377	43	0	102	274	0	117	212	63	86	126	1803
1899	145	83	40	517	28	236	245	213	276	168	167	142	2260
1900	327	207	283	191	157	316	424	35	85	30	107	210	2372
1901	75	74	383	183	305	190	190	267	0	180	99	81	2027
1902	102	57	159	0	0	101	0	290	79	342	127	439	1696
1903	59	43	321	320	382	125	312	204	482	344	347	333	3272
1904	95	227	740	126	213	150	194	57	190	247	133	101	2473
1905	172	253	143	543	178	76	46	101	5	240	145	278	2180
1906	174	220	274	149	87	56	56	226	441	198	299	12	2192
1907	327	86	801	119	103	233	52	205	85	108	308	520	2947
1908	153	674	538	252	0	175	79	131	324	144	432	372	3274
1909	125	573	130	283	115	449	21	305	120	217	403	188	2929
1910	1313	33	347	39	35	339	88	95	12	255	243	181	2980
1911	632	404	53	42	185	60	151	92	205	132	532	96	2584
1912	5	206	305	0	23	298	283	125	82	237	142	78	1784
1913	246	382	207	361	418	258	28	10	225	224	30	220	2609
1914	366	305	484	86	252	59	70	5	27	210	196	367	2427
1915	53	20	37	280	118	143	248	200	231	147	23	369	1869
1916	341	310	78	357	43	258	272	263	142	253	438	550	3305

Appendix 7
Sheet 2

BARRABA RAINFALL STATISTICS
(Points)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1917	397	274	20	38	9	155	64	139	500	184	821	473	3074
1918	475	25	52	232	60	51	134	417	11	86	232	58	1833
1919	353	144	50	71	230	54	37	57	22	108	52	455	1633
1920	363	168	39	182	157	749	466	181	183	129	107	347	3071
1921	42	202	280	244	357	410	385	81	186	458	198	726	3569
1922	56	144	4	128	36	146	314	26	235	270	152	689	2200
1923	180	38	182	0	27	345	163	46	133	95	158	339	1706
1924	350	302	125	230	74	220	334	309	232	146	731	239	3292
1925	132	381	202	0	190	44	150	64	5	102	408	255	1933
1926	133	137	162	193	218	186	119	47	161	25	23	366	1770
1927	396	16	126	242	11	98	7	21	7	230	626	375	2155
1928	173	779	734	308	91	441	279	0	15	93	202	103	3218
1929	143	284	164	361	22	125	56	380	112	305	167	94	2213
1930	153	32	258	173	61	384	249	89	74	491	412	157	2533
1931	99	130	706	285	398	351	144	114	86	42	153	702	3210
1932	149	54	280	185	83	69	103	77	410	262	247	139	2058
1933	528	33	67	104	119	273	565	64	223	467	425	286	3154
1934	552	491	3	177	11	93	339	153	270	468	219	116	2892
1935	443	166	21	213	43	22	232	69	225	151	88	181	1854
1936	114	365	252	73	211	52	324	199	190	24	59	445	2308
1937	270	68	671	30	48	100	137	156	110	158	440	324	2512
1938	344	68	42	81	321	88	102	379	52	208	370	2	2057
1939	537	53	496	167	14	209	156	158	13	265	138	122	2328
1940	111	297	254	111	53	61	4	91	153	112	175	349	1771
1941	571	312	471	14	67	414	48	93	45	265	451	15	2766
1942	127	438	313	0	105	147	491	24	153	425	280	691	3194
1943	547	146	17	132	81	147	91	175	309	83	399	311	2438
1944	262	167	26	56	397	13	273	373	33	20	44	308	1972
1945	500	409	17	196	188	476	216	161	166	62	156	61	2608
1946	454	160	54	110	108	69	16	0	260	48	297	236	1812
1947	335	586	227	90	42	112	154	213	209	346	332	540	3186
1948	313	248	101	135	273	492	188	65	204	116	259	432	2826
1949	479	412	93	158	126	247	93	334	486	529	372	133	3462
1950	533	583	127	159	155	502	675	130	253	489	1008	7	4621
1951	395	198	216	57	148	351	53	210	115	40	85	250	2118
1952	90	545	167	266	290	198	143	470	80	621	49	443	3362

BARRABA RAINFALL STATISTICS
(Points)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1953	137	642	79	31	247	15	73	422	84	136	195	5	2066
1954	251	549	36	17	192	142	81	110	109	645	434	365	2931
1955	431	1681	0	161	214	239	148	116	132	848	293	180	4443
1956	366	1123	337	338	590	326	135	14	125	368	57	140	3919
1957	174	215	171	124	8	77	128	81	13	98	66	195	1350
1958	147	207	149	29	239	184	49	195	256	355	85	365	2260
1959	303	716	352	127	73	43	186	11	208	170	388	527	3104
1960	115	165	87	188	171	90	263	189	114	171	322	86	1961
1961	118	409	279	149	54	21	140	180	28	199	686	393	2656
1962	836	116	225	129	80	15	148	322	155	404	152	472	3054
1963	357	141	601	193	532	131	61	386	92	122	327	553	3496
1964	978	106	503	337	229	64	306	150	359	457	155	66	3710
1965	111	23	15	124	62	44	41	77	158	168	82	474	1379
1966	48	169	157	64	52	193	82	428	117	318	392	262	2282
1967	199	104	446	27	92	204	60	156	65	435	37	243	2068
1968	1292	248	221	51	297	21	177	408	219	178	142	516	3770

Appendix 8
Sheet 1

MT. LINDSAY RAINFALL STATISTICS
(Points)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1886	102	35	131	328	494	431	420	866	140	367	517	316	4147
1887	817	568	250	440	107	343	624	709	55	287	390	852	5442
1888	232	905	222	0	146	39	13	16	178	210	103	129	2193
1889	380	288	167	445	629	644	339	333	82	318	872	384	4881
1890	755	1059	1683	251	675	637	401	181	512	541	173	345	7213
1891	1346	186	530	250	485	478	270	528	542	96	74	376	5161
1892	110	128	232	275	423	307	344	144	577	724	324	608	4196
1893	346	562	427	437	149	455	228	485	87	274	554	0	4004
1894	420	289	1318	462	295	156	129	216	130	567	292	237	4511
1895	782	170	0	186	34	107	69	129	245	159	509	300	2690
1896	281	796	200	253	297	171	213	54	115	129	331	140	2980
1897	393	79	180	0	0	475	670	100	202	222	0	359	2680
1898	290	617	47	0	281	414	0	297	328	160	113	103	2650
1899	193	240	179	341	59	236	316	490	285	272	165	185	2961
1900	237	47	366	133	162	397	518	25	85	60	134	292	2456
1901	133	94	600	276	320	335	235	771	29	244	228	87	3352
1902	107	90	87	0	28	222	11	389	151	360	50	330	1825
1903	133	99	260	156	649	39	284	134	378	337	35	402	2906
1904	279	396	726	107	295	218	421	126	137	527	89	229	3550
1905	434	207	158	800	377	133	208	124	21	277	158	157	3054
1906	348	162	442	46	197	160	147	452	718	262	406	273	3613
1907	622	0	1060	114	82	363	45	422	75	84	434	624	3925
1908	302	1118	847	349	52	249	115		NO	RECORDS			
1909	210	837	71	272	140	603	62	713	81	137	487	230	3843
1910	1435	155	518	52	171	705	283	283	67	330	235	687	4921
1911	709	687	176	133	227	56	143	169	301	210	335	284	3430
1912	128	383	296	14	35	765	548	183	116	302	143	54	2967
1913	453	425	235	435	482	433	79	40	188	237	46	270	3323
1914	467	348	648	99	455	126	168	0	66	263	428	570	3638
1915	135	60	100	204	351	289	353	86	263	180	10	531	2562
1916	252	393	213	514	35	464	594	463	228	396	520	538	4610
1917	441	465	65	28	47	315	201	193	742	212	1128	633	4470
1918	705	131	63	81	107	37	176	791	43	105	123	54	2416
1919	354	206	158	77	341	108	67	147	19	180	33	337	2027
1920	512	120	20	259	55	1638	820	310	320	240	65	450	4809
1921	157	40	395	319	586	826	715	100	205	215	21	1255	4834

Appendix 8
Sheet 2

MT. LINDSAY RAINFALL STATISTICS
(Points)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1922	120	160	145	0	0	376	551	118	362	160	115	878	2985
1923	175	25	191	0	52	522	186	371	235	289	169	410	2625
1924	413	567	120	180	60	210	412	582	247	355	991	310	4447
1925	347	157	196	10	355	62	197	275	25	50	546	190	2410
1926	364	195	456	323	543	162	150	60	428	106	75	433	3295
1927	290	90	330	422	52	295	50	90	25	365	620	493	3122
1928	362	810	492	260	314	725	707	0	8	87	235	52	4052
1929	117	602	89	667	40	164	117	492	26	445	107	51	2917
1930	179	97	323	28	115	683	305	261	42	373	740	22	3168
1931	60	313	1088	590	701	843	239	116	139	123	243	688	5143
1932	177	28	205	218	180	124	161	118	742	320	568	295	3136
1933	946	98	35	272	198	437	1049	171	254	937	929	514	5840
1934	563	1089	0	198	55	340	456	406	242	796	315	343	4803
1935	845	110	16	82	120	210	133	178	346	237	122	141	2540
1936	182	513	448	112	305	168	781	409	288	26	98	555	3885
1937	413	328	752	35	56	233	202	222	229	402	658	139	3669
1938	496	76	38	154	624	466	268	783	107	461	345	51	3869
1939	610	45	645	591	110	407	299	396	16	202	182	280	3783
1940	224	20	223	271	48	75	30	153	309	162	203	902	2620
1941	1232	852	611	17	153	721	45	170	60	450	339	127	4777
1942	175	771	482	20	395	233	NO RECORDS						
1943	943	415	0	328	185	160	198	230	396	186	408	160	3609
1944	690	330	52	103	642	54	302	847	66	68	81	209	3444
1945	519	433	56	259	399	760	469	386	121	146	328	100	3976
1946	519	267	310	324	99	358	71	2	505	126	420	477	3478
1947	161	1483	568	200	162	166	316	568	608	470	502	1179	6383
1948	434	194	486	296	431	768	372	176	271	105	357	372	4262
1949	573	722	300	642	83	246	123	250	700	745	643	100	5127
1950	NO RECORDS						1071	184	380	824	1027	0	
1951	547	368	359	72	205	513	152	416	307	68	151	239	3397
1952	28	919	431	192	492	410	213	654	98	613	71	313	4434
1953	280	845	146	49	568	29	94	683	70	204	273	61	3302
1954	461	992	20	0	140	117	82	172	263	1426	594	308	4575
1955	850	1659	8	328	374	253	382	252	120	1133	352	245	5956
1956	454	1543	747	655	1096	691	481	47	282	580	NO RECORDS		
1957	277	519	215	306	30	282	41	200	0	156	51	54	2131

MT. LINDSAY RAINFALL STATISTICS
(Points)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1958	280	260	240	230	327	458	273	290	293	752	117	562	4082
1959	509	857	524	219	107	89	497	1	216	329	437	429	4214
1960	329	127	184	237	430	178	622	226	201	228	454	158	3374
1961	280	387	518	179	143	69	285	364	42	198	769	370	3604
1962	970	386	397	226	189	14	233	502	164	387	92	647	4207
1963	334	230	896	124	661	326	151	273	205	170	282	773	4425
1964	1149	116	477	573	420	160	407	200	692	557	120	140	5011
1965	86	6	22	175	37	148	53	166	238	256	138	810	2135
1966	61	136	174	32	79	322	94	927	143	340	677	301	3286
1967	131	120	702	8	154	377	110	230	48	408	30	214	2532
1968	946	222	370	117	687	37	431	576	.	139	129	192	

Appendix 9
Sheet 1

MILLERS CREEK RAINFALL STATISTICS
(Points)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1892	NO RECORDS			267	452	177	317	189	648	300	348	355	
1893	295	334	543	240	164	372	283	516	90	369	310	90	3606
1894	199	46	926	409	50	224	199	112	181	368	53	366	3133
1895	570	278	29	18	121	100	94	129	229	197	239	637	2641
1896	143	698	287	194	246	304	184	283	39	152	170	205	2905
1897	370	74	15	50	247	329	477	172	229	238	13	315	2529
1898	584	617	11	17	305	343	150	195	180	118	121	158	2799
1899	342	23	86	307	101	374	180	645	142	199	182	62	2643
1900	206	63	217	158	362	609	303	123	99	36	255	437	2868
1901	180	20	292	231	168	226	75	450	60	272	161	51	2186
1902	170	101	98	13	28	92	53	393	164	505	190	559	2366
1903	24	4	247	457	252	143	181	267	806	230	316	398	3325
1904	159	774	248	194	71	113	638	132	58	424	103	398	3312
1905	17	207	299	366	285	203	140	159	10	150	225	192	2253
1906	20	206	298	153	86	191	80	356	290	210	449	106	2445
1907	431	65	248	157	77	257	67	162	88	60	293	543	2448
1908	337	590	521	174	150	155	120	210	329	240	231	154	3211
1909	84	370	40	312	70	331	79	646	201	153	205	327	2818
1910	1070	127	213	38	144	456	181	70	56	210	46	361	2972
1911	655	364	301	89	139	118	293	245	338	93	371	360	3366
1912	198	300	150	110	104	343	541	146	30	180	47	64	2213
1913	233	381	192	349	665	342	124	50	192	329	79	159	3095
1914	236	222	404	199	85	187	278	0	114	193	429	407	2754
1915	145	90	196	111	295	145	332	160	174	211	21	413	2293
1916	57	538	273	464	93	506	617	345	142	357	560	727	4679
1917	458	175	49	8	61	294	118	201	562	223	590	395	3134
1918	364	165	48	124	93	89	177	681	91	65	93	15	2005
1919	285	446	66	95	246	148	108	81	40	138	46	295	1994
1920	523	279	52	168	19	1076	967	296	180	50	290	787	4687
1921	0	35	566	664	496	485	714	157	99	208	453	608	4485
1922	208	75	24	90	13	76	338	67	127	211	67	676	1972
1923	53	17	59	41	25	603	355	113	336	91	372	388	2453
1924	427	570	308	321	110	69	153	149	245	153	810	124	3439
1925	204	154	148	10	237	171	136	184	45	87	138	214	1728
1926	209	56	802	370	529	182	237	82	281	41	59	738	3586
1927	184	7	72	347	66	35	54	122	34	220	363	231	1735

Appendix 9
Sheet 2

MILLERS CREEK RAINFALL STATISTICS
(Points)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1928	490	489	608	313	111	432	408	15	24	145	131	181	3347
1929	100	365	71	261	45	99	94	225	544	374	268	157	2603
1930	304	61	120	42	71	823	272	79	135	513	101	53	2574
1931	246	75	409	643	493	480	259	151	82	59	362	416	3675
1932	174	156	623	195	67	100	213	141	484	153	197	172	2675
1933	444	51	92	158	179	161	465	41	300	368	485	458	3202
1934	213	522	0	74	20	177	378	373	314	548	205	476	3300
1935	294	169	71	132	43	16	206	114	167	398	45	201	1856
1936	275	393	489	124	149	107	428	254	247	30	3	380	2873
1937	462	143	157	67	83	216	150	226	122	174	235	228	2263
1938	128	247	115	312	188	125	236	255	67	207	519	0	2399
1939	331	20	391	394	26	173	90	287	127	131	205	218	2393
1940	8	8	181	441	14	13	13	112	193	85	251	298	1617
1941	1054	110	257	122	138	386	85	124	103	347	115	25	2866
1942	102	225	257	0	212	363	595	127	158	530	373	194	3136
1943	304	82	30	180	374	145	132	252	259	104	456	235	2553
1944	319	368	71	178	445	67	198	467	80	34	124	74	2426
1945	220	326	175	208	533	663	181	373	4	160	241	279	3363
1946	331	0	46	350	57	241	17	0	124	46	147	179	1538
1947	120	457	107	112	139	103	226	267	409	541	238	672	3391
1948	325	385	454	110	116	458	129	44	202	95	135	519	2972
1949	310	724	409	284	26	355	254	124	529	521	235	147	3918
1950	457	600	30	832	236	851	484	270	116	684	653	25	5238
1951	519	111	131	162	66	494	249	259	207	62	108	97	2465
1952	68	334	173	194	163	374	257	766	61	386	126	261	3163
1953	254	256	114	164	522	23	107	333	97	232	284	112	2498
1954	676	972	15	53	44	128	24	99	142	803	376	255	3587
1955	538	1549	80	287	249	158	131	324	181	770	397	247	4911
1956	438	647	423	248	492	373	397	174	73	270	54	242	3831
1957	189	641	164	286	15	153	189	269	20	27	115	319	2387
1958	322	164	10	54	302	174	51	185	523	470	162	473	2890
1959	199	600	460	236	72	207	177	58	107	479	244	425	3264
1960	152	412	67	159	209	42	344	134	318	459	401	686	3383
1961	184	230	251	181	23	126	212	363	11	187	524	381	2673
1962	509	456	182	256	380	33	268	246	229	453	78	364	3454
1963	715	125	363	142	340	257	143	378	279	131	228	263	3364
1964	271	112	336	539	261	325	212	166	383	316	44	214	3179
1965	124	58	13	141	21	101	168	146	217	283	78	775	2125
1966	46	73	190	1	80	160	119	494	200	508	524	285	2680

STATISTICAL RAINFALL DATA
(Points)

Station	Rainfall Statistic	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
Walgett (Period 86 years)	Minimum	0	0	0	0	0	0	0	0	0	0	0	0	674
	10%	38	11	2	0	2	21	9	2	8	14	16	13	1027
	30%	97	57	44	34	75	71	42	35	38	72	62	68	1392
	50%	175	137	117	95	124	113	86	80	72	101	121	136	1794
	70%	302	315	237	173	203	201	163	115	147	155	179	218	2175
	90%	538	617	376	334	323	363	298	261	236	316	357	369	2837
	Maximum	829	941	850	599	459	492	699	540	751	910	615	551	3630
Baradine (Period 70 years)	Minimum	0	0	0	0	0	0	0	0	0	0	0	0	1121
	10%	39	1	0	0	9	28	25	13	6	15	11	35	1391
	30%	105	74	70	44	79	92	79	66	59	89	70	114	1902
	50%	207	188	146	103	131	148	138	119	110	137	128	219	2302
	70%	311	307	239	173	202	249	212	174	192	183	241	282	2548
	90%	632	660	475	360	346	434	353	367	320	423	398	394	3121
	Maximum	1070	922	839	784	681	791	967	565	480	784	1005	826	4512
Wee Waa (Period 80 years)	Minimum	0	0	0	0	0	0	0	0	0	4	0	0	940
	10%	59	17	6	0	12	41	22	6	9	35	24	24	1434
	30%	148	62	59	55	49	108	85	62	56	95	73	86	1856
	50%	212	150	166	109	113	147	129	99	98	153	154	173	2202
	70%	325	305	280	183	201	228	195	172	173	222	241	266	2763
	90%	608	671	459	334	439	408	388	342	319	355	448	498	3223
	Maximum	983	1329	1438	646	644	894	617	577	428	782	831	803	4188

STATISTICAL RAINFALL DATA
(Points)

Station	Rainfall Statistic	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
Narrabri (Period 94 Years)	Minimum	2	0	0	0	0	0	0	0	0	10	0	3	1121
	10%	66	20	21	4	12	34	16	12	19	56	42	47	1680
	30%	146	84	64	58	66	103	72	76	67	100	123	113	2117
	50%	188	201	167	123	139	196	157	115	120	162	195	183	2485
	70%	351	367	291	198	257	240	215	178	228	244	315	324	2981
	90%	761	677	563	343	477	466	389	368	347	406	492	543	3566
	Maximum	1062	1428	2009	854	658	971	651	639	516	810	1036	1098	5161
Boggabri (Period 80 Years)	Minimum	21	0	0	0	0	6	0	0	0	3	0	0	925
	10%	64	18	10	3	16	41	30	22	12	29	47	42	1507
	30%	112	95	70	48	47	94	75	79	67	120	90	142	1839
	50%	185	171	138	131	116	145	126	129	123	180	169	232	2310
	70%	299	342	251	179	202	240	189	185	189	248	254	319	2642
	90%	517	611	494	296	396	376	322	372	301	409	431	450	3170
	Maximum	1192	1078	1099	711	585	639	651	562	679	893	981	673	4765
Gunnedah (Period 73 Years)	Minimum	15	0	0	0	0	4	2	0	2	0	1	0	975
	10%	66	29	14	2	9	36	32	25	11	28	32	37	1460
	30%	131	78	61	63	51	95	86	84	62	110	103	144	1928
	50%	194	171	110	133	110	148	126	141	117	182	185	226	2195
	70%	334	339	220	187	206	215	173	190	190	278	266	339	2607
	90%	525	539	383	252	340	338	309	375	280	404	414	469	3114
	Maximum	794	998	1447	593	492	679	570	487	469	635	1020	621	4465

STATISTICAL RAINFALL DATA
(Points)

Station	Rainfall Statistic	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
Barraba (Period 81 Years)	Minimum	5	16	0	0	0	13	0	0	0	20	0	2	1350
	10%	96	39	28	3	22	43	22	19	13	62	57	67	1788
	30%	151	139	98	95	71	92	80	81	85	134	152	141	2187
	50%	269	220	171	159	126	176	148	125	153	208	243	259	2608
	70%	395	390	279	218	212	264	217	199	224	303	356	370	3160
	90%	567	608	588	335	377	413	338	378	321	491	529	552	3554
	Maximum	1313	1681	1023	543	590	749	675	496	486	848	1008	726	4621
Mt. Lindsay (Period 75 Years)	Minimum	28	0	0	0	0	14	0	0	0	26	0	0	1825
	10%	125	46	29	6	38	60	48	48	26	92	51	54	2506
	30%	249	130	156	106	107	164	151	152	87	178	122	180	3133
	50%	362	288	232	218	189	295	235	230	201	244	273	308	3638
	70%	513	475	433	280	359	434	357	398	286	361	422	430	4295
	90%	887	876	679	483	601	723	623	693	556	657	649	687	5133
	Maximum	1435	1659	1683	800	701	1638	1049	866	742	1426	1128	1255	7213
Millers Creek (Period 72 Years)	Minimum	0	0	0	0	13	13	13	0	4	27	13	0	1538
	10%	60	21	29	39	25	49	69	61	35	59	49	63	1997
	30%	184	109	72	121	71	141	132	126	96	149	126	181	2464
	50%	250	223	174	179	138	197	193	173	150	210	226	262	2879
	70%	344	381	287	284	246	343	273	267	229	358	311	398	3313
	90%	560	634	503	431	478	502	482	433	401	519	476	661	3784
	Maximum	1070	1549	926	832	665	1076	967	766	806	803	810	787	5238

MINIMUM RAINFALL RECORDED IN CONSECUTIVE PERIODS OF UP TO TWELVE MONTHS COMMENCING IN THE MONTH INDICATED

(Points)

Station	Number of Months	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Walgett	1	0	0	0	0	0	0	0	0	0	0	0	0
	2	24	0	0	0	31	0	5	0	0	0	19	36
	3	33	54	1	39	36	29	41	49	0	23	91	47
	4	102	54	43	45	65	68	60	49	47	140	102	56
	5	102	100	49	77	164	83	60	152	164	189	111	108
	6	133	106	145	197	196	83	199	274	254	236	179	108
	7	139	179	201	215	196	240	327	317	272	256	179	139
	8	264	258	303	215	363	347	375	384	316	256	210	145
	9	291	360	320	372	479	375	384	534	316	287	216	270
	10	393	471	477	479	589	384	534	575	347	293	341	297
	11	504	613	584	696	598	534	621	606	353	418	368	399
	12	674	790	777	812	748	621	719	612	478	445	470	510
Baradine	1	0	0	0	0	0	0	0	0	0	0	0	0
	2	0	0	0	0	48	13	0	5	14	0	10	68
	3	0	0	20	122	53	65	18	70	30	55	107	[illegible]
	4	0	73	134	156	105	110	134	90	88	160	119	106
	5	92	146	168	194	153	170	167	262	186	241	131	127
	6	[illegible]	80	249	308	286	189	459	359	329	289	152	155
	7	[illegible]	249	402	434	318	569	560	493	377	389	180	228
	8	[illegible]	402	504	485	609	713	632	493	477	399	253	262
	9	586	504	581	730	770	788	632	493	487	474	287	616
	10	798	591	829	827	881	795	632	586	562	476	[illegible]	638
	11	878	859	894	970	946	859	793	846	564	649	663	851
	12	1121	894	970	1035	946	901	985	889	737	721	870	930

MINIMUM RAINFALL RECORDED IN CONSECUTIVE PERIODS OF UP TO TWELVE MONTHS COMMENCING IN THE MONTH INDICATED
(Points)

Station	Number of Months	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Narrabri	1	2	0	0	0	0	0	0	0	0	10	0	3
	2	66	30	3	5	49	20	4	6	50	52	100	10
	3	152	109	15	115	71	22	68	76	106	154	178	127
	4	159	164	154	129	106	137	166	140	202	273	256	221
	5	222	234	168	129	244	198	222	289	333	370	350	388
	6	362	256	168	248	305	343	351	380	400	489	593	395
	7	372	438	287	309	409	479	493	470	535	695	653	462
	8	631	573	348	525	538	522	585	664	729	695	698	472
	9	767	780	572	590	725	600	672	858	729	838	730	764
	10	936	836	629	841	813	694	858	858	886	848	865	927
	11	992	965	888	929	1026	1073	858	1101	896	962	1080	1085
	12	1121	1152	974	1048	1109	1080	1101	1172	1002	1167	1199	1141
Boggabri	1	6	0	0	0	0	6	0	0	0	3	0	0
	2	54	84	17	2	32	30	11	3	25	30	76	58
	3	178	89	45	34	34	52	84	74	43	144	116	140
	4	196	109	122	36	88	111	216	122	197	215	216	269
	5	240	185	154	150	224	268	260	253	237	315	397	328
	6	283	187	171	265	293	296	376	352	337	496	475	328
	7	285	247	291	355	349	398	488	523	534	558	483	360
	8	384	437	376	481	504	510	592	670	596	583	515	362
	9	574	452	507	524	616	620	678	856	621	635	517	419
	10	589	627	550	636	726	700	911	881	673	646	563	609
	11	764	788	662	746	806	938	994	933	684	646	753	624
	12	925	871	772	826	1068	1021	1089	944	684	836	768	799

MINIMUM RAINFALL RECORDED IN CONSECUTIVE PERIODS OF UP TO TWELVE MONTHS COMMENCING IN THE MONTH INDICATED

(Points)

Station	Number of Months	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Gunnedah	1	12	0	0	0	0	4	2	0	2	0	1	0
	2	60	45	13	11	47	64	16	5	24	38	87	94
	3	105	75	34	100	83	64	103	102	51	105	131	189
	4	135	88	121	133	111	177	202	158	133	245	281	292
	5	148	226	149	163	221	250	242	327	360	337	322	342
	6	303	242	208	333	297	339	448	436	477	528	372	354
	7	331	242	378	349	360	586	479	600	536	580	384	397
	8	453	412	394	544	633	620	818	781	588	627	427	425
	9	584	428	620	685	667	997	897	885	635	675	455	477
	10	639	654	730	719	1132	1002	927	932	683	691	582	647
	11	865	764	764	1225	1196	1130	1077	980	699	691	752	663
	12	975	798	1258	1314	1296	1206	1125	996	699	861	768	889

MACDONALD RIVER AT WOOLBROOK

LOCATION:	Latitude 30°59' Longitude 151°20'
PERIOD OF ESTABLISHMENT:	October 1927 to date
COMPLETE YEARS OF COMPUTED RECORDS:	41 years
ZERO OF GAUGE:	R.L. 82.56 Assumed Datum (Approximately 3,000 feet above mean sea level)
CATCHMENT AREA:	320 square miles
CONTROL:	Rock and gravel
EQUIPMENT:	Automatic Recorder (Pressure type) installed March 1967 Staff gauge, range 0-30 feet
CURRENT METER OBSERVATIONS:	(a) Number obtained : 238 (b) Maximum observation in cusecs : 6,700 (c) Minimum observation in cusecs : 0
MAXIMUM ESTIMATED DISCHARGE DURING PERIOD OF RECORDS:	56,000 cusecs
MEAN DAILY DISCHARGE FOR 41 YEARS:	159 cusecs
MEAN ANNUAL DISCHARGE FOR 41 YEARS:	116,000 acre feet

MACDONALD RIVER AT WOOLBROOK

Year 1927

Month	Discharge in cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean	
Jan.	..	..	..	..
Feb.	..	..	..	..
Mar.	..	..	..	..
Apr.	..	..	..	..
May	..	..	..	..
June	..	..	..	..
July	..	..	..	..
Aug.	..	..	..	..
Sept.	..	..	..	..
Oct.	..	..	..	..
Nov.	..	..	..	..
Dec.	206	15	90	5,604
Total	..	..	..	..

Year 1928

Month	Discharge in cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean	
Jan.	223	7	110	6,844
Feb.	3540	40	327	18,948
Mar.	940	20	129	8,028
Apr.	560	59	162	9,726
May	72	26	42	2,614
June	8040	26	826	49,554
July	1255	140	577	35,762
Aug.	400	48	158	9,792
Sept.	72	20	41	2,496
Oct.	154	15	39	2,430
Nov.	72	2	19	1,152
Dec.	15	4	6	402
Total	..	..	..	147,748

Year 1929

Jan.	72	1	11	860
Feb.	3490	2	619	34,656
Mar.	425	20	60	3,744
Apr.	1005	20	125	7,530
May	33	20	22	1,398
June	59	20	25	1,522
July	154	20	44	2,730
Aug.	4700	26	323	20,034
Sept.	13900	48	770	46,226
Oct.	168	23	66	4,076
Nov.	400	17	52	3,110
Dec.	17	3	8	468
Total	..	..	..	126,354

Year 1930

Jan.	5	1	2	120
Feb.	4	0.3	1	73
Mar.	150	0.3	19	1,204
Apr.	35	0.5	6	335
May	35	5	14	862
June	8740	9	512	30,702
July	1710	95	294	18,258
Aug.	455	82	145	8,996
Sept.	59	19	38	2,306
Oct.	1030	19	173	10,762
Nov.	141	23	43	2,580
Dec.	59	9	18	1,092
Total	..	..	..	77,290

Year 1931

Jan.	95	9	15	962
Feb.	23	9	12	680
Mar.	240	13	28	1,696
Apr.	1140	13	178	10,700
May.	3350	50	370	22,962
June	3900	159	672	40,294
July	2290	95	612	37,944
Aug.	880	82	185	11,480
Sept.	263	59	97	5,810
Oct.	425	29	72	4,434
Nov.	263	19	69	4,166
Dec.	1950	35	261	16,172
Total	..	..	..	157,300

Year 1932

Jan.	50	19	27	1,696
Feb.	95	13	26	1,486
Mar.	141	13	29	1,806
Apr.	19	9	14	812
May	23	9	22	1,362
June	29	23	24	1,428
July	425	23	106	6,566
Aug.	23	9	17	1,038
Sept.	2250	13	343	20,592
Oct.	141	35	54	3,374
Nov.	35	9	20	1,224
Dec.	23	9	10	642
Total	..	..	..	42,026

Year 1933

Jan.	1950	5	127	7,846
Feb.	124	5	54	3,018
Mar.	9	3	5	318
Apr.	9	3	5	304
May	9	9	9	558
June	367	9	57	3,394
July	1320	59	527	32,696
Aug.	263	109	162	10,060
Sept.	4400	95	864	51,840
Oct.	5310	59	664	41,198
Nov.	425	95	183	11,002
Dec.	1060	82	211	13,094
Total	..	..	..	175,328

Year 1934

Jan.	263	29	72	4,488
Feb.	1030	69	212	11,858
Mar.	141	69	99	6,166
Apr.	69	35	48	2,880
May	35	29	30	1,882
June	197	19	47	2,818
July	9160	109	639	39,606
Aug.	17520	218	1027	63,704
Sept.	6080	177	901	54,032
Oct.	9020	59	735	45,578
Nov.	95	50	60	3,596
Dec.	109	42	62	3,820
Total	..	..	..	240,428

MACDONALD RIVER AT WOOLBROOK

Year 1935					Year 1936				
Month	Discharge in cusecs			Discharge for Month Acre Feet	Month	Discharge in cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean			Max.	Min.	Mean	
Jan.	11160	69	1070	66,350	Jan.	210	8	82	5,076
Feb.	69	15	38	2,144	Feb.	390	69	161	9,326
Mar.	25	11	14	862	Mar.	1840	11	237	14,246
Apr.	11	11	11	660	Apr.	110	24	36	2,156
May	11	8	9	544	May	39	15	25	1,546
June	11	8	8	486	June	110	24	41	2,436
July	90	30	40	2,488	July	990	60	314	19,446
Aug.	229	25	57	3,504	Aug.	7480	39	578	35,826
Sept.	1140	43	344	20,638	Sept.	390	71	164	9,812
Oct.	1100	69	236	14,630	Oct.	96	31	50	3,078
Nov.	69	43	51	3,066	Nov.	31	31	31	1,860
Dec.	79	30	40	2,490	Dec.	640	31	232	14,382
Total	..	..	..	117,862	Total	..	..	..	119,190

Year 1937					Year 1938				
Jan.	570	31	317	19,682	Jan.	29	5	12	756
Feb.	31	8	18	1,032	Feb.	197	13	51	2,836
Mar.	1100	15	190	11,804	Mar.	13	5	7	414
Apr.	95	23	46	3,744	Apr.	810	5	83	4,972
May	23	23	23	1,426	May	575	19	61	3,804
June	425	23	129	7,768	June	69	29	36	2,134
July	263	69	94	5,832	July	197	29	51	3,160
Aug.	3350	69	296	18,372	Aug.	2510	82	347	21,524
Sept.	339	50	132	7,938	Sept.	82	35	42	2,536
Oct.	109	50	86	5,336	Oct.	263	35	50	3,100
Nov.	95	29	62	3,714	Nov.	177	19	84	5,072
Dec.	29	13	22	1,378	Dec.	19	1	7	434
Total	..	..	..	88,026	Total	..	..	..	50,742

Year 1939					Year 1940				
Jan.	35	0.5	6	391	Jan.	50	6	19	1,156
Feb.	42	1	8	466	Feb.	610	0.5	33	1,902
Mar.	141	0.5	27	1,690	Mar.	339	0	18	1,127
Apr.	59	13	29	1,762	Apr.	109	3	21	1,236
May	35	23	28	1,738	May	13	6	9	564
June	69	19	29	1,760	June	9	3	7	426
July	109	35	64	3,986	July	23	3	6	374
Aug.	1320	50	222	13,776	Aug.	9	3	5	302
Sept.	109	29	50	2,978	Sept.	59	3	8	480
Oct.	810	50	159	9,836	Oct.	13	5	8	510
Nov.	515	42	201	12,032	Nov.	9	0.3	4	263
Dec.	82	29	41	2,526	Dec.	141	0.3	12	745
Total	..	..	..	52,941	Total	..	..	..	9,085

Year 1941					Year 1942				
Jan.	2920	1	288	17,828	Jan.	1	0.2	0.4	- 28
Feb.	425	23	84	4,726	Feb.	71	1	25	1,392
Mar.	1140	29	287	17,818	Mar.	226	3	40	2,480
Apr.	95	13	33	1,998	Apr.	17	8	12	702
May	42	13	23	1,422	May	17	3	5	330
June	1100	35	217	13,006	June	28	8	11	686
July	109	29	58	3,566	July	7080	12	502	31,146
Aug.	210	23	45	2,802	Aug.	152	12	47	2,892
Sept.	79	25	33	1,988	Sept.	52	12	33	2,000
Oct.	229	25	59	3,634	Oct.	5000	35	417	25,824
Nov.	292	20	56	3,378	Nov.	420	49	118	7,080
Dec.	20	1	11	674	Dec.	60	15	29	1,812
Total	..	..	..	72,840	Total	..	..	..	76,372

MACDONALD RIVER AT WOOLBROOK

Year 1943					Year 1944				
Month	Discharge in cusecs			Discharge for Month Acre Feet	Month	Discharge in cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean			Max.	Min.	Mean	
Jan.	920	49	176	10,888	Jan.	1030	69	343	21,256
Feb.	140	15	40	2,250	Feb.	1250	29	123	7,156
Mar.	15	4	12	724	Mar.	29	13	17	1,058
Apr.	31	11	16	984	Apr.	35	9	15	888
May	24	11	15	934	May	141	9	26	1,596
June	83	19	30	1,810	June	29	13	19	1,120
July	60	24	32	1,972	July	312	13	67	4,182
Aug.	390	24	113	7,030	Aug.	2690	23	332	20,600
Sept.	1100	60	204	12,262	Sept.	197	42	77	4,594
Oct.	510	49	144	8,900	Oct.	50	13	25	1,570
Nov.	510	31	90	5,206	Nov.	13	9	10	644
Dec.	770	15	157	9,736	Dec.	13	9	9	582
Total	..	..	..	62,696	Total	..	..	..	65,246

Year 1945					Year 1946				
Jan.	141	0	12	737	Jan.	13	4	6	397
Feb.	515	3	47	2,642	Feb.	41	0.8	4	245
Mar.	141	1	24	1,484	Mar.	209	0.2	17	1,070
Apr.	18	3	8	506	Apr.	115	11	26	1,542
May	59	5	25	1,564	May	30	15	20	1,250
June	7760	13	407	24,428	June	51	11	17	992
July	2940	50	236	14,656	July	69	11	22	1,394
Aug.	1255	83	194	12,024	Aug.	8	5	7	460
Sept.	810	27	111	6,658	Sept.	115	3	19	1,126
Oct.	71	17	26	1,602	Oct.	19	9	13	798
Nov.	110	17	24	1,438	Nov.	14	1	5	312
Dec.	34	10	15	930	Dec.	59	0.5	10	587
Total	..	..	..	68,669	Total	..	..	..	10,173

Year 1947					Year 1948				
Jan.	540	0	18	1,100	Jan.	2620	59	385	23,848
Feb.	124	9	18	1,000	Feb.	75	24	46	2,666
Mar.	340	14	57	3,568	Mar.	420	34	75	4,648
Apr.	191	9	38	2,250	Apr.	52	29	33	1,962
May	40	14	26	1,598	May	191	29	53	3,324
June	82	24	40	2,418	June	1290	29	312	18,698
July	111	6	44	2,727	July	480	66	156	9,712
Aug.	340	34	70	4,350	Aug.	6300	40	422	26,164
Sept.	1290	52	209	12,522	Sept.	1800	82	258	15,494
Oct.	950	52	160	9,910	Oct.	111	34	61	3,754
Nov.	420	74	143	8,564	Nov.	420	29	65	3,896
Dec.	1840	66	644	39,912	Dec.	90	14	31	1,942
Total	..	..	..	89,919	Total	..	..	..	116,108

Year 1949					Year 1950				
Jan.	342	14	40	2,464	Jan.	293	24	70	4,336
Feb.	316	9	50	2,800	Feb.	No Records			5,000*
Mar.	111	19	46	2,834	Mar.	No Records			1,700*
Apr.	293	24	56	3,378	Apr.	No Records			6,900*
May	90	29	41	2,544	May	316	34	80	4,932
June	710	40	209	12,530	June	5530	66	1250	74,996
July	9020	52	489	30,312	July	6560	316	1101	68,284
Aug.	4700	59	446	27,676	Aug.	1430	190	580	35,950
Sept.	2040	228	627	37,600	Sept.	777	131	215	12,912
Oct.	1370	140	417	25,882	Oct.	5640	120	1160	71,918
Nov.	2430	66	249	14,934	Nov.	3000	106	603	36,162
Dec.	365	46	129	8,028	Dec.	476	44	136	8,358
Total	..	..	..	170,982	Total	..	..	..	331,448*

* Estimated

MACDONALD RIVER AT WOOLBROOK

Year 1951					Year 1952				
Month	Discharge in cusecs			Discharge for Month Acre Feet	Month	Discharge in cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean			Max.	Min.	Mean	
Jan.	640	44	160	9,942	Jan.	38	6	20	1,246
Feb.	371	60	127	7,112	Feb.	73	0.5	13	802
Mar.	256	30	60	3,728	Mar.	321	18	77	4,752
Apr.	215	37	49	2,930	Apr.	30	16	19	1,146
May	37	37	37	2,294	May	777	16	113	6,976
June	3000	37	576	34,550	June	4600	109	911	54,666
July	2430	158	470	29,110	July	848	109	181	11,246
Aug.	4300	83	715	44,352	Aug.	8460	190	1319	81,780
Sept.	232	83	126	7,534	Sept.	570	120	231	13,870
Oct.	116	46	54	3,360	Oct.	1680	69	410	25,432
Nov.	46	18	32	1,932	Nov.	178	44	70	4,196
Dec.	46	18	25	1,548	Dec.	69	15	25	1,522
Total	..	..	..	148,392	Total	..	..	..	207,634

Year 1953					Year 1954				
Jan.	48	15	22	1,378	Jan.	40	6	26	1,640
Feb.	510	15	85	4,776	Feb.	1000	21	134	7,500
Mar.	170	39	69	4,280	Mar.	90	13	20	1,254
Apr.	78	16	37	2,186	Apr.	13	13	13	780
May	342	39	167	10,360	May	13	11	12	736
June	78	58	66	3,950	June	18	13	14	830
July	1000	48	143	8,838	July	163	13	39	2,404
Aug.	1480	58	287	17,806	Aug.	64	26	35	2,194
Sept.	476	44	107	6,410	Sept.	256	39	65	3,872
Oct.	196	37	69	4,260	Oct.	5000	8	335	20,768
Nov.	215	19	71	4,236	Nov.	1900	37	244	14,626
Dec.	48	0	25	1,576	Dec.	204	14	44	2,748
Total	..	..	..	70,056	Total	..	..	..	59,352

Year 1955					Year 1956				
Jan.	84	14	40	2,510	Jan.	180	6	47	2,912
Feb.	23400	10	2077	116,322	Feb.	15180	51	1558	90,368
Mar.	2325	118	436	27,042	Mar.	1400	104	334	20,696
Apr.	215	45	108	6,492	Apr.	256	48	117	7,000
May	255	39	92	5,710	May	3000	80	602	37,334
June	3520	90	334	20,048	June	2520	190	749	44,950
July	1050	64	268	16,604	July	2240	190	665	41,210
Aug.	1000	90	360	22,292	Aug.	2820	104	432	26,790
Sept.	640	64	197	11,790	Sept.	256	58	113	6,776
Oct.	9020	39	819	50,766	Oct.	1650	58	300	18,588
Nov.	760	39	188	11,274	Nov.	415	13	106	6,376
Dec.	255	31	110	6,824	Dec.	63	13	32	1,988
Total	..	..	..	297,674	Total	..	..	..	304,988

Year 1957					Year 1958				
Jan.	238	18	43	2,690	Jan.	18	0.8	4	233
Feb.	294	11	57	3,184	Feb.	103	9	29	1,623
Mar.	183	13	40	2,458	Mar.	133	2	35	2,167
Apr.	35	9	19	1,160	Apr.	12	0.8	5	297
May	24	18	19	1,188	May	80	7	19	1,163
June	104	13	30	1,786	June	26	7	14	841
July	80	31	44	2,744	July	164	18	46	2,836
Aug.	526	31	104	6,454	Aug.	1100	18	130	8,040
Sept.	145	3	49	2,968	Sept.	880	47	180	10,786
Oct.	16	5	10	646	Oct.	3590	70	365	22,636
Nov.	31	5	8	458	Nov.	129	0.5	42	2,549
Dec.	39	0	5	324	Dec.	468	2	75	4,680
Total	..	..	..	26,060	Total	..	..	..	57,851

MACDONALD RIVER AT WOOLBROOK

Year 1959					Year 1960				
Month	Discharge in cusecs			Discharge for Month Acre Feet	Month	Discharge in cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean			Max.	Min.	Mean	
Jan.	870	64	160	9,940	Jan.	600	17	67	4,140
Feb.	497	59	140	7,844	Feb.	468	17	51	2,940
Mar.	1400	93	189	11,712	Mar.	123	17	46	2,862
Apr.	142	81	107	6,446	Apr.	247	21	43	2,590
May	135	36	68	4,194	May	111	39	58	3,572
June	55	21	26	1,548	June	72	44	49	2,968
July	1050	49	210	13,036	July	1100	49	308	19.096
Aug.	265	49	95	5,916	Aug.	1940	72	357	22,140
Sept.	1050	54	154	9,228	Sept.	720	54	162	9,750
Oct.	600	43	201	12,442	Oct.	247	60	101	6,234
Nov.	3520	48	443	26,596	Nov.	1050	49	134	8,052
Dec.	468	30	151	9,380	Dec.	2640	50	315	19,520
Total	..	..	..	118,282	Total	..	..	..	103,864

Year 1961					Year 1962				
Jan.	325	34	63	3,932	Jan.	56000	59	1410	87,448
Feb.	174	21	49	2,754	Feb.	1110	82	261	14,642
Mar.	41	21	24	1,484	Mar.	113	52	83	5,136
Apr.	41	14	21	1,280	Apr.	4530	35	369	22,166
May	21	14	14	882	May	1060	62	209	12,934
June	210	14	43	2,604	June	248	62	124	7,434
July	228	33	59	3,644	July	4600	35	347	21,504
Aug.	1150	42	183	10,328	Aug.	1650	82	415	25,736
Sept.	155	49	96	5,788	Sept.	200	92	117	7,032
Oct.	840	39	157	9,746	Oct.	4110	35	462	28,656
Nov.	2880	30	406	24,360	Nov.	560	43	117	7,048
Dec.	347	59	157	9,748	Dec.	161	20	62	3,862
Total	..	..	..	76,550	Total	..	..	..	243,598

Year 1963					Year 1964				
Jan.	3800	62	354	21,924	Jan.	10740	21	440	27,300
Feb.	92	13	41	2,272	Feb.	59	17	32	1,840
Mar.	92	20	39	2,430	Mar.	282	24	42	2,620
Apr.	376	20	53	3,150	Apr.	71	7	23	1,360
May	4840	124	939	58,222	May	48	24	34	2,100
June	3000	168	470	28,210	June	147	17	73	4,380
July	1100	155	316	19,622	July	4320	39	594	36,800
Aug.	1760	129	475	29,442	Aug.	3000	47	307	19,050
Sept.	1600	105	359	21,522	Sept.	460	48	93	5,590
Oct.	720	43	212	13,166	Oct.	3120	68	377	23,400
Nov.	369	30	88	5,270	Nov.	1540	33	92	5,530
Dec.	304	21	91	5,660	Dec.	143	1	31	1,930
Total	..	..	..	210,890	Total	..	..	..	131,900

Year 1965					Year 1966				
Jan.	26	0.4	6	368	Jan.	0.5	0	0.2	14
Feb.	14	1	4	254	Feb.	0.5	0	0.1	5
Mar.	1	0.4	0.7	44	Mar.	18	0	2	146
Apr.	9	0.4	5	304	Apr.	2	0	0.2	10
May	4	4	4	248	May	11	2	7	416
June	4	4	4	240	June	35	2	14	818
July	306	4	51	3,170	July	18	4	9	534
Aug.	29	12	18	1,130	Aug.	93	4	22	1,370
Sept.	29	12	24	1,440	Sept.	79	17	32	1,920
Oct.	12	5	10	646	Oct.	200	20	58	3,620
Nov.	5	0.5	3	166	Nov.	3920	20	333	20,000
Dec.	185	0.5	42	2,590	Dec.	122	3	35	2,170
Total	..	..	..	10,600	Total	..	..	..	31,023

Appendix 12
Sheet 7

MACDONALD RIVER AT WOOLBROOK

Year 1967					Year 1968				
Month	Discharge in cusecs			Discharge for Month Acre Feet	Month	Discharge in cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean			Max.	Min.	Mean	
Jan.	207	2	57	3,510	Jan.	3590	4	369	22,800
Feb.	30	0	9	515	Feb.	266	14	47	2,710
Mar.	1600	14	168	10,400	Mar.	48	14	22	1,340
Apr.	144	21	62	3,710	Apr.	14	1	7.1	426
May	56	12	36	2,240	May	266	1	48	3,000
June	1380	25	222	13,300	June	103	9	32	1,940
July	430	55	116	7,190	July	680	20	98	6,100
Aug.	520	55	147	9,090	Aug.	4390	33	895	55,500
Sept.	1760	50	185	11,100	Sept.	2820	58	358	21,500
Oct.	3730	41	254	15,800	Oct.	1600	23	126	7,830
Nov.	117	4	38	2,280	Nov.	460	4	62	3,730
Dec.	39	1	15	906	Dec.	40	1	18.5	1,150
Total	..	..	..	80,041	Total	..	..	..	128,026

MANILLA RIVER AT BRABRI

LOCATION:	Latitude 30°42' Longitude 150°42'
PERIOD OF ESTABLISHMENT:	September 1948 to date
COMPLETE YEARS OF COMPUTED RECORDS:	20 years
ZERO OF GAUGE:	R.L.74.02 Assumed Datum (Approximately 1,150 feet above mean sea level)
CATCHMENT AREA:	780 square miles
CONTROL:	Rock
EQUIPMENT:	Automatic Recorder (Pressure Type) installed October 1952. Staff gauge, range 0-25 feet
CURRENT METER OBSERVATIONS:	(a) Number obtained : 175 (b) Maximum observation in cusecs : 7,200 (c) Minimum observation in cusecs : 0.1
MAXIMUM ESTIMATED DISCHARGE DURING PERIOD OF RECORDS:	160,000 cusecs
MEAN DAILY DISCHARGE FOR 20 YEARS:	232 cusecs
MEAN ANNUAL DISCHARGE FOR 20 YEARS:	170,000 acre feet.

MANILLA RIVER AT BRABRI

Year 1948

Month	Discharge in cusecs Max.	Min.	Mean	Discharge for Month Acre Feet
Jan.	..	..	..	..
Feb.	..	..	..	..
Mar.	..	..	..	..
Apr.	..	..	..	..
May	..	..	..	..
June	..	..	..	..
July	..	..	..	..
Aug.	..	..	..	..
Sept.	82	13	26	1,570
Oct.	28	3	11	688
Nov.	1590	2	48	2,890
Dec.	54	0	8	489
Total	..	..	..	..

Year 1949

Month	Discharge in cusecs Max.	Min.	Mean	Discharge for Month Acre Feet
Jan.	5780	0	168	10,434
Feb.	2340	0.7	186	10,444
Mar.	82	4	21	1,283
Apr.	54	0	9	525
May	149	2	13	829
June	54	4	19	1,160
July	211	7	29	1,806
Aug.	9060	7	359	22,286
Sept.	18000	126	1376	82,544
Oct.	No Records			68,836
Nov.	9060	62	408	24,460
Dec.	350	48	125	7,768
Total	..	..	..	232,375

Year 1950

Month	Max.	Min.	Mean	Acre Feet
Jan.	843	25	127	7,896
Feb.	3500	21	274	15,330
Mar.	126	13	53	3,314
Apr.	843	25	111	6,660
May	126	25	56	3,468
June	4500	48	925	55,498
July	No Records			183,396*
Aug.	No Records			55,294*
Sept.	No Records			37,000*
Oct.	7800	169	1963	121,688
Nov.	36000	257	3532	211,934
Dec.	1590	60	469	29,104
Total	..	..	..	730,582*

Year 1951

Month	Max.	Min.	Mean	Acre Feet
Jan.	424	139	237	14,724
Feb.	661	74	197	11,026
Mar.	350	74	114	7,038
Apr.	60	40	51	3,058
May	60	49	55	3,390
June	424	49	141	8,446
July	207	40	68	4,192
Aug.	661	40	108	6,716
Sept.	91	49	67	4,002
Oct.	49	11	24	1,496
Nov.	11	7	9	528
Dec.	7	5	6	342
Total	..	..	..	64,958

Year 1952

Month	Max.	Min.	Mean	Acre Feet
Jan.	11	4	6	357
Feb.	843	4	83	4,814
Mar.	502	113	241	14,962
Apr.	250	9	72	4,332
May	941	6	786	4,875
June	2500	60	365	21,892
July	843	60	166	10,296
Aug.	11300	74	1622	100,592
Sept.	No Records			13,090*
Oct.	No Records			68,906*
Nov.	No Records			4,444*
Dec.	No Records			2,844*
Total	..	..	..	251,404*

Year 1953

Month	Max.	Min.	Mean	Acre Feet
Jan.	No Records			2,804*
Feb.	941	5	127	7,086
Mar.	139	11	39	2,394
Apr.	11	11	11	660
May	250	19	42	2,616
June	19	16	18	1,098
July	19	18	19	1,158
Aug.	843	18	66	4,061
Sept.	171	19	36	2,146
Oct.	33	8	14	874
Nov.	33	4	9	533
Dec.	8	1	3	169
Total	..	..	..	25,599*

Year 1954

Month	Max.	Min.	Mean	Acre Feet
Jan.	207	1	11	664
Feb.	3660	0.8	109	6,106
Mar.	113	1	8	523
Apr.	33	2	4	220
May	8	1	4	225
June	23	3	8	492
July	6	5	5	299
Aug.	6	3	4	265
Sept.	49	2	6	363
Oct.	4160	2	215	13,318
Nov.	11000	19	607	36,434
Dec.	No Records			3,188*
Total	..	..	..	62,097*

Year 1955

Month	Max.	Min.	Mean	Acre Feet
Jan.	No Records			1,764*
Feb.	93500	No Records		184,806*
Mar.	No Records			18,500*
Apr.	No Records			7,168*
May	No Records			9,466*
June	502	49	74	4,422
July	747	71	133	8,224
Aug.	126	82	108	6,712
Sept.	600	42	107	6,402
Oct.	22700	No Records		142,544*
Nov.	No Records			21,920*
Dec.	No Records			6,848*
Total	..	..	..	418,776*

* Estimated

MANILLA RIVER AT BRABRI

Year 1956					Year 1957				
Month	Discharge in cusecs			Discharge for Month Acre Feet	Month	Discharge in cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean			Max.	Min.	Mean	
Jan.	No Records			5,800*	Jan.	75	11	25	1,548
Feb.	No Records			182,000*	Feb.	60	25	39	2,210
Mar.	No Records			106,000*	Mar.	211	29	38	2,346
Apr.	No Records			44,000*	Apr.	48	21	29	1,738
May	No Records			173,000*	May	29	23	25	1,542
June	No Records			76,000*	June	34	21	25	1,516
July	No Records			56,000*	July	45	25	28	1,760
Aug.	541	185	250	15,484	Aug.	60	18	27	1,690
Sept.	185	149	166	9,968	Sept.	52	11	18	1,072
Oct.	2040	137	192	11,918	Oct.	81	5	10	653
Nov.	387	58	137	8,204	Nov.	45	4	11	651
Dec.	58	18	40	2,500	Dec.	149	4	14	846
Total	..	..	..	690,874*	Total	..	..	..	17,572

Year 1958					Year 1959				
Jan.	3830	2	95	5,905	Jan.	177	5	36	2,253
Feb.	84	7	23	1,316	Feb.	5410	4	260	14,571
Mar.	8	3	6	371	Mar.	1300	15	82	5,084
Apr.	4	2	3	178	Apr.	250	18	52	3,148
May	23	2	8	506	May	20	13	16	988
June	21	5	7	399	June	15	12	13	784
July	94	7	16	1,020	July	843	12	43	2,658
Aug.	19	7	12	728	Aug.	40	7	16	1,002
Sept.	941	9	78	4,680	Sept.	23	7	13	765
Oct.	8620	29	302	18,720	Oct.	40	4	14	895
Nov.	24	4	15	898	Nov.	70	6	28	1,680
Dec.	5600	4	78	4,892	Dec.	1740	3	120	7,452
Total	..	..	..	39,613	Total	..	..	..	41,280

Year 1960					Year 1961				
Jan.	149	5	16	1,010	Jan.	5	0.6	2	102
Feb.	24	1	6	317	Feb.	112	0	9	502
Mar.	4	0.4	3	170	Mar.	34	0.2	5	332
Apr.	2	2	2	130	Apr.	17	0.4	4	258
May	34	2	7	453	May	7	1	3	174
June	10	2	4	239	June	1	1	1	66
July	296	5	76	4,700	July	22	0.6	4	250
Aug.	2830	20	170	10,566	Aug.	48	4	16	996
Sept.	46	12	17	1,038	Sept.	12	1	5	280
Oct.	24	5	10	610	Oct.	0.8	0.3	0.6	40
Nov.	1890	0.4	64	3,852	Nov.	7800	0.3	622	37,300
Dec.	126	3	13	800	Dec.	502	29	97	6,050
Total	..	..	..	23,885	Total	..	..	..	46,350

Year 1962					Year 1963				
Jan.	17200	9	1392	86,300	Jan.	4500	7	146	9,100
Feb.	211	24	90	5,040	Feb.	80	2	17	961
Mar.	46	10	19	1,190	Mar	8000	0.2	152	9,400
Apr.	149	10	30	1,820	Apr.	177	12	48	2,900
May	14	7	9	566	May	7430	20	820	50,900
June	14	7	10	603	June	5410	100	399	23,950
July	17	3	9	525	July	112	70	89	5,500
Aug.	1440	6	106	6,590	Aug.	1590	62	170	10,500
Sept.	24	14	20	1,220	Sept.	502	70	143	8,560
Oct.	4160	4	90	5,590	Oct.	661	62	92	5,720
Nov	46	8	20	1,210	Nov.	296	46	87	5,220
Dec.	126	3	19	1,150	Dec.	2340	54	246	15,200
Total	..	..	..	111,804	Total	..	..	..	147,911

* Estimated

MANILLA RIVER AT BRABRI

Year 1964					Year 1965				
Month	Discharge in cusecs			Discharge for Month Acre Feet	Month	Discharge in cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean			Max.	Min.	Mean	
Jan.	160000	No Records		195,000*	Jan.	66	18	27	1,700
Feb.	No Records			12,000*	Feb.	66	11	17	952
Mar.	265	66	113	7,040	Mar.	66	6	12	734
Apr.	2560	53	187	11,300	Apr.	27	6	14	822
May	135	53	99	6,150	May	18	14	14	892
June	310	82	109	6,560	June	14	9	12	734
July	5780	98	475	29,500	July	11	10	11	658
Aug.	200	82	117	7,230	Aug.	11	9	10	639
Sept.	15300	53	338	20,300	Sept.	10	5	7	440
Oct.	2560	53	221	13,700	Oct.	4	2	4	225
Nov.	480	66	112	6,710	Nov.	3	0.2	1	60
Dec.	66	27	39	2,400	Dec.	5230	0.2	162	10,000
Total	..	..	..	317,890 *	Total	..	..	..	17,856

Year 1966					Year 1967				
Jan.	2	0.3	1	59	Jan.	23	0.5	5	312
Feb.	2	0.1	0.6	34	Feb.	0.7	0.3	0.4	23
Mar.	8	0	0.9	55	Mar.	5780	0.3	80	4,960
Apr.	2	0.1	0.5	31	Apr.	2	0	0.4	26
May	0.5	0.1	0.3	17	May	0.5	0	0.2	13
June	6	0.2	5	304	June	90	0.7	18	1,090
July	6	3	4	272	July	32	5	12	760
Aug.	No Records			1,500*	Aug.	13	5	10	626
Sept.	No Records			5,000*	Sept.	8.5	1	4	240
Oct.	310	8	38	2,330	Oct.	620	0.2	47	2,890
Nov.	10200	13	284	17,100	Nov.	8.5	0.1	1.7	100
Dec.	420	4	21	1,320	Dec.	0.3	[illegible]	0.1	7
Total	..	..	..	28,022 *	Total	..	..	..	11,047

Year 1968				
Jan.	40000	7	1170	72,600
Feb.	83	12	19.8	1,150
Mar.	25	12	18.9	1,170
Apr.	12.5	4.3	7.4	446
May	1280	4.3	43	2,650
June	15.5	6.5	12	720
July	2200	6.5	77	4,760
Aug.	5960	8.5	240	14,900
Sept.	1160	41	221	13,200
Oct.	200	15.5	34	2,130
Nov.	41	2.5	14.5	868
Dec.	24	2.0	9.0	560
Total	..	..	..	115,154

* Estimated

NAMOI RIVER AT MANILLA RAILWAY BRIDGE

LOCATION:	Latitude 30°45' Longitude 150°43'
PERIOD OF ESTABLISHMENT:	November 1952 to date
COMPLETE YEARS OF COMPUTED RECORDS:	16 years
ZERO OF GAUGE:	R.L.1109.44 North West Water Conservation Datum
CATCHMENT AREA:	2,000 square miles
CONTROL:	Gravel
EQUIPMENT:	Automatic Recorder (Pressure Type) installed November 1952. Removed February 1955 Automatic Recorder (Float Type) installed February 1955 Remote Indicator installed April 1964 Telemetering device installed April 1956 Automatic Recorder (Manometer Servo) installed June 1966 Staff gauge, range 0-42.5 feet
CURRENT METER OBSERVATIONS:	(a) Number obtained : 235 (b) Maximum observation in cusecs : 74,400 (c) Minimum observation in cusecs : 0.6
MAXIMUM ESTIMATED DISCHARGE DURING PERIOD OF RECORDS:	205,000 cusecs
MEAN DAILY DISCHARGE FOR 16 YEARS:	517 cusecs
MEAN ANNUAL DISCHARGE FOR 16 YEARS:	379,000 acre feet

NAMOI RIVER AT MANILLA RAILWAY BRIDGE

Year 1952					Year 1953				
Month	Discharge in Cusecs			Discharge for Month Acre Feet	Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean			Max.	Min.	Mean	
Jan.	..	..	..	..	Jan.	292	51	97	5,998
Feb.	..	..	..	..	Feb.	3030	25	361	20,240
Mar.	..	..	..	..	Mar.	525	60	156	9,660
Apr.	..	..	..	..	Apr.	136	43	60	3,628
May	..	..	..	..	May	770	43	265	16,458
June	..	..	..	...	June	123	79	98	5,898
July	..	..	..	..	July	1010	79	178	11,050
Aug.	..	..	..	..	Aug.	2480	79	656	40,662
Sept.	..	..	..	..	Sept.	1660	147	388	23,282
Oct	..	..	..	..	Oct.	326	100	159	9,886
Nov.	654	123	240	14,418	Nov.	147	43	103	6,204
Dec.	830	20	87	5,422	Dec.	43	8	18	1,106
Total	..	..	..	..	Total	..	..	..	154,072

Year 1954					Year 1955				
Jan.	100	8	15	912	Jan.	405	25	121	7,496
Feb.	1380	6	117	6,558	Feb.	119000	25	6530	366,000
Mar.	200	16	61	3,794	Mar.	8500	280	1080	67,100
Apr.	20	10	12	716	Apr.	275	225	262	15,700
May	20	10	16	1,022	May	365	200	270	16,740
June	60	20	43	2,558	June	3930	305	736	44,150
July	123	25	53	3,266	July	2010	173	669	41,466
Aug.	123	32	57	3,524	Aug.	2750	515	1047	64,910
Sept.	405	25	88	5,280	Sept.	2010	335	666	39,960
Oct.	8300	60	777	48,196	Oct.	82200	275	5112	316,930
Nov.	22300	229	1864	111,860	Nov.	2570	365	924	55,420
Dec.	1010	60	171	10,618	Dec.	1075	250	453	28,110
Total	..	..	..	198,304	Total	..	..	..	1,063,982

Year 1956					Year 1957				
Jan.	800	147	279	17,300	Jan.	380	40	118	7,286
Feb.	100700	305	7450	432,110	Feb.	496	40	126	7,050
Mar.	30800	600	2742	169,994	Mar.	496	71	139	8,590
Apr.	6740	400	1121	67,242	Apr.	104	50	74	4,418
May	64400	1490	5022	311,372	May	104	43	64	3,962
June	29500	1150	3111	186,656	June	140	43	69	4,118
July	7350	1160	2692	166,880	July	166	83	114	7,066
Aug.	2860	562	1058	65,626	Aug.	545	83	139	8,608
Sept.	630	326	466	27,932	Sept.	243	43	104	6,256
Oct.	4250	275	775	48,066	Oct.	43	26	31	1,930
Nov.	1390	166	463	27,770	Nov.	74	6	21	1,276
Dec.	326	108	202	12,522	Dec.	210	5	24	1,482
Total	..	..	..	1,533,470	Total	..	..	..	62,042

Year 1958					Year 1959				
Jan.	3130	8	52	3,252	Jan.	1550	35	321	19,912
Feb.	174	18	46	2,582	Feb.	8300	58	644	36,084
Mar.	294	28	46	2,830	Mar.	4790	177	493	30,590
Apr.	22	13	15	918	Apr.	690	100	228	13,656
May	126	13	39	2,440	May	145	45	87	5,390
June	96	26	52	3,148	June	84	60	64	3,816
July	174	68	101	6,286	July	1550	50	288	17,882
Aug.	1100	60	168	10,404	Aug.	300	84	155	9,602
Sept.	1380	148	360	21,576	Sept.	610	50	138	8,262
Oct.	7510	126	759	47,030	Oct.	610	106	247	15,344
Nov.	209	35	103	6,166	Nov.	6000	148	585	35,110
Dec.	4450	22	355	21,964	Dec.	1550	106	328	20,318
Total	..	..	..	128,596	Total	..	..	..	215,966

NAMOI RIVER AT MANILLA RAILWAY BRIDGE

Year 1960					Year 1961				
Month	Discharge in Cusecs			Discharge for Month Acre Feet	Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean			Max.	Min.	Mean	
Jan.	236	32	94	5,860	Jan.	254	32	87	5,402
Feb.	391	32	84	4,876	Feb.	219	22	74	4,168
Mar.	143	32	65	4,058	Mar.	150	22	67	4,134
Apr.	186	32	54	3,228	Apr.	76	18	33	1,980
May	130	67	96	5,952	May	64	28	36	2,228
June	143	79	98	5,868	June	167	28	56	3,360
July	1450	104	546	33,870	July	219	34	62	3,840
Aug.	4720	202	793	49,164	Aug.	1450	76	293	18,150
Sept.	1500	130	283	17,006	Sept.	330	88	179	10,758
Oct.	370	79	169	10,486	Oct.	915	40	148	9,192
Nov.	2500	38	282	16,924	Nov.	14600	38	1494	89,658
Dec.	3510	117	395	24,460	Dec.	2730	143	587	36,396
Total	..	..	..	181,752	Total	..	..	..	189,266

Year 1962					Year 1963				
Jan.	73800	157	3549	220,066	Jan.	7040	136	650	40,306
Feb.	1200	210	538	30,138	Feb.	220	47	106	5,944
Mar.	290	117	183	11,338	Mar.	11700	30	266	16,470
Apr.	4060	117	426	25,576	Apr.	800	93	233	13,998
May	900	105	207	12,832	May	25000	203	3038	188,340
June	465	100	193	11,578	June	14800	620	2030	121,784
July	1820	100	304	18,846	July	1470	410	672	41,680
Aug.	2085	130	531	32,894	Aug.	6590	300	1057	65,550
Sept.	365	147	200	12,010	Sept.	4600	300	882	52,940
Oct.	7040	76	764	47,348	Oct.	2560	242	502	31,112
Nov.	1100	77	239	14,360	Nov.	1200	179	337	20,240
Dec.	525	66	145	8,970	Dec.	2660	171	551	34,182
Total	..	..	..	445,956	Total	..	..	..	632,546

Year 1964					Year 1965				
Jan.	205000	87	4794	297,228	Jan.	120	32	62	3,860
Feb.	490	152	304	17,616	Feb.	82	25	38	2,150
Mar.	1495	118	379	23,512	Mar.	107	14	26	1,610
Apr.	3520	102	341	20,438	Apr.	41	14	24	1,460
May	670	152	230	14,120	May	28	18	23	1,400
June	615	192	308	18,490	June	41	28	32	1,940
July	7820	245	1531	94,918	July	247	34	59	3,670
Aug.	3520	242	514	31,864	Aug.	80	39	51	3,160
Sept.	12400	242	599	35,938	Sept.	94	24	51	3,060
Oct.	4860	445	1361	84,358	Oct.	29	11	16	1,020
Nov.	1560	205	421	25,262	Nov.	41	1	10	590
Dec.	600	71	151	9,356	Dec.	3760	2	278	17,200
Total	..	..	..	673,100	Total	..	..	..	41,120

Year 1966					Year 1967				
Jan	18	1	7	424	Jan	603	57	177	11,000
Feb.	3	1	2	96	Feb.	57	8	21	1,180
Mar.	18	0.8	3	165	Mar	3970	8	226	14,000
Apr.	2	0.8	0.9	57	Apr.	132	28	61	3,670
May	3	1	2	134	May	132	28	48	2,950
June	32	12	23	1,354	June	1040	40	185	11,100
July	32	12	22	1,339	July	920	57	201	12,500
Aug.	2260	12	58	3,570	Aug.	465	57	171	10,600
Sept.	2260	53	143	8,610	Sept.	960	72	171	10,300
Oct.	570	53	190	11,800	Oct.	2880	40	474	29,400
Nov.	13500	155	1160	69,600	Nov.	300	27	100	5,990
Dec.	630	24	133	8,230	Dec.	35	13	21	1,330
Total	..	..	..	105,379	Total	..	..	..	114,020

Appendix 14.
Sheet 4

NAMOI RIVER AT MANILLA RAILWAY BRIDGE.

Year 1968

Month	Discharge in cusecs			Discharge for Month
	Max.	Min.	Mean	Acre Feet
Jan.	41600	8	1792	111,000
Feb.	258	43	106	6,170
Mar.	87	20	52	3,210
Apr.	20	2	9	552
May	900	9	93	5,790
June	222	75	114	6,830
July	1410	75	231	14,300
Aug.	6200	118	1360	84,600
Sept.	3820	262	895	53,700
Oct.	1020	96	229	14,200
Nov.	550	36	139	8,370
Dec.	131	28	43	2,640
Total	..	..	..	311,362

NAMOI RIVER AT KEEPIT

LOCATION:	Latitude 30°54' Longitude 150°29'
PERIOD OF ESTABLISHMENT:	December 1923 to Date
COMPLETE YEARS OF COMPUTED RECORDS:	45 years
ZERO OF GAUGE:	R.L.950.08 North West Water Conservation Datum
CATCHMENT AREA:	2,200 square miles
CONTROL:	Rock
EQUIPMENT:	Automatic Recorder (Pressure Type) installed December 1936. Removed December 1956 Automatic Recorder (Float Type) installed December 1956 Staff gauge, range 0-40 feet
CURRENT METER OBSERVATIONS:	(a) Number obtained : 324 (b) Maximum observation in cusecs : 24,900 (c) Minimum observation in cusecs : 0.2
MAXIMUM ESTIMATED DISCHARGE DURING PERIOD OF RECORDS:	194,000 cusecs
MEAN DAILY DISCHARGE FOR 45 YEARS	457 cusecs
MEAN ANNUAL DISCHARGE FOR 45 YEARS:	334,000 acre feet
REMARKS:	From 10th March 1960 flows were due to controlled releases from Keepit Dam.

NAMOI RIVER AT KEEPIT

Year 1923					Year 1924				
Month	Discharge in Cusecs			Discharge for Month Acre Feet	Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean			Max.	Min.	Mean	
Jan.	..	..	..	..	Jan.	2290	34	224	13,896
Feb.	..	..	..	..	Feb.	6400	90	937	54,372
Mar.	..	..	..	..	Mar.	226	44	127	7,640
Apr.	..	..	..	..	Apr.	246	44	93	5,782
May	..	..	..	..	May	148	62	105	6,504
June	..	..	..	..	June	350	62	151	9,048
July	..	..	..	..	July	1460	123	494	30,626
Aug.	..	..	..	..	Aug.	6060	161	424	26,302
Sept.	..	..	..	..	Sept.	1460	316	541	32,440
Oct.	..	..	..	..	Oct.	1155	485	737	45,686
Nov.	..	..	..	..	Nov.	21610	355	2999	179,960
Dec.	1215	0	106	5,914	Dec.	355	103	217	13,442
Total	..	..	..	..	Total	..	..	..	425,698

Year 1925					Year 1926				
Jan.	1760	74	194	11,998	Jan.	3200	36	414	25,648
Feb.	300	83	119	6,668	Feb.	326	7	82	4,606
Mar.	93	36	51	3,134	Mar.	255	1	23	1,424
Apr.	36	18	26	1,596	Apr.	300	50	128	7,694
May	166	18	80	4,954	May	765	103	264	16,376
June	217	43	73	4,410	June	1130	166	435	26,084
July	235	126	165	10,218	July	2270	166	527	32,684
Aug.	300	74	140	8,680	Aug.	502	182	247	15,334
Sept.	138	57	85	5,098	Sept.	255	182	191	11,490
Oct.	57	36	40	2,470	Oct.	665	74	183	11,350
Nov.	2100	36	277	16,622	Nov.	74	7	27	1,644
Dec.	765	24	105	6,516	Dec.	1760	3	203	12,616
Total	..	..	..	82,364	Total	..	..	..	166,950

Year 1927					Year 1928				
Jan.	4430	36	380	23,588	Jan.	255	126	159	9,872
Feb.	198	24	106	5,934	Feb.	14390	255	3209	186,112
Mar.	542	10	62	3,816	Mar.	18510	126	1571	97,396
Apr.	875	24	127	7,652	Apr.	11590	310	1178	70,700
May	83	24	36	2,240	May	310	101	167	10,328
June	43	24	29	1,766	June	12370	101	2539	152,336
July	30	7	16	998	July	12920	548	3084	191,234
Aug.	7	7	7	434	Aug.	2840	310	988	61,232
Sept.	7	4	6	364	Sept.	344	138	253	15,202
Oct.	83	5	18	1,110	Oct.	168	75	116	7,174
Nov.	2960	3	173	10,356	Nov.	224	63	90	5,412
Dec.	7230	126	1017	63,050	Dec.	138	31	69	4,264
Total	..	..	..	121,308	Total	..	..	..	811,262

Year 1929					Year 1930				
Jan	138	31	55	3,400	Jan.	63	0	8	489
Feb.	6400	18	1095	61,358	Feb.	63	0	13	749
Mar.	224	63	112	6,968	Mar.	2060	1	164	10,139
Apr.	2130	63	306	18,380	Apr.	178	31	65	3,902
May	63	37	46	2,858	May	45	16	29	1,776
June	63	37	44	2,656	June	11590	28	972	58,302
July	101	45	63	3,810	July	3630	224	750	46,532
Aug.	3630	53	526	32,610	Aug.	810	200	422	26,158
Sept.	8700	119	703	42,170	Sept.	508	119	210	12,628
Oct.	2060	75	303	18,768	Oct.	4750	87	725	44,976
Nov.	200	49	81	4,834	Nov.	2760	75	258	15,492
Dec.	63	5	18	1,106	Dec.	465	37	95	5,890
Total	..	..	..	198,918	Total	..	..	..	227,033

NAMOI RIVER AT KEEPIT

Year 1931					Year 1932				
Month	Discharge in Cusecs			Discharge for Month Acre Feet	Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean			Max.	Min.	Mean	
Jan.	87	4	25	1,546	Jan.	200	17	72	4,494
Feb.	588	0	36	1,988	Feb.	47	13	23	1,324
Mar.	2520	0.5	347	21,512	Mar.	78	13	30	1,828
Apr.	5410	87	546	32,762	Apr.	147	26	54	3,262
May	5980	119	1096	67,938	May	56	32	40	2,486
June	21400	720	2764	16,584	June	66	39	44	2,640
July	8960	720	2415	149,728	July	458	56	124	7,702
Aug.	950	310	598	37,098	Aug.	126	47	74	4,602
Sept.	382	158	231	13,870	Sept.	3310	56	829	49,750
Oct.	310	63	145	8,986	Oct.	3950	187	663	41,124
Nov.	310	53	107	6,430	Nov.	870	78	239	14,342
Dec.	13200	63	1414	87,646	Dec.	330	54	102	6,350
Total	..	..	..	446,088	Total	..	..	..	139,904

Year 1933					Year 1934				
Jan.	7150	4	729	45,202	Jan.	1275	78	305	18,910
Feb.	980	36	166	9,280	Feb.	8440	172	1480	82,868
Mar.	36	2	15	958	Mar.	630	108	218	13,542
Apr.	71	4	23	1,388	Apr.	458	78	165	9,878
May	49	8	23	1,414	May	100	78	86	5,302
June	252	32	96	5,788	June	172	78	99	5,966
July	1820	78	723	44,856	July	7490	92	456	28,264
Aug.	2510	164	600	37,190	Aug.	2130	437	848	52,592
Sept.	1610	187	463	27,786	Sept.	21610	375	2425	145,536
Oct.	14020	231	2348	145,602	Oct.	8440	231	1259	78,044
Nov.	4830	675	1771	106,280	Nov.	765	147	365	21,882
Dec.	1860	247	679	42,120	Dec.	1725	126	491	30,466
Total	..	..	..	467,864	Total	..	..	..	493,250

Year 1935					Year 1936				
Jan.	15210	264	2212	137,162	Jan.	212	9	56	3,510
Feb.	416	85	260	14,582	Feb.	740	21	116	6,708
Mar.	100	56	75	4,666	Mar.	1850	92	317	19,686
Apr	108	47	61	3,642	Apr.	357	100	162	9,730
May	72	47	59	3,658	May	107	49	71	4,392
June	56	43	49	2,946	June	115	54	80	4,814
July	186	78	93	5,782	July	1910	124	557	34,542
Aug.	117	56	65	4,046	Aug.	6920	143	870	53,926
Sept.	1427	56	178	10,674	Sept.	1740	107	404	24,218
Oct.	1290	66	312	19,358	Oct.	133	32	76	4,708
Nov.	153	29	64	3,840	Nov.	44	14	26	1,560
Dec.	460	11	54	3,374	Dec.	980	14	90	5,596
Total	..	..	..	213,730	Total	..	..	..	173,390

Year 1937					Year 1938				
Jan.	184	17	88	5,432	Jan.	455	32	139	8,626
Feb.	840	17	78	4,360	Feb.	2220	17	204	11,402
Mar.	5620	23	311	19,284	Mar.	279	5	23	1,448
Apr.	62	31	43	2,608	Apr.	253	1	46	2,762
May	66	41	56	3,444	May	2100	24	171	10,584
June	184	41	116	6,962	June	1190	32	146	8,778
July	710	66	167	10,348	July	204	32	54	3,368
Aug.	1550	89	388	24,084	Aug.	7270	181	849	52,692
Sept.	1390	116	299	17,916	Sept.	455	97	202	12,134
Oct.	1140	41	206	12,000	Oct.	1290	97	177	10,976
Nov.	1190	65	300	17,994	Nov.	1880	97	311	18,654
Dec	560	52	165	10,272	Dec.	306	7	69	4,258
Total	..	..	..	134,704	Total	..	..	..	145,682

NAMOI RIVER AT KEEPIT

Year 1939					Year 1940				
Month	Discharge in Cusecs			Discharge for Month Acre Feet	Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean			Max.	Min.	Mean	
Jan.	2050	5	120	7,420	Jan.	540	5	32	2,002
Feb.	97	2	34	1,919	Feb.	5390	4	230	13,358
Mar.	7040	1	382	23,672	Mar.	80	1	20	1,250
Apr.	1218	24	99	5,968	Apr.	525	7	59	3,564
May	33	16	23	1,430	May	17	10	11	694
June	38	16	23	1,390	June	508	9	20	1,172
July	413	33	121	7,514	July	10	7	9	584
Aug.	1032	55	277	17,164	Aug.	253	6	16	1,006
Sept.	245	33	86	5,186	Sept.	84	3	12	744
Oct.	245	24	78	4,832	Oct.	159	3	17	1,064
Nov.	465	43	134	8,076	Nov.	4270	1	134	8,022
Dec.	2360	24	169	10,476	Dec.	6030	33	429	26,724
Total	..	..	..	95,047	Total	..	..	..	60,184

Year 1941					Year 1942				
Jan.	11750	147	1196	74,164	Jan.	69	0	6	394
Feb.	24900	98	824	46,130	Feb.	1620	13	164	9,208
Mar.	12600	73	1551	96,186	Mar.	1673	8	80	4,998
Apr.	440	73	152	9,112	Apr.	194	10	62	3,732
May	74	53	63	3,910	May	43	10	14	844
June	1930	73	768	46,080	June	33	16	25	1,494
July	400	149	256	15,900	July	18690	24	1648	102,182
Aug.	299	77	129	8,008	Aug.	440	89	225	13,978
Sept.	160	50	85	5,086	Sept.	159	80	97	5,806
Oct.	970	50	145	9,008	Oct.	6930	52	944	58,526
Nov.	1220	53	160	9,578	Nov.	2640	159	518	31,084
Dec.	430	5	35	2,186	Dec.	2890	73	298	18,460
Total	..	..	..	325,348	Total	..	..	..	250,706

Year 1943					Year 1944				
Jan.	18850	219	2334	144,688	Jan.	3360	121	574	35,600
Feb.	430	43	125	7,006	Feb.	850	59	197	11,434
Mar.	43	20	27	1,702	Mar.	66	16	30	1,860
Apr.	104	20	37	2,182	Apr.	26	16	19	1,140
May	85	28	41	2,548	May	810	16	126	7,822
June	147	62	87	5,232	June	230	52	72	4,334
July	114	62	78	4,822	July	1090	52	301	18,682
Aug.	578	85	259	16,078	Aug.	7270	100	1032	63,986
Sept.	3360	136	351	21,058	Sept.	850	159	303	18,156
Oct.	2220	172	452	28,040	Oct.	159	40	85	5,268
Nov.	1190	100	318	19,054	Nov.	46	16	27	1,612
Dec.	720	52	165	10,232	Dec.	32	7	12	770
Total	..	..	..	262,642	Total	..	..	..	170,664

Year 1945					Year 1946				
Jan.	3990	3	174	10,778	Jan.	6000	4	251	15,572
Feb.	1470	16	244	13,682	Feb.	490	12	52	2,920
Mar.	780	11	108	6,672	Mar.	22	7	11	674
Apr.	91	7	14	858	Apr.	100	18	39	2,358
May	91	11	29	1,784	May	78	18	39	2,442
June	6340	32	514	30,816	June	27	12	17	1,046
July	3490	122	542	33,578	July	89	18	39	2,426
Aug.	810	198	342	21,174	Aug.	22	10	15	904
Sept.	1820	198	401	24,032	Sept.	122	4	19	1,114
Oct.	222	40	96	5,976	Oct.	78	5	20	1,234
Nov.	198	18	47	2,810	Nov.	2340	4	79	4,796
Dec.	222	9	37	2,302	Dec.	950	2	39	2,408
Total	..	..	..	154,462	Total	..	..	..	37,894

NAMOI RIVER AT KEEPIT

Year 1947					Year 1948				
Month	Discharge in Cusecs			Discharge for Month Acre Feet	Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean			Max.	Min.	Mean	
Jan.	18530	0	263	16,336	Jan.	7270	151	1190	73,800
Feb.	6230	55	647	36,258	Feb.	4680	53	96	5,586
Mar.	3240	33	381	23,616	Mar.	4680	73	289	17,920
Apr.	147	20	52	3,106	Apr.	173	53	61	3,654
May	104	24	44	2,700	May	430	62	109	6,744
June	137	24	53	3,184	June	2850	53	833	49,984
July	104	33	53	3,260	July	1032	239	519	32,188
Aug.	617	38	112	6,922	Aug.	7620	129	524	32,504
Sept.	2480	104	486	29,136	Sept.	2910	187	481	28,884
Oct.	1465	85	392	24,292	Oct.	502	68	167	10,364
Nov.	1516	125	262	15,712	Nov.	483	40	112	6,736
Dec.	15710	364	2168	134,390	Dec.	122	32	60	3,718
Total	..	..	..	298,912	Total	..	..	..	272,082

Year 1949					Year 1950				
Jan.	2420	20	200	12,414	Jan.	1020	97	191	11,840
Feb.	1465	32	199	11,152	Feb.	3100	81	411	22,998
Mar.	187	32	85	5,278	Mar.	209	47	82	5,090
Apr.	332	32	86	5,182	Apr.	780	66	239	14,348
May	228	53	86	5,308	May	267	97	121	7,506
June	2360	78	454	27,236	June	15250	155	2800	167,998
July	11650	122	634	39,300	July	85260	1170	6283	389,536
Aug.	37200	151	1981	122,816	Aug.	3740	1080	1877	116,388
Sept.	31200	1120	4052	243,098	Sept.	2130	610	923	55,406
Oct.	21040	780	2796	173,330	Oct.	14800	688	3833	237,678
Nov.	11210	255	1007	60,406	Nov.	45200	900	6071	364,308
Dec.	1250	134	367	22,760	Dec.	2750	410	1037	64,300
Total	..	..	..	728,280	Total	..	..	..	1,457,396

Year 1951					Year 1952				
Jan.	1290	294	471	29,218	Jan.	70	18	38	2,344
Feb.	750	214	357	2,014	Feb.	574	7	91	5,290
Mar.	337	156	220	13,640	Mar.	574	18	169	10,506
Apr.	240	136	167	10,026	Apr.	202	44	87	5,242
May	167	136	150	9,290	May	2750	44	354	21,920
June	4850	136	710	42,612	June	11600	253	1909	114,510
July	4100	424	843	52,282	July	1280	305	585	36,290
Aug.	6950	453	1430	88,698	Aug.	36500	495	3975	246,440
Sept.	770	226	389	23,330	Sept.	1180	395	708	42,508
Oct.	322	70	146	9,082	Oct.	18050	337	2211	137,078
Nov.	70	25	49	2,950	Nov.	1030	118	297	17,808
Dec.	34	25	30	1,846	Dec.	730	40	115	7,110
Total	..	..	..	284,988	Total	..	..	..	647,046

Year 1953					Year 1954				
Jan.	575	52	128	7,958	Jan.	66	0	10	617
Feb.	2790	30	417	23,378	Feb.	2020	3	186	10,412
Mar.	690	66	174	10,784	Mar.	279	30	86	5,326
Apr.	138	98	105	6,320	Apr.	40	21	34	2,050
May	770	138	366	22,684	May	21	18	20	1,224
June	279	98	169	10,166	June	No Records			2,558
July	890	98	240	14,890	July	No Records			3,266
Aug.	2430	138	666	41,308	Aug.	No Records			3,524
Sept.	1960	201	489	29,328	Sept.	No Records			5,280
Oct.	610	201	263	16,292	Oct.	5300	67	967	59,970
Nov.	251	40	139	8,338	Nov.	3750	287	926	55,568
Dec.	40	5	18	1,126	Dec.	474	201	293	18,186
Total	..	..	..	192,572	Total	..	..	..	167,981

* Estimated

NAMOI RIVER AT KEEPIT

Year 1955					Year 1956				
Month	Discharge in Cusecs			Discharge for Month Acre Feet	Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean			Max.	Min.	Mean	
Jan.	1080	5	208	12,904	Jan.	No Records			17,300
Feb.	169000	14	7893	441,996	Feb.	130500	305	8031	465,772
Mar.	No Records			70,000*	Mar.	30800	700	2799	173,548
Apr.	No Records			15,700*	Apr.	6800	546	1108	66,456
May	No Records			16,740*	May	65000	1570	5164	320,166
June	No Records			44,150*	June	26700	1360	3191	191,486
July	No Records			41,466*	July	7400	1160	2703	167,606
Aug.	2000	490	972	60,274	Aug.	2975	641	1064	65,940
Sept.	1210	304	584	35,068	Sept.	653	477	552	33,134
Oct.	86000	248	4580	283,946	Oct.	3480	364	800	49,586
Nov.	No Records			55,420*	Nov.	1450	210	476	28,556
Dec.	No Records			28,110*	Dec.	323	137	216	13,382
Total	..	..	..	1,105,774*	Total	..	..	..	1,592,932

Year 1957					Year 1958				
Jan.	313	84	152	9,414	Jan.	1020	3	60	3,734
Feb.	306	84	142	7,950	Feb.	90	28	48	2,706
Mar.	266	105	132	8,208	Mar.	66	26	39	2,394
Apr.	105	74	91	5,436	Apr.	26	12	18	1,056
May	80	54	62	3,854	May	100	12	33	2,044
June	160	62	83	4,964	June	75	30	43	2,586
July	200	90	125	7,732	July	182	57	98	6,088
Aug.	740	80	164	10,186	Aug.	1510	50	182	11,280
Sept.	440	80	165	9,914	Sept.	1510	147	385	23,072
Oct.	80	28	53	3,296	Oct.	6570	220	822	50,958
Nov.	80	5	29	1,710	Nov.	202	13	96	5,772
Dec.	124	3	36	2,218	Dec.	2830	4	296	18,328
Total	..	..	..	74,902	Total	..	..	..	130,018

Year 1959					Year 1960				
Jan.	920	13	248	15,346	Jan.	550	2	269	16,668
Feb.	650	2	185	10,340	Feb.	65	6	50	2,888
Mar.	1440	185	539	33,438	Mar.	154	4	99	6,108
Apr.	590	65	269	16,120	Apr.	137	7	111	6,682
May	119	30	58	3,608	May	116	26	75	4,622
June	98	55	71	4,232	June	63	14	44	2,626
July	640	65	393	24,368	July	260	0.3	12	745
Aug.	610	6	402	24,954	Aug.	116	5	8	482
Sept.	165	2	54	3,212	Sept.	35	3	8	510
Oct.	560	2	264	16,380	Oct.	1480	3	12	762
Nov.	580	140	445	26,670	Nov.	63	6	13	792
Dec.	550	30	437	27,092	Dec.	920	3	25	1,550
Total	..	..	..	205,760	Total	..	..	..	44,435

Year 1961					Year 1962				
Jan.	590	2	11	668	Jan.	35800	4	2525	156,600
Feb.	No Records			1,000*	Feb.	950	66	866	48,500
Mar.	No Records			1,800*	Mar.	845	15	742	46,000
Apr.	680	3	101	6,068	Apr.	810	2	105	6,300
May	670	13	77	4,790	May	740	4	96	5,950
June	1020	5	92	5,550	June	775	5	103	6,180
July	500	2	10	602	July	915	5	187	11,600
Aug.	600	2	10	592	Aug.	880	5	465	28,800
Sept.	635	2	6	331	Sept.	880	4	507	30,400
Oct.	670	2	227	1,400	Oct.	950	8	595	36,900
Nov.	845	2	21	1,250	Nov.	2085	58	1323	79,400
Dec.	1680	4	247	15,300	Dec.	2330	5	789	48,900
Total	..	..	..	39,351*	Total	..	..	..	505,530

* Estimated

NAMOI RIVER AT KEEPIT

Year 1963					Year 1964				
Month	Discharge in Cusecs			Discharge for Month Acre Feet	Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean			Max.	Min.	Mean	
Jan.	775	4	125	7,770	Jan.	194000	11	4130	256,000
Feb.	810	4	161	9,030	Feb.	920	58	767	44,500
Mar.	845	5	174	10,800	Mar.	920	24	309	19,200
Apr.	810	2	57	3,420	Apr.	1230	58	263	15,800
May	6440	2	1625	100,700	May	640	2	394	24,500
June	10100	35	1860	112,000	June	885	2	278	16,700
July	870	180	822	51,000	July	5460	4	1030	63,900
Aug.	2930	10	839	52,000	Aug.	820	9	734	45,500
Sept.	3370	73	1038	62,300	Sept.	820	4	480	28,800
Oct.	900	58	838	52,000	Oct.	1580	760	945	58,600
Nov.	870	11	437	26,200	Nov.	850	175	822	49,300
Dec.	840	11	508	31,500	Dec.	880	11	470	29,100
Total	..	..	..	518,720	Total	..	..	..	651,900

Year 1965					Year 1966				
Jan.	850	11	374	23,200	Jan.	950	99	746	46,300
Feb.	820	8	346	19,400	Feb.	820	200	665	37,200
Mar.	820	8	224	13,900	Mar.	760	53	334	20,700
Apr.	171	90	119	7,130	Apr.	111	90	101	6,050
May	80	63	71	4,370	May	90	54	72	4,490
June	130	35	63	3,770	June	73	12	30	1,800
July	640	20	76	4,690	July	27	10	18	1,140
Aug.	640	35	137	8,480	Aug.	80	9	29	1,830
Sept.	700	11	303	18,200	Sept.	54	2	16	960
Oct.	700	15	499	30,900	Oct.	66	2	12	746
Nov.	760	11	477	28,600	Nov.	305	3	61	3,640
Dec.	880	8	261	16,200	Dec.	570	9	325	20,100
Total	..	..	..	178,840	Total	..	..	..	144,956

Year 1967					Year 1968				
Jan.	800	2	517	32,100	Jan.	750	1	158	9,810
Feb.	740	424	641	35,900	Feb.	1070	550	735	42,600
Mar.	420	6	86	5,310	Mar.	610	9	173	10,700
Apr.	148	43	58	3,510	Apr.	530	43	86	5,160
May	122	32	65	4,020	May	305	2.5	36	2,260
June	43	6	18	1,050	June	9	3	6.6	400
July	18	1	5.6	346	July	25	5	6	370
Aug.	305	4	40	2,490	Aug.	7.5	6	6.7	414
Sept.	470	43	188	11,300	Sept.	7.5	6	6.5	387
Oct.	520	9	212	13,200	Oct.	325	6	111	6,870
Nov.	470	9	216	13,000	Nov.	480	7.5	194	11,700
Dec.	700	54	393	24,400	Dec.	610	19	305	18,900
Total	..	..	..	146,626	Total	..	..	..	109,571

MOOKI RIVER AT BREEZA

LOCATION:	Latitude 30°16' Longitude 150°27'
PERIOD OF ESTABLISHMENT:	September 1957 to date
COMPLETE YEARS OF COMPUTED RECORDS:	11 years
ZERO OF GAUGE:	R.L.75.03 Assumed Datum (Approximately 930 feet above mean sea level)
CATCHMENT AREA:	1,400 square miles
CONTROL:	Gravel
EQUIPMENT:	Staff gauge, range 0-25 feet.
CURRENT METER OBSERVATION:	(a) Number obtained : 109
	(b) Maximum observation in cusecs : 5,500
	(c) Minimum observation in cusecs : 0.1
MAXIMUM ESTIMATED DISCHARGE DURING PERIOD OF RECORDS:	6,040 cusecs
MEAN DAILY DISCHARGE FOR 11 YEARS:	56 cusecs
MEAN ANNUAL DISCHARGE FOR 11 YEARS:	41,000 acre feet.

MOOKI RIVER AT BREEZA

Year 1957					Year 1958				
Month	Discharge in cusecs			Discharge for Month Acre Feet	Month	Discharge in cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean			Max.	Min.	Mean	
Jan.	..	..	..	..	Jan.	48	1	3	198
Feb.	..	..	..	..	Feb.	135	1	25	1,416
Mar.	..	..	..	..	Mar.	2	1	2	90
Apr.	..	..	..	..	Apr.	2	1	2	88
May	..	..	..	..	May	8	1	3	179
June	..	..	..	..	June	3	2	2	134
July	..	..	..	..	July	41	5	10	654
Aug.	..	..	..	..	Aug.	6	5	6	374
Sept.	23	3	8	456	Sept.	1900	6	108	6,450
Oct.	3	2	3	172	Oct.	4590	6	366	22,700
Nov.	2	1	2	92	Nov.	18	2	7	404
Dec.	2	1	1	89	Dec.	125	0.9	25	1,520
Total	..	..	..	..	Total	..	..	..	34,207

Year 1959					Year 1960				
Jan.	105	4	23	1,412	Jan.	4	1	2	134
Feb.	400	3	48	2,700	Feb.	2	0.8	1	64
Mar.	1640	14	142	8,810	Mar.	0.8	0.8	0.8	50
Apr.	145	8	22	1,296	Apr.	7	0.8	3	160
May	11	6	7	422	May	4	3	3	205
June	12	8	10	570	June	4	3	3	193
July	77	8	30	1,850	July	43	3	12	732
Aug.	41	12	22	1,342	Aug.	506	2	126	7,790
Sept.	14	8	9	558	Sept.	41	1	8	454
Oct.	8	8	8	496	Oct.	8	4	6	370
Nov.	17	4	8	462	Nov.	176	4	30	1,776
Dec.	9	4	5	324	Dec.	2300	8	984	61,000
Total	..	..	..	20,242	Total	..	..	..	72,928

Year 1961					Year 1962				
Jan.	940	4	167	10,378	Jan.	820	8	53	3,263
Feb.	4	0.8	2	102	Feb.	820	10	88	4,931
Mar.	6	0.8	3	161	Mar.	10	2	34	2,080
Apr.	4	2	2	114	Apr.	73	2	16	983
May	3	2	2	114	May	271	4	38	2,372
June	4	2	2	115	June	43	6	174	1,046
July	5	2	4	248	July	73	4	8	483
Aug.	20	4	6	373	Aug.	294	6	39	2,404
Sept.	4	4	4	228	Sept.	15	10	11	671
Oct.	4	2	3	182	Oct.	1480	4	110	6,810
Nov.	125	4	12	749	Nov.	271	10	122	7,310
Dec.	820	4	41	2,566	Dec.	62	6	22	1,333
Total	..	..	..	15,330	Total	..	..	..	33,686

Year 1963					Year 1964				
Jan.	5820	6	352	21,800	Jan.	183	0.5	41	2,530
Feb.	139	10	33	1,826	Feb.	4	2	3	169
Mar.	32	2	92	571	Mar.	580	2	57	3,515
Apr.	139	97	118	7,080	Apr.	6040	2	635	38,100
May	1680	67	188	11,674	May	400	21	80	4,936
June	2540	58	281	16,876	June	2600	21	313	18,780
July	430	49	89	5,520	July	1280	52	227	14,060
Aug.	1300	36	159	9,840	Aug.	95	34	45	2,810
Sept.	540	27	125	7,510	Sept.	2600	27	142	8,520
Oct.	475	19	56	3,498	Oct.	1060	27	211	13,112
Nov.	27	21	23	1,386	Nov.	161	6	23	1,408
Dec.	84	2	32	1,983	Dec.	4	0.5	2	96
Total	..	..	..	89,564	Total	..	..	..	108,036

MOOKI RIVER AT BREEZA

Year 1965					Year 1966				
Month	Discharge in Cusecs			Discharge for Month Acre feet	Month	Discharge in Cusecs			Discharge for Month Acre feet
	Max.	Min.	Mean			Max.	Min.	Mean	
Jan.	0.5	0.5	0.5	31	Jan.	0.5	0.5	0.5	31
Feb.	0.5	0.2	0.4	21	Feb.	0.5	0.5	0.5	28
Mar.	2	0.7	1	82	Mar.	0.5	0.4	0.5	28
Apr.	2	2	1	90	Apr.	0.5	0.5	0.5	30
May	2	2	1	93	May	0.5	0.5	0.5	31
June	2	2	1	90	June	0.5	0.5	0.5	30
July	2	2	1	93	July	0.5	0.5	0.5	31
Aug.	2	2	1	93	Aug.	700	0.5	18	1,124
Sept.	2	1	2	101	Sept.	67	1	5	275
Oct.	0.5	0.5	0.5	31	Oct.	260	1	24	1,450
Nov.	0.5	0.2	0.4	24	Nov.	3500	1	205	12,300
Dec.	2600	0.5	88	5,435	Dec.	24	1	4	234
Total	..	..	..	6,184	Total	..	..	..	15,592

Year 1967					Year 1968				
Jan.	2	0.3	1	84	Jan.	2670	0	252	15,600
Feb.	0.5	0	0	3	Feb.	2.3	0	0.6	33
Mar.	2300	0	64	3,940	Mar.	0	0	0	0
Apr.	0.5	0.3	0.5	29	Apr.	0	0	0	0
May	2	0.5	0.8	49	May	2950	0	236	14,600
June	0.5	0.5	0.5	30	June	12	3.1	4.2	253
July	49	0.5	5.6	344	July	161	2.3	19.6	1,212
Aug.	34	0.5	8.3	517	Aug.	2600	2.3	267	16,580
Sept.	52	0.5	9	540	Sept.	306	4	57	3,420
Oct.	106	0.5	14	852	Oct.	306	2.3	67	4,150
Nov.	5.5	0	1	62	Nov.	2.3	0	0.5	27
Dec.	0	0	0	0	Dec.	4	0	0.6	37
Total	..	..	..	6,450	Total	..	..	..	55,912

NAMOI RIVER AT GUNNEDAH

LOCATION:	Latitude 30°59' Longitude 150°15'
PERIOD OF ESTABLISHMENT:	November 1891 to date
COMPLETE YEARS OF COMPUTED RECORDS:	77 years
ZERO GAUGE:	R.L.834.15 North West Water Conservation Datum
CATCHMENT AREA:	6,600 square miles
CONTROL:	Gravel
EQUIPMENT:	Automatic Recorder (Pressure Type) installed May 1962 Staff gauge, range 0-30 feet.
CURRENT METER OBSERVATIONS:	(a) Number obtained : 401 (b) Maximum observation in cusecs : 22,500 (c) Minimum observation in cusecs : 0.1
MAXIMUM ESTIMATED DISCHARGE DURING PERIOD OF RECORDS:	119,000 cusecs
MEAN DAILY DISCHARGE FOR 77 YEARS: (See Remarks)	770 cusecs
MEAN ANNUAL DISCHARGE FOR 77 YEARS: (See Remarks)	563,000 acre feet
REMARKS:	As from March 1960 flows were partly due to controlled releases from Keepit Dam.

NAMOI RIVER AT GUNNEDAH

Year 1891					Year 1892				
Month	Discharge in cusecs			Discharge for Month Acre Feet	Month	Discharge in cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean			Max.	Min.	Mean	
Jan.	..	..	..	..	Jan.	953	411	608	37,698
Feb.	..	..	..	..	Feb.	411	268	307	17,852
Mar.	..	..	..	..	Mar.	456	286	373	23,130
Apr.	..	..	..	..	Apr.	2220	306	924	55,466
May	..	..	..	..	May	872	411	559	34,682
June	..	..	..	..	June	2525	953	1436	86,144
July	..	..	..	..	July	3930	846	1484	91,988
Aug.	..	..	..	..	Aug.	2170	286	758	46,988
Sept.	..	..	..	..	Sept.	19400	795	3530	211,776
Oct.	..	..	..	..	Oct.	7640	1270	3182	197,260
Nov.	..	..	..	..	Nov.	19400	1065	7767	466,030
Dec.	5270	648	1512	93,748	Dec.	2475	1865	2168	134,440
Total	..	..	..	..	Total	..	..	..	1,403,454

Year 1893					Year 1894				
Jan.	3490	215	923	57,226	Jan.	1270	22	176	10,918
Feb.	7640	286	1373	76,898	Feb.	22	22	22	1,232
Mar.	17100	648	3289	203,954	Mar.	17600	22	4185	259,458
Apr.	4770	599	1260	75,580	Apr.	14650	456	2440	146,386
May	4650	411	1607	99,610	May	1865	150	759	47,094
June	18000	411	5677	340,586	June	2475	953	1459	87,532
July	13430	1009	3135	194,398	July	6000	367	1526	94,610
Aug.	22200	1225	5362	332,440	Aug.	6000	648	1508	93,524
Sept.	3765	648	1771	106,248	Sept.	3765	648	1606	96,370
Oct.	4110	648	1628	100,910	Oct.	12140	326	2564	158,964
Nov.	3280	456	1101	66,072	Nov.	1715	48	499	29,956
Dec.	456	22	188	11,688	Dec.	795	48	208	12,916
Total	..	..	..	1,665,610	Total	..	..	..	1,038,960

Year 1895					Year 1896				
Jan.	10400	22	1369	84,890	Jan	795	8	103	6,394
Feb.	2895	32	766	42,914	Feb.	7640	70	1116	64,732
Mar.	22	22	22	1,364	Mar.	2170	150	510	31,626
Apr.	22	22	22	1,320	Apr.	250	32	76	4,552
May	22	22	22	1,364	May	122	32	51	3,164
June	22	22	22	1,320	June	2015	70	521	31,276
July	22	22	22	1,364	July	2370	150	727	45 058
Aug.	22	22	22	1,364	Aug.	3930	150	949	58,860
Sept.	150	22	43	2,584	Sept.	2785	411	898	53,860
Oct.	1315	22	195	12,060	Oct.	411	70	145	8,982
Nov.	10260	22	989	59,340	Nov.	367	22	52	3,106
Dec.	2320	22	470	29,140	Dec.	367	14	153	9,474
Total	..	..	..	239,024	Total	..	..	..	321,084

Year 1897					Year 1898				
Jan.	5210	14	472	29,250	Jan.	6550	22	513	31,786
Feb.	70	22	39	2,192	Feb.	16200	22	1951	109,242
Mar.	22	22	22	1,364	Mar.	95	22	29	1,824
Apr.	22	22	22	1,320	Apr.	22	22	22	1,320
May	70	22	36	2,228	May	32	22	23	1,404
June	48	22	38	2,252	June	648	22	107	6,416
July	15080	22	1186	73,520	July	215	22	71	4,388
Aug.	953	70	273	16,952	Aug.	1270	22	165	10,256
Sept.	648	2	158	9,466	Sept.	2625	22	356	21,386
Oct.	953	70	280	17,390	Oct.	22	22	22	1,364
Nov.	95	22	54	3,252	Nov.	22	22	22	1,320
Dec.	2170	22	446	27,674	Dec.	22	1	6	348
Total	..	..	..	186,860	Total	..	..	..	191,054

NAMOI RIVER AT GUNNEDAH

Year 1899					Year 1900				
Month	Discharge in cusecs			Discharge for Month Acre Feet	Month	Discharge in cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean			Max.	Min.	Mean	
Jan.	1	1	1	62	Jan.	4	1	1	72
Feb.	1	1	1	56	Feb.	70	1	6	346
Mar.	1	1	1	62	Mar.	1270	4	69	4,296
Apr.	150	2	16	982	Apr	215	8	28	1,686
May	2	2	2	124	May	953	4	117	7,276
June	215	2	24	1,410	June	15800	48	3014	180,860
July	1565	4	181	11,192	July	67600	648	4747	294,294
Aug.	9440	8	850	52,676	Aug.	3655	286	1057	65,516
Sept.	899	70	203	12,188	Sept.	648	150	241	14,464
Oct.	899	14	154	9,572	Oct.	150	8	35	2,194
Nov.	502	14	66	3,964	Nov.	8	8	8	480
Dec.	8	2	5	332	Dec.	846	8	112	6,918
Total	..	..	..	92,620	Total	..	..	..	578,402

Year 1901					Year 1902				
Jan.	8	4	6	360	Jan.	48	0	12	770
Feb.	4	0	2	126	Feb.	0	0	0	0
Mar.	70	0	6	344	Mar.	0	0	0	0
Apr.	4	2	2	148	Apr.	0	0	0	0
May	14	2	4	248	May	0	0	0	0
June	2370	4	337	20,222	June	0	0	0	0
July	1270	70	331	20,506	July	0	0	0	0
Aug.	10740	95	1840	114,082	Aug.	0	0	0	0
Sept.	3440	70	624	37,460	Sept.	648	0	43	2,600
Oct.	648	32	401	24,884	Oct.	150	2	17	1,080
Nov.	1415	150	491	29,464	Nov.	8	2	2	144
Dec.	150	70	88	5,454	Dec.	4710	8	365	22,602
Total	..	..	..	253,298	Total	..	..	..	27,196

Year 1903					Year 1904				
Jan.	110	0	8	524	Jan.	398	161	195	12,092
Feb.	0	0	0	0	Feb.	1865	110	182	10,534
Mar.	466	0	25	1,552	Mar.	6830	189	773	47,944
Apr.	10050	4	737	45,712	Apr.	10880	12	1183	70,974
May	6000	4	654	40,566	May	432	0	72	4,448
June	14330	7	1526	94,634	June	366	0	82	4,940
July	975	4	128	7,932	July	12990	110	2880	178,540
Aug.	3545	67	1179	73,132	Aug.	1465	398	727	45,086
Sept.	14810	161	3570	214,178	Sept.	701	12	190	11,424
Oct.	14330	1270	4086	253,356	Oct.	2170	12	661	40,958
Nov.	8040	508	2899	173,924	Nov.	274	245	251	15,048
Dec.	2785	110	678	42,070	Dec.	245	49	190	11,802
Total	..	..	..	947,580	Total	..	..	..	453,790

Year 1905					Year 1906				
Jan.	745	12	177	10,980	Jan.	189	110	152	9,460
Feb.	217	110	154	8,630	Feb.	203	110	165	9,240
Mar.	217	135	173	10,722	Mar.	880	161	338	20,960
Apr.	2785	189	1252	75,120	Apr.	245	161	195	11,704
May	274	110	134	8,288	May	245	161	193	11,970
June	2675	67	917	55,012	June	245	189	215	12,880
July	880	12	272	16,882	July	245	189	210	13,006
Aug.	432	12	97	6,000	Aug.	304	189	231	14,316
Sept.	217	49	121	7,276	Sept.	975	189	440	26,426
Oct.	148	67	96	5,982	Oct.	1125	161	459	28,458
Nov.	148	12	104	6,226	Nov.	466	161	269	16,146
Dec.	148	87	115	7,106	Dec.	366	161	229	14,240
Total	..	..	..	218,224	Total	..	..	..	188,806

NAMOI RIVER AT GUNNEDAH

Year 1907					Year 1908				
Month	Discharge in cusecs			Discharge for Month	Month	Discharge in cusecs			Discharge for Month
	Max.	Min.	Mean	Acre Feet		Max.	Min.	Mean	Acre Feet
Jan.	466	161	294	18,226	Jan.	975	189	496	30,774
Feb.	366	161	251	14,084	Feb.	14810	366	2067	119,894
Mar.	7640	161	2412	149,518	Mar.	48500	366	4960	307,500
Apr.	2895	1270	1938	116,300	Apr.	2015	578	993	59,578
May	1270	466	835	51,776	May	880	274	521	32,324
June	1915	245	676	40,582	June	701	274	435	26,076
July	578	217	355	21,992	July	789	274	413	25,586
Aug.	6270	304	1674	103,818	Aug.	9440	539	1915	18,716
Sept.	578	161	290	17,432	Sept.	18200	502	4118	247,074
Oct.	161	49	104	6,456	Oct.	1125	578	745	46,172
Nov.	1075	49	285	17,078	Nov.	1125	274	551	33,088
Dec.	18800	217	2338	144,934	Dec.	9440	274	1708	105,908
Total	..	..	..	702,196	Total	..	..	..	1,052,690

Year 1909					Year 1910				
Jan.	274	49	128	7,936	Jan.	89500	274	7094	439,796
Feb.	1270	49	635	35,538	Feb.	1415	701	1085	60,780
Mar.	578	110	345	21,400	Mar.	2015	398	998	61,894
Apr.	366	49	145	8,722	Apr.	834	304	521	31,286
May	189	67	133	8,246	May	745	189	351	21,768
June	7230	110	870	52,228	June	2015	366	815	48,894
July	6200	466	1256	77,842	July	3115	1270	2005	124,340
Aug.	14810	366	2820	174,818	Aug.	3930	578	1648	102,196
Sept.	3765	834	1776	106,588	Sept.	1270	366	675	40,486
Oct.	834	334	553	34,294	Oct.	975	274	552	34,238
Nov.	2015	189	733	43,970	Nov.	1715	578	1120	67,224
Dec.	1125	189	583	36,148	Dec.	1200	231	603	37,382
Total	..	..	..	607,730	Total	..	..	..	1,070,284

Year 1911					Year 1912				
Jan.	6100	25	876	54,298	Jan.	25	2	7	466
Feb.	12810	415	2126	119,066	Feb.	520	2	48	2,798
Mar.	3200	231	742	45,994	Mar.	77	0	11	674
Apr.	231	25	100	6,016	Apr.	0	0	0	0
May	231	5	68	4,208	May	2	0	0	8
June	319	25	76	4,560	June	950	0	192	11,496
July	5310	40	852	52,796	July	2090	231	854	52,970
Aug.	1340	77	282	17,464	Aug.	767	319	503	31,204
Sept.	638	25	264	15,844	Sept.	767	148	274	16,464
Oct.	903	319	630	39,070	Oct.	1100	0	88	5,450
Nov.	5500	0	612	36,726	Nov.	767	98	377	22,672
Dec.	10780	9	1486	92,138	Dec.	520	0	41	2,530
Total	..	..	..	488,180	Total	..	..	..	146,732

Year 1913					Year 1914				
Jan.	520	0	133	8,250	Jan.	767	25	380	23,602
Feb.	231	0	17	962	Feb.	767	25	382	21,428
Mar.	148	0	25	1,542	Mar.	767	25	139	8,662
Apr.	5	0	4	230	Apr.	767	25	202	12,162
May	10,273	5	147	90,578	May	25	0	9	600
June	3520	520	1481	108,880	June	903	40	282	16,936
July	20380	598	2395	148,494	July	382	175	271	16,850
Aug.	680	260	445	27,596	Aug.	175	77	142	8,840
Sept.	260	148	201	12,060	Sept.	77	25	56	3,406
Oct.	319	25	166	10,280	Oct.	382	15	86	5,366
Nov.	319	148	225	13,538	Nov	1490	98	344	20,672
Dec.	319	77	119	7,362	Dec.	1490	58	251	15,620
Total	..	..	..	429,772	Total	..	.	..	154,144

NAMOI RIVER AT GUNNEDAH

Year 1915					Year 1916				
Month	Discharge in cusecs			Discharge for Month Acre Feet	Month	Discharge in cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean			Max.	Min.	Mean	
Jan.	857	77	207	12,880	Jan.	148	15	43	2,878
Feb.	122	1	21	1,178	Feb.	857	25	247	14,374
Mar.	58	0	17	1,080	Mar.	638	0	106	6,610
Apr.	175	0	30	1,844	Apr.	767	0	279	16,772
May	1050	32	214	13,284	May	148	15	72	4,480
June	680	25	120	7,236	June	3850	0	516	30,984
July	13930	148	1620	100,464	July	4020	580	1469	91,128
Aug.	767	231	449	27,870	Aug.	9205	520	2429	150,616
Sept.	2505	122	517	31,044	Sept.	8140	319	1043	62,722
Oct.	319	148	188	11,692	Oct.	3360	449	1182	73,332
Nov.	148	5	38	2,292	Nov.	2985	449	932	55,948
Dec.	638	4	168	10,426	Dec.	16030	950	4958	307,430
Total	..	..	..	222,290	Total	..	..	..	817,274

Year 1917					Year 1918				
Jan.	8540	1050	3353	207,920	Jan.	14140	412	1570	97,356
Feb.	3910	5	1031	57,780	Feb.	2250	231	718	40,252
Mar.	175	122	140	8,720	Mar.	520	107	349	21,662
Apr.	122	77	103	6,222	Apr.	179	107	144	8,662
May	122	98	110	6,844	May	107	15	63	3,942
June	203	98	138	8,320	June	15	15	15	900
July	148	98	136	8,476	July	15	15	15	900
Aug.	98	98	98	6,076	Aug.	1340	15	568	35,256
Sept.	15610	98	3232	200,384	Sept.	1050	412	757	45,422
Oct.	2450	415	1197	74,222	Oct.	412	204	298	18,508
Nov.	16450	319	4906	294,380	Nov.	204	107	158	9,538
Dec.	4800	549	1319	81,790	Dec.	107	5	49	3,074
Total	..	..	..	961,134	Total	..	..	..	285,472

Year 1919					Year 1920				
Jan.	154	0	35	2,182	Jan.	2560	26	465	28,840
Feb.	69	0	7	406	Feb.	1050	5	266	15,442
Mar.	259	1	21	1,342	Mar.	8	0	1	90
Apr.	1	0	0.8	48	Apr.	0	0	0	0
May	0.5	0	0	2	May	107	0	38	2,364
June	204	0	117	7,078	June	16553	0	1005	60,272
July	69	5	33	2,062	July	17290	580	4217	261,482
Aug.	69	15	40	2,454	Aug.	13562	259	2824	175,140
Sept.	46	15	28	1,684	Sept.	14956	580	3238	194,280
Oct.	259	15	101	6,262	Oct.	2880	259	462	28,626
Nov.	15	0	3	168	Nov.	549	107	291	17,440
Dec.	2250	0	302	18,941	Dec.	2880	69	509	31,592
Total	..	..	..	42,629	Total	..	..	..	815,568

Year 1921					Year 1922				
Jan.	52	3	17	1,028	Jan.	3550	196	1110	69,000
Feb.	26	0	6	342	Feb.	196	122	155	8,690
Mar.	7340	8	1048	64,974	Mar.	800	110	232	14,400
Apr.	4930	15	534	32,058	Apr.	164	97	126	7,580
May	1050	69	319	23,800	May	97	71	82	5,110
June	14700	967	4329	259,762	June	122	71	92	5,540
July	46000	800	5900	366,000	July	995	110	303	18,800
Aug.	2960	536	1130	70,000	Aug.	800	110	337	20,900
Sept.	1710	460	757	45,400	Sept.	510	122	258	15,500
Oct.	24840	460	3240	201,000	Oct.	196	135	160	9,890
Nov.	1670	320	635	38,100	Nov.	460	38	126	7,550
Dec.	24840	196	1060	66,000	Dec.	2180	38	552	34,200
Total	..	..	..	1,168,464	Total	..	..	..	217,160

NAMOI RIVER AT GUNNEDAH

Year 1923					Year 1924				
Month	Discharge in cusecs			Discharge for Month Acre Feet	Month	Discharge in cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean			Max.	Min.	Mean	
Jan.	460	38	111	6,878	Jan.	460	110	220	13,610
Feb.	38	0	10	564	Feb.	8310	196	1265	73,394
Mar.	0	0	0	0	Mar.	388	135	212	13,120
Apr.	15	0	3	192	Apr.	460	110	224	13,446
May	0	0	0	0	May	341	76	206	12,744
June	800	0	82	4,924	June	505	76	212	12,702
July	1670	196	512	31,732	July	1420	137	688	42,674
Aug.	800	135	283	17,574	Aug.	4000	240	525	32,532
Sept.	9150	164	1193	71,610	Sept.	2340	332	690	41,406
Oct.	275	150	179	11,124	Oct.	3050	398	890	55,188
Nov.	180	71	130	7,792	Nov.	11980	332	3541	212,450
Dec.	620	6	118	7,340	Dec.	760	160	469	29,098
Total	..	..	..	159,730	Total	..	..	..	552,364

Year 1925					Year 1926				
Jan.	687	76	277	17,172	Jan.	2430	45	347	21,530
Feb.	332	45	109	6,126	Feb.	269	11	91	5,110
Mar.	160	45	60	3,732	Mar.	24	2	8	516
Apr.	45	17	31	1,840	Apr.	2180	95	475	28,496
May	160	11	49	3,052	May	2700	115	565	35,052
June	76	11	50	3,008	June	1200	241	732	43,896
July	332	58	211	13,066	July	2180	196	614	38,088
Aug.	332	115	210	12,890	Aug.	540	290	356	22,060
Sept.	269	76	181	10,870	Sept.	540	196	342	20,538
Oct.	76	11	30	1,876	Oct.	760	83	323	20,058
Nov.	2605	24	361	21,656	Nov.	67	4	27	1,634
Dec	332	58	132	8,220	Dec.	2180	4	254	15,766
Total	..	..	..	103,508	Total	..	..	..	252,744

Year 1927					Year 1928				
Jan.	5090	241	747	46,300	Jan.	196	53	124	7,720
Feb.	540	42	348	19,598	Feb.	16070	118	2145	124,406
Mar.	540	32	95	5,888	Mar.	16600	95	1716	106,382
Apr.	540	32	99	5,930	Apr.	7130	401	1325	82,168
May	136	42	71	4,422	May	401	145	213	13,214
June	42	32	40	2,420	June	12750	145	2493	149,576
July	32	32	32	1,984	July	10650	740	3313	205,392
Aug.	32	23	27	1,714	Aug.	2700	468	921	57,082
Sept.	23	23	23	1,380	Sept.	468	238	332	19,930
Oct.	23	4	10	612	Oct.	238	120	190	11,764
Nov.	760	4	54	3,234	Nov.	120	41	71	4,232
Dec.	3850	118	536	33,358	Dec.	41	14	21	1,284
Total	..	..	..	126,840	Total	..	..	..	783,150

Year 1929					Year 1930				
Jan.	14	14	14	868	Jan.	670	0	65	4,048
Feb.	3325	14	1127	63,108	Feb.	55	0.5	8	436
Mar.	270	55	105	6,486	Mar.	1150	0.5	132	8,217
Apr.	1358	55	265	15,928	Apr.	120	4	27	1,614
May	55	41	43	2,682	May	20	4	9	558
June	41	41	41	2,460	June	19170	14	1459	87,556
July	55	41	47	2,906	July	7090	498	1464	90,744
Aug.	5100	55	587	36,412	Aug.	1040	457	652	40,448
Sept.	7800	206	1113	66,784	Sept.	682	217	393	23,576
Oct.	885	145	356	22,066	Oct.	5350	143	868	53,800
Nov.	270	55	120	7,222	Nov.	1120	112	364	21,854
Dec.	95	5	42	2,606	Dec.	296	27	120	7,436
Total	..	..	..	229,528	Total	..	..	..	340,287

NAMOI RIVER AT GUNNEDAH

Year 1931					Year 1932				
Month	Discharge in cusecs			Discharge for Month Acre Feet	Month	Discharge in cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean			Max.	Min.	Mean	
Jan.	179	15	49	3,054	Jan.	237	38	111	6,906
Feb.	416	0	38	2,124	Feb.	77	15	34	1,944
Mar.	1510	0	368	22,833	Mar.	112	4	33	2,074
Apr.	3950	143	687	41,202	Apr.	59	32	48	2,894
May	11580	179	1467	90,930	May	67	32	41	2,514
June	31400	954	4526	271,576	June	67	44	53	3,180
July	27370	1250	4760	295,138	July	703	51	195	12,088
Aug.	1510	642	1003	62,190	Aug.	179	67	82	5,082
Sept.	828	316	512	30,724	Sept.	3950	51	1079	64,768
Oct.	580	161	297	18,424	Oct.	5190	416	888	55,038
Nov.	621	112	243	14,614	Nov.	996	112	421	25,260
Dec.	12240	99	1631	101,118	Dec.	217	67	128	7,948
Total	..	..	..	953,927	Total	..	..	..	189,696

Year 1933					Year 1934				
Jan.	9950	1	1161	71,994	Jan.	2380	150	682	42,282
Feb.	1550	26	293	16,422	Feb.	9980	490	2290	128,224
Mar.	37	1	11	678	Mar.	1860	150	491	30,466
Apr.	26	1	9	530	Apr.	610	128	273	16,368
May	17	0	4	254	May	162	57	108	6,702
June	560	5	135	8,082	June	230	57	79	4,752
July	3320	249	1366	84,676	July	6540	220	634	39,280
Aug.	4730	323	1139	70,634	Aug.	5030	1060	2408	149,300
Sept.	3010	5	726	43,570	Sept.	29050	370	5259	315,560
Oct.	23990	286	4114	255,090	Oct.	16470	260	2728	169,110
Nov.	8750	1155	2934	176,034	Nov.	2380	330	670	40,180
Dec.	4200	550	1066	66,100	Dec.	1650	230	582	36,090
Total	..	..	..	794,064	Total	..	..	..	978,314

Year 1935					Year 1936				
Jan.	20070	350	3669	227,480	Jan.	620	0	116	7,198
Feb.	700	265	447	25,006	Feb.	1400	13	230	13,368
Mar.	355	87	213	13,178	Mar.	2390	74	516	31,996
Apr.	150	64	90	5,392	Apr.	354	90	182	10,936
May	115	87	99	6,166	May	128	46	69	4,288
June	130	81	107	6,402	June	150	40	66	3,950
July	215	87	116	7,214	July	2740	169	887	54,980
Aug.	170	87	126	7,798	Aug.	19400	315	2090	129,602
Sept.	620	93	221	13,248	Sept.	2640	193	532	31,904
Oct.	2430	130	447	27,714	Oct.	177	83	122	7,592
Nov.	660	34	167	10,038	Nov.	79	16	50	3,012
Dec.	500	31	180	11,148	Dec.	435	7	108	6,722
Total	..	..	..	360,784	Total	..	..	..	305,548

Year 1937					Year 1938				
Jan.	405	27	148	9,132	Jan.	230	8	69	4,296
Feb.	405	18	66	3,700	Feb.	890	15	262	14,648
Mar.	6410	16	432	26,782	Mar.	11	0	2	140
Apr.	95	34	49	2,948	Apr.	74	0	23	1,364
May	80	42	50	3,118	May	1050	15	126	7,838
June	280	50	152	9,128	June	330	38	105	6,310
July	250	101	146	9,072	July	200	38	72	4,484
Aug.	5590	147	828	51,352	Aug.	8790	189	1332	82,594
Sept.	3030	158	621	37,260	Sept.	630	160	334	20,026
Oct.	1260	111	333	20,676	Oct.	720	116	211	13,076
Nov.	2050	92	394	23,664	Nov.	1400	63	329	19,738
Dec.	3350	48	303	18,800	Dec.	840	2	179	11,068
Total	..	..	..	215,632	Total	..	..	..	185,582

NAMOI RIVER AT GUNNEDAH

Year 1939					Year 1940				
Month	Discharge in cusecs			Discharge for Month Acre Feet	Month	Discharge in cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean			Max.	Min.	Mean	
Jan.	1250	0	81	5,018	Jan.	380	0	69	4,270
Feb.	68	0	7	412	Feb.	6760	0.1	429	24,890
Mar.	7470	0	687	42,568	Mar.	43	0	7	490
Apr.	500	29	150	9,014	Apr.	2480	6	219	13,118
May	48	5	21	1,314	May	38	6	13	836
June	43	6	19	1,118	June	103	0.6	18	1,128
July	525	34	158	9,826	July	8	4	6	384
Aug.	1050	85	400	24,822	Aug.	91	0	16	1,022
Sept.	290	33	110	6,612	Sept.	25	0	3	204
Oct.	290	25	102	6,312	Oct.	34	0	5	306
Nov.	420	48	176	10,532	Nov.	7970	0	409	24,538
Dec.	1400	10	259	16,062	Dec.	13300	29	1082	67,094
Total	..	..	..	133,610	Total	..	..	..	138,280

Year 1941					Year 1942				
Jan.	31800	185	2798	173,490	Jan.	5	0	0.7	44
Feb.	14900	95	838	46,950	Feb.	720	0	106	5,909
Mar.	25000	95	3297	204,428	Mar.	800	0	81	5,014
Apr.	630	145	309	18,544	Apr.	330	5	61	3,650
May	230	109	137	8,476	May	29	0	3	216
June	4220	200	1038	62,266	June	25	8	13	819
July	720	290	486	30,160	July	35000	32	3492	216,572
Aug.	275	152	206	12,800	Aug.	670	169	379	23,480
Sept.	260	68	136	8,206	Sept.	230	130	161	9,634
Oct.	1225	73	384	23,832	Oct.	9450	109	1740	107,872
Nov.	760	79	305	18,328	Nov.	6550	280	1150	68,996
Dec.	169	1	26	1,596	Dec.	2300	115	391	24,242
Total	..	..	..	609,076	Total	..	..	..	466,448

Year 1943					Year 1944				
Jan.	16100	380	2127	131,852	Jan.	2330	174	908	56,298
Feb.	880	60	231	12,926	Feb.	1700	82	452	26,234
Mar.	55	14	29	1,794	Mar.	82	8	27	1,666
Apr.	70	12	34	2,062	Apr.	19	7	12	748
May	130	23	43	2,646	May	1550	10	180	11,154
June	415	88	163	9,768	June	330	70	118	7,052
July	181	88	123	7,650	July	1650	70	431	26,712
Aug.	830	163	387	23,966	Aug.	19470	140	1899	117,756
Sept.	3400	225	470	28,196	Sept.	1340	205	503	30,210
Oct.	3200	328	822	50,942	Oct.	338	63	155	9,630
Nov.	1820	181	443	26,552	Nov.	49	10	23	1,414
Dec.	1210	63	354	21,932	Dec.	14	3	7	462
Total	..	..	..	320,286	Total	..	..	..	289,336

Year 1945					Year 1946				
Jan.	3630	1	211	13,112	Jan.	5030	2	277	17,192
Feb.	2200	23	387	21,646	Feb.	350	20	74	4,126
Mar.	1900	15	265	16,414	Mar.	51	2	15	928
Apr.	55	12	22	1,318	Apr.	128	2	35	2,100
May	380	15	71	4,402	May	65	10	30	1,858
June	13900	50	1515	90,892	June	112	13	42	2,534
July	4000	212	688	42,656	July	112	31	63	3,926
Aug.	1800	280	619	38,354	Aug.	31	0	10	620
Sept.	5050	225	1001	60,090	Sept.	128	0	7	428
Oct.	295	88	178	11,010	Oct.	75	0	15	920
Nov.	250	46	115	6,880	Nov.	1650	0	78	4,662
Dec.	280	26	108	6,674	Dec.	350	0	60	3,734
Total	..	..	..	313,448	Total	..	..	..	43,028

NAMOI RIVER AT GUNNEDAH

Year 1947

Month	Discharge in cusecs			Discharge for Month
	Max.	Min.	Mean	Acre Feet
Jan.	8000	0	426	26,406
Feb.	10610	15	1377	77,110
Mar.	4720	24	551	34,172
Apr.	135	4	34	2,068
May	90	4	28	1,716
June	119	7	38	2,288
July	135	15	44	2,740
Aug.	585	45	158	9,806
Sept.	6640	169	836	50,158
Oct.	3850	152	697	43,210
Nov.	755	208	389	23,324
Dec.	13320	390	4053	251,312
Total	..	..	..	524,310

Year 1948

Month	Discharge in cusecs			Discharge for Month
	Max.	Min.	Mean	Acre Feet
Jan.	18360	375	2526	156,612
Feb.	350	86	179	10,354
Mar.	6900	112	611	37,874
Apr.	112	75	90	5,430
May	435	86	176	10,880
June	3500	65	961	57,658
July	1350	375	674	41,760
Aug.	8150	200	898	55,654
Sept.	3950	366	849	50,966
Oct.	755	119	300	18,614
Nov.	440	66	173	10,356
Dec.	188	55	94	5,848
Total	..	..	..	462,006

Year 1949

Jan.	3050	66	324	20,070
Feb.	1150	66	340	19,064
Mar.	440	78	167	10,332
Apr.	440	66	144	8,656
May	318	78	157	9,760
June	4100	152	1014	60,824
July	12500	272	1281	79,394
Aug.	20380	342	2300	142,576
Sept.	24840	1400	7026	421,584
Oct.	19600	1340	5058	313,616
Nov.	15300	504	2103	126,206
Dec.	2810	303	871	53,992
Total	..	..	..	1,266,074

Year 1950

Jan.	789	275	457	28,362
Feb.	1430	175	735	41,200
Mar.	943	86	212	13,160
Apr.	28600	232	7060	424,000
May	664	200	292	18,120
June	23400	333	6106	366,342
July	52000	2360	9882	612,682
Aug.	12100	2030	4325	268,160
Sept.	3210	1050	1498	89,900
Oct.	31100	1100	8403	520,972
Nov.	41400	2220	11270	676,222
Dec.	6950	1050	2300	142,620
Total	..	..	..	3,201,740

Year 1951

Jan.	1840	817	1110	68,820
Feb.	1320	555	820	45,928
Mar.	682	291	415	25,754
Apr.	391	214	298	17,858
May	321	237	262	16,242
June	8010	237	1487	89,236
July	7950	863	1918	118,942
Aug.	10700	1010	2958	183,380
Sept.	1650	537	899	53,926
Oct.	808	204	369	22,894
Nov.	204	96	150	9,026
Dec.	167	66	90	5,560
Total	..	..	..	657,566

Year 1952

Jan.	204	33	71	4,414
Feb.	493	25	77	4,452
Mar.	1710	80	450	27,880
Apr.	326	131	193	11,582
May	5350	113	931	57,716
June	19600	537	4192	251,530
July	5990	808	1517	94,078
Aug.	30400	1010	7178	445,062
Sept.	2670	906	1668	100,086
Oct.	13000	761	2478	153,614
Nov.	1380	269	554	33,252
Dec.	326	131	196	12,134
Total	..	..	..	1,195,800

Year 1953

Jan.	1010	96	239	14,804
Feb.	1600	66	364	20,366
Mar.	808	113	241	14,916
Apr.	204	96	118	7,076
May	1710	113	735	45,584
June	296	185	221	13,288
July	1430	185	416	25,778
Aug.	4200	204	1318	81,714
Sept.	3700	259	784	47,024
Oct.	564	187	289	17,910
Nov.	464	87	192	11,524
Dec.	115	19	47	2,942
Total	..	..	..	302,926

Year 1954

Jan.	75	14	29	1,798
Feb.	4000	19	659	36,898
Mar.	472	25	103	6,408
Apr.	25	19	23	1,356
May	25	14	19	1,158
June	196	25	84	5,030
July	174	53	86	5,332
Aug.	174	80	110	6,850
Sept.	334	42	91	5,452
Oct.	12300	80	1247	77,326
Nov.	20400	510	3105	186,292
Dec.	1840	153	395	24,472
Total	..	..	..	358,372

NAMOI RIVER AT GUNNEDAH

Year 1955					Year 1956				
Month	Discharge in cusecs			Discharge for Month Acre Feet	Month	Discharge in cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean			Max.	Min.	Mean	
Jan.	670	80	263	16,328	Jan.	1550	289	534	33,094
Feb.	119000	96	9826	550,238	Feb.	60300	549	9686	561,804
Mar.	23700	670	3240	200,908	Mar.	16200	1270	3579	221,890
Apr.	629	367	494	29,620	Apr.	5010	833	1654	99,262
May	670	367	442	27,392	May	19200	1270	8032	497,958
June	4030	472	977	58,598	June	19700	2520	5665	339,896
July	2590	549	1108	68,702	July	16900	2770	7090	440,000
Aug.	6110	863	1881	116,620	Aug.	15500	1595	3903	241,968
Sept.	2590	670	1211	72,634	Sept.	1670	1080	1335	80,080
Oct.	39000	549	5358	332,222	Oct.	7000	933	1843	114,254
Nov.	5090	910	1922	115,300	Nov.	2270	444	1031	61,884
Dec.	1650	589	894	55,456	Dec.	1470	356	609	37,744
Total	..	..	..	1,644,018	Total	..	..	..	2,729,834

Year 1957					Year 1958				
Jan.	933	189	377	23,350	Jan.	569	19	82	5,088
Feb.	709	152	288	16,108	Feb.	490	40	148	8,308
Mar.	833	152	312	19,372	Mar.	101	29	53	3,288
Apr.	596	119	224	13,414	Apr.	31	13	21	1,266
May	280	160	197	12,238	May	225	8	62	3,872
June	280	160	187	11,220	June	116	45	73	4,354
July	490	223	320	19,864	July	990	116	241	14,912
Aug.	1270	211	341	21,126	Aug.	2650	150	446	27,662
Sept.	884	128	305	18,286	Sept.	5840	360	1132	67,900
Oct.	128	44	76	4,704	Oct.	15800	605	2301	142,650
Nov.	76	8	34	2,044	Nov.	560	115	267	16,042
Dec.	87	6	28	1,764	Dec.	5210	88	706	43,744
Total	..	..	..	163,490	Total	..	..	..	339,086

Year 1959					Year 1960				
Jan.	1425	115	506	31,398	Jan.	820	80	365	22,330
Feb.	1750	88	474	26,542	Feb.	192	65	118	6,870
Mar.	5000	335	963	59,678	Mar.	149	33	90	5,606
Apr.	830	182	428	25,702	Apr.	248	65	116	6,954
May	182	98	140	8,686	May	217	86	140	8,660
June	380	114	143	8,560	June	114	86	101	6,062
July	1520	182	561	34,758	July	2910	99	680	42,178
Aug.	850	260	475	29,464	Aug.	4950	208	831	51,530
Sept.	630	87	182	10,916	Sept.	2180	168	388	23,280
Oct.	980	86	454	28,138	Oct.	335	110	189	11,726
Nov.	1810	350	726	43,550	Nov.	4860	76	554	33,264
Dec.	2310	284	784	48,584	Dec.	1660	205	1692	104,890
Total	..	..	..	355,976	Total	..	..	..	323,350

Year 1961					Year 1962				
Jan.	920	110	247	15,290	Jan.	23700	217	3378	209,456
Feb.	144	80	108	6,048	Feb.	3120	1090	1637	91,660
Mar.	200	90	118	7,290	Mar.	1090	470	897	55,590
Apr.	200	100	155	9,298	Apr.	785	132	262	15,716
May	160	130	147	9,092	May	900	108	314	19,500
June	180	63	126	7,588	June	810	150	367	22,000
July	180	50	85	5,284	July	1150	113	321	19,906
Aug.	1460	68	253	15,698	Aug.	2650	137	852	52,808
Sept.	240	50	119	7,154	Sept.	1025	152	642	38,500
Oct.	350	45	96	5,964	Oct.	9160	152	1311	81,270
Nov.	4690	43	696	41,786	Nov.	2900	575	1523	91,400
Dec.	5770	130	720	44,632	Dec.	1800	170	920	57,100
Total	..	..	..	175,124	Total	..	..	..	754,906

NAMOI RIVER AT GUNNEDAH

Year 1963					Year 1964				
Month	Discharge in Cusecs			Discharge for Month Acre Feet	Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean			Max.	Min.	Mean	
Jan.	5050	170	904	56,100	Jan.	50800	415	3240	201,000
Feb.	765	150	271	15,200	Feb.	1090	810	923	53,500
Mar.	430	132	200	12,400	Mar.	1850	190	554	34,400
Apr.	520	98	184	11,000	Apr.	9380	120	1031	61,900
May	14200	132	3300	205,000	May	1330	250	754	46,700
June	15000	1330	3950	237,000	June	3350	250	927	55,636
July	2820	1380	1610	99,660	July	12200	495	2622	163,000
Aug.	7100	550	1981	123,000	Aug.	4730	295	1216	75,400
Sept.	8730	1230	2013	121,000	Sept.	3600	385	758	45,478
Oct.	1480	1130	1270	78,700	Oct.	6110	1090	1928	119,564
Nov.	1280	415	680	40,800	Nov.	1400	930	1074	64,440
Dec.	1320	375	721	44,700	Dec.	1140	178	568	35,200
Total	..	..	..	1,044,560	Total	..	..	..	956,218

Year 1965					Year 1966				
Jan.	570	290	405	25,120	Jan.	730	480	624	38,680
Feb.	430	325	377	21,140	Feb.	730	430	634	35,480
Mar.	570	84	222	13,774	Mar.	950	75	360	22,312
Apr.	132	84	101	6,072	Apr.	97	85	87	5,196
May	99	60	77	4,804	May	85	34	65	4,026
June	71	60	70	4,172	June	109	12	38	2,254
July	132	60	83	5,148	July	28	0	12	758
Aug.	153	84	141	8,754	Aug.	290	0	57	3,568
Sept.	690	84	288	17,284	Sept.	140	22	56	3,330
Oct.	690	178	497	30,832	Oct.	400	41	86	5,300
Nov.	570	153	435	26,126	Nov.	4750	58	551	33,000
Dec.	2680	84	381	23,634	Dec.	580	185	361	22,400
Total	..	..	..	186,860	Total	..	..	..	176,304

Year 1967					Year 1968				
Jan.	1720	320	624	38,700	Jan.	18600	260	1870	116,000
Feb.	630	460	608	34,100	Feb.	1175	555	721	41,800
Mar.	1780	22	218	13,500	Mar.	595	30	204	12,700
Apr.	65	28	40	2,400	Apr.	212	42	74	4,410
May	106	22	56	3,460	May	2650	60	330	20,400
June	62	17	31	1,860	June	310	70	117	7,000
July	85	28	52	3,210	July	4750	70	423	26,300
Aug.	205	28	110	6,820	Aug.	9310	160	1846	114,000
Sept.	450	125	240	14,400	Sept.	3060	275	727	43,600
Oct.	915	140	339	21,000	Oct.	2830	275	495	30,700
Nov.	370	160	203	12,200	Nov.	570	165	299	17,900
Dec.	730	230	405	25,100	Dec.	610	71	338	20,900
Total	..	..	..	176,750	Total	..	..	..	455,710

NAMOI RIVER AT BOGGABRI

LOCATION:	Latitude 30°40' Longitude 150°04'
PERIOD OF ESTABLISHMENT:	June 1936 to date
COMPLETE YEARS OF COMPUTED RECORDS:	32 years
ZERO OF GAUGE:	R.L. 755.24 North West Water Conservation Datum
CATCHMENT AREA:	8,700 square miles
CONTROL:	Indurated Clay
EQUIPMENT:	Automatic Recorder (Pressure Type) installed February 1937 Staff Gauge, range 0-30 feet
CURRENT METER OBSERVATIONS:	(a) Number obtained : 264 (b) Maximum observation in cusecs : 12,300 (c) Minimum observation in cusecs : 0.2
MAXIMUM ESTIMATED DISCHARGE DURING PERIOD OF RECORDS:	150,000 cusecs
MEAN DAILY DISCHARGE FOR 32 YEARS: (See Remarks)	1,056 cusecs
MEAN ANNUAL DISCHARGE FOR 32 YEARS: (See Remarks)	771,000 acre feet
REMARKS:	As from March 1960 flows were partly due to controlled releases from Keepit Dam

NAMOI RIVER AT BOGGABRI

Year 1937

Month	Discharge in cusecs Max.	Min.	Mean	Discharge for Month Acre Feet
Jan.	No Records			9,100*
Feb.	No Records			3,700*
Mar.	3920	28	459	28,458
Apr.	192	40	76	4,572
May	36	28	34	2,136
June	410	36	158	9,460
July	760	97	263	16,280
Aug.	4910	150	791	49,030
Sept.	3100	203	721	43,268
Oct.	1240	117	328	20,346
Nov.	1360	103	411	24,636
Dec.	1630	60	240	14,894
Total	..	..	..	225,880*

Year 1938

Month	Discharge in cusecs Max.	Min.	Mean	Discharge for Month Acre Feet
Jan.	990	12	84	5,204
Feb.	1930	23	322	18,052
Mar.	23	3	10	602
Apr.	40	1	4	240
May	1250	12	103	6,390
June	358	55	174	10,434
July	230	55	93	5,794
Aug.	7120	266	1559	96,660
Sept.	910	150	312	18,736
Oct.	692	131	223	13,852
Nov.	1030	97	272	16,348
Dec.	440	2	73	4,498
Total	..	..	..	196,810

Year 1939

Jan.	970	0.5	74	4,558
Feb.	50	0.5	8	437
Mar.	6210	0	489	30,343
Apr.	635	34	149	8,942
May	55	19	34	2,096
June	28	12	19	1,164
July	543	28	224	13,916
Aug.	1180	199	435	26,988
Sept.	385	36	100	5,992
Oct.	215	36	86	5,342
Nov.	385	45	135	8,110
Dec.	840	28	195	12,086
Total	..	..	..	119,974

Year 1940

Jan.	435	4	63	3,900
Feb.	3475	2	305	17,664
Mar.	20	2	8	470
Apr.	2050	2	168	10,108
May	74	4	24	1,460
June	37	1	9	544
July	4	4	4	248
Aug.	74	1	14	864
Sept.	1	0	0.2	14
Oct.	2	0	0.7	41
Nov.	1340	0	80	4,818
Dec.	7650	74	917	56,852
Total	..	..	..	96,983

Year 1941

Jan.	37000	351	4528	280,736
Feb.	7110	136	767	42,952
Mar.	28800	55	3950	244,884
Apr.	701	136	302	18,120
May	157	55	92	5,688
June	3180	178	1054	63,268
July	556	245	399	24,750
Aug.	318	139	197	12,190
Sept.	305	83	166	9,980
Oct.	110	83	220	13,642
Nov.	418	105	185	11,454
Dec.	83	10	31	1,932
Total	..	..	..	729,596

Year 1942

Jan.	10	0	2	110
Feb.	648	0	160	8,978
Mar.	985	1	106	6,552
Apr.	385	1	67	4,048
May	1	0	0	4
June	23	2	12	738
July	48400	23	4919	304,948
Aug.	830	199	410	25,148
Sept.	285	164	214	13,384
Oct.	9010	146	1618	100,332
Nov.	5330	328	979	58,726
Dec.	2560	179	387	24,024
Total	..	..	..	546,992

Year 1943

Jan.	16100	380	2127	131,852
Feb.	360	82	202	11,312
Mar.	82	28	44	2,698
Apr.	36	21	27	1,636
May	45	18	29	1,780
June	415	88	163	9,768
July	135	80	102	6,118
Aug.	800	72	383	23,730
Sept.	880	260	463	27,794
Oct.	2720	435	934	57,900
Nov.	2210	310	637	38,210
Dec.	790	182	370	22,928
Total	..	..	..	335,726

Year 1944

Jan	2295	274	1106	68,544
Feb.	1700	82	452	26,234
Mar.	82	8	27	1,650
Apr.	24	7	15	876
May	1240	15	192	11,932
June	535	46	158	9,466
July	1420	72	387	24,000
Aug.	16600	115	1785	110,646
Sept	1410	220	448	26,850
Oct.	310	58	142	8,828
Nov.	53	10	29	1,754
Dec.	10	1	5	283
Total	..	..	..	291,063

* Estimated

NAMOI RIVER AT BOGGABRI

Year 1945

Month	Discharge in cusecs Max.	Min.	Mean	Discharge for Month Acre Feet
Jan.	2710	1	207	12,840
Feb.	2200	23	387	21,646
Mar.	1900	15	265	16,414
Apr.	55	12	22	1,318
May	380	15	71	4,402
June	13900	50	1515	90,892
July	4000	212	688	42,656
Aug.	1800	280	619	38,354
Sept.	5050	225	1001	60,090
Oct.	295	88	178	11,010
Nov.	250	46	115	6,880
Dec.	278	19	98	6,094
Total	..	..	..	312,596

Year 1946

Month	Discharge in cusecs Max.	Min.	Mean	Discharge for Month Acre Feet
Jan.	3760	16	287	17,838
Feb.	135	63	76	4,250
Mar.	51	2	15	928
Apr.	45	16	30	1,812
May	65	10	30	1,858
June	40	17	23	1,372
July	63	26	47	2,934
Aug.	31	0	10	620
Sept.	6	0	2	100
Oct.	54	0	15	900
Nov.	870	0	55	3,326
Dec.	560	8	69	4,280
Total	..	..	..	40,218

Year 1947

Jan.	7610	0	88	5,454
Feb.	19400	247	1646	92,202
Mar.	2600	1	589	36,496
Apr.	82	15	31	1,890
May	101	19	37	2,268
June	48	15	29	1,718
July	91	5	35	2,190
Aug.	720	34	132	8,204
Sept.	5500	211	887	53,214
Oct.	2950	164	768	47,594
Nov.	755	208	389	23,324
Dec.	13320	390	4053	251,312
Total	..	..	..	525,866

Year 1948

Jan.	18231	360	2588	160,510
Feb.	360	82	182	10,584
Mar.	4810	101	663	41,104
Apr.	82	64	71	4,272
May	360	64	173	10,724
June	3112	64	962	57,776
July	1360	385	715	44,310
Aug.	6513	211	829	51,388
Sept.	3693	335	832	49,926
Oct.	890	211	372	23,040
Nov.	385	48	151	9,090
Dec.	164	15	66	4,066
Total	..	..	..	466,790

Year 1949

Jan.	2790	34	305	18,902
Feb.	1160	48	337	18,854
Mar.	465	64	166	10,320
Apr.	435	34	124	7,440
May	360	64	174	10,836
June	3360	142	1002	60,130
July	9524	187	1147	71,172
Aug.	22800	121	2477	153,558
Sept.	32800	1420	8073	484,384
Oct.	19600	1340	5058	313,616
Nov.	16600	600	2727	163,620
Dec.	2970	391	1145	71,178
Total	..	..	..	1,384,010

Year 1950

Jan.	1230	310	587	36,374
Feb.	1760	213	902	50,526
Mar.	1160	106	261	16,188
Apr.	53500	330	7566	453,986
May	790	190	344	21,354
June	28500	420	8039	482,360
July	69200	2940	15597	967,044
Aug.	22800	2590	7137	442,520
Sept.	2740	1510	1938	116,280
Oct.	44400	2360	14200	880,420
Nov.	67600	2510	21844	1,310,660
Dec.	16420	1050	3008	186,480
Total	..	..	..	4,964,192

Year 1951

Jan.	1690	850	1119	69,352
Feb.	1340	613	874	48,958
Mar.	700	375	489	30,308
Apr.	375	253	292	17,490
May	300	230	263	16,248
June	7450	253	1536	92,182
July	6610	1070	2323	144,010
Aug.	10600	1070	3099	192,140
Sept.	2040	641	954	57,262
Oct.	557	206	375	23,254
Nov.	206	84	125	7,498
Dec.	185	64	118	7,292
Total	..	..	..	705,994

Year 1952

Jan.	124	19	61	3,758
Feb.	227	15	72	4,202
Mar.	1300	104	389	24,098
Apr.	476	144	250	15,020
May	5340	139	888	55,028
June	28800	820	4514	270,858
July	5420	557	1520	94,260
Aug.	16100	820	9919	615,000
Sept.	3930	940	1591	95,438
Oct.	10000	850	2627	162,898
Nov.	1200	84	473	28,380
Dec.	336	134	221	13,728
Total	..	..	..	1,382,718

NAMOI RIVER AT BOGGABRI

Year 1953					Year 1954				
Month	Discharge in cusecs			Discharge for Month Acre Feet	Month	Discharge in cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean			Max.	Min.	Mean	
Jan.	820	84	269	16,658	Jan.	82	11	24	1,492
Feb.	2480	84	454	25,444	Feb.	7260	17	1078	60,350
Mar.	1132	129	300	18,604	Mar.	717	94	236	14,624
Apr.	209	106	136	8,416	Apr.	94	31	71	4,246
May	No Records			46,000*	May	82	31	37	2,278
June	No Records			13,500*	June	No Records			5,000*
July	No Records			26,000*	July	No Records			5,300*
Aug.	No Records			82,000*	Aug.	129	82	97	6,012
Sept.	No Records			58,000*	Sept.	307	24	69	4,132
Oct.	461	209	281	17,450	Oct.	11200	82	1751	108,582
Nov.	290	152	233	13,966	Nov.	No Records			260,000*
Dec.	152	11	62	3,838	Dec.	2220	191	443	27,498
Total	..	..	..	329,876 *	Total	..	..	..	499,514*

Year 1955					Year 1956				
Jan.	2500	100	588	36,458	Jan.	1620	357	531	32,934
Feb.	150000	243	13040	730,000	Feb.	100000	637	9975	578,546
Mar.	46000	656	6518	404,126	Mar.	18000	1260	3828	237,354
Apr.	No Records			30,000*	Apr.	4140	873	1801	108,104
May	No Records			28,000*	May	43500	2780	10429	646,600
June	No Records			59,000*	June	67500	2610	9942	596,520
July	No Records			69,000*	July	28200	3280	11367	704,800
Aug.	No Records			117,000*	Aug.	20600	1810	4846	300,470
Sept.	No Records			73,000*	Sept.	1790	1250	1477	88,640
Oct.	71000	400	9908	614,298	Oct.	7100	1040	1857	115,136
Nov.	No Records			116,000*	Nov.	2150	570	1058	63,464
Dec.	2040	637	995	61,718	Dec.	1130	408	612	37,926
Total	..	..	..	2,338,600*	Total	..	..	..	3,510,494

Year 1957					Year 1958				
Jan.	790	258	413	25,628	Jan.	370	28	85	5,284
Feb.	790	216	330	18,468	Feb.	2080	65	241	13,486
Mar.	645	226	329	20,386	Mar.	83	46	65	4,032
Apr.	790	156	250	14,974	Apr.	46	12	22	1,300
May	280	186	224	13,868	May	215	10	54	3,328
June	302	176	205	12,300	June	119	46	76	4,568
July	445	280	342	21,204	July	665	104	203	12,598
Aug.	1300	226	329	20,414	Aug.	1925	95	397	24,590
Sept.	1085	147	389	23,324	Sept.	4770	348	960	57,594
Oct.	147	55	93	5,790	Oct.	12800	632	2337	144,900
Nov.	60	19	42	2,512	Nov.	577	178	287	17,230
Dec.	104	16	37	2,280	Dec.	5570	119	749	46,438
Total	..	..	..	181,148	Total	..	..	..	335,348

Year 1959					Year 1960				
Jan.	1450	83	526	32,590	Jan.	620	84	279	17,298
Feb.	2780	63	591	33,106	Feb.	178	85	115	6,686
Mar.	4470	376	1024	63,464	Mar.	135	38	83	5,176
Apr.	1045	227	496	29,776	Apr.	194	95	114	6,836
May	218	104	158	9,792	May	210	90	139	8,626
June	275	123	159	9,538	June	100	64	75	4,524
July	1380	208	540	33,504	July	3810	64	601	37,244
Aug.	870	301	476	29,502	Aug.	4670	194	782	48,480
Sept.	980	103	232	13,892	Sept.	2990	140	404	24,262
Oct.	980	103	492	30,534	Oct.	1810	208	418	25,914
Nov.	1840	570	940	56,380	Nov.	6100	43	676	40,540
Dec.	2040	445	892	55,280	Dec.	17000	264	1777	110,178
Total	..	..	..	397,358	Total	..	..	..	335,764

* Estimated

NAMOI RIVER AT BOGGABRI

Year 1961

Month	Discharge in cusecs			Discharge for Month
	Max.	Min.	Mean	Acre Feet
Jan.	780	101	256	15,900
Feb.	208	76	104	5,840
Mar.	500	88	131	8,140
Apr.	150	86	130	7,830
May	150	109	127	7,890
June	650	65	134	8,026
July	122	43	57	3,520
Aug.	1710	65	264	16,340
Sept.	490	38	135	8,120
Oct.	225	28	77	4,790
Nov.	4920	38	817	49,000
Dec.	6800	101	733	45,500
Total	..	..	..	180,896

Year 1962

Month	Discharge in cusecs			Discharge for Month
	Max.	Min.	Mean	Acre Feet
Jan.	54333	222	5137	318,000
Feb.	3280	1300	2013	113,000
Mar.	1650	695	924	57,300
Apr.	820	160	295	17,700
May	725	144	283	17,500
June	600	192	348	20,900
July	855	144	306	19,000
Aug.	2805	210	885	54,900
Sept.	1020	410	655	39,300
Oct.	8250	458	1384	85,800
Nov.	4020	920	1636	98,100
Dec.	1820	250	880	54,600
Total	..	..	..	896,100

Year 1963

Jan.	7950	270	1048	65,000
Feb.	482	225	280	15,700
Mar.	478	166	262	16,300
Apr.	478	119	219	13,200
May	20150	135	4903	304,000
June	22800	1250	5089	305,000
July	2350	1055	1499	93,000
Aug.	6540	1090	1784	111,000
Sept.	7680	1125	2010	121,000
Oct.	1440	855	1093	67,700
Nov.	950	410	584	35,000
Dec.	1300	410	738	45,700
Total	..	..	..	1,192,600

Year 1964

Jan.	59300	386	5933	368,000
Feb.	990	840	887	51,400
Mar.	840	212	484	30,000
Apr.	8550	156	1089	65,000
May	1235	312	830	51,400
June	2840	292	926	55,600
July	11900	500	2587	155,000
Aug.	3580	700	1184	73,400
Sept.	1945	500	872	52,300
Oct.	6540	1130	2059	128,000
Nov.	1130	930	1044	62,700
Dec.	1060	525	610	37,800
Total	..	..	..	1,130,600

Year 1965

Jan.	525	400	434	26,900
Feb.	400	334	361	20,200
Mar.	378	112	252	15,600
Apr.	160	96	117	7,010
May	96	81	88	5,470
June	81	67	81	4,830
July	96	54	79	4,910
Aug.	160	81	140	8,660
Sept.	550	81	249	14,900
Oct.	610	134	454	28,100
Nov.	740	81	476	28,600
Dec.	3000	75	524	32,500
Total	..	..	..	197,680

Year 1966

Jan.	715	425	574	35,600
Feb.	775	525	631	35,400
Mar.	810	66	354	21,900
Apr.	75	58	63	3,790
May.	68	34	54	3,360
June	76	19	43	2,600
July	24	14	18	1,140
Aug.	216	10	50	3,100
Sept.	118	39	61	3,670
Oct.	845	39	143	8,840
Nov.	4940	80	712	42,700
Dec.	600	145	366	22,700
Total	..	..	..	184,800

Year 1967

Jan.	1360	232	535	33,200
Feb.	550	395	499	28,000
Mar.	4980	37	366	22,700
Apr.	55	30	40	2,410
May	105	30	56	3,490
June	55	37	39	2,360
July	65	41	56	3,460
Aug.	225	41	104	6,440
Sept.	330	138	196	11,800
Oct.	625	99	305	18,900
Nov.	262	134	157	9,450
Dec.	500	244	356	22,100
Total	..	..	..	164,310

Year 1968

Jan.	28800	244	1895	117,000
Feb.	1320	506	716	41,500
Mar.	552	53	182	11,300
Apr.	118	53	78	4,700
May	5340	53	556	34,500
June	368	76	141	8,500
July	3270	84	416	25,800
Aug.	9520	162	1979	123,000
Sept.	3060	302	889	53,300
Oct.	2720	186	459	28,500
Nov.	440	132	262	15,700
Dec.	530	110	318	19,700
Total	..	..	..	483,500

NAMOI RIVER AT NARRABRI

LOCATION:	Latitude 30°20' Longitude 149°46'
PERIOD OF ESTABLISHMENT:	January 1892 to date
COMPLETE YEARS OF COMPUTED RECORDS:	52 years
ZERO OF GAUGE:	R.L.670.55 North West Water Conservatio Datum
CATCHMENT AREA:	9,700 Square Miles
CONTROL:	Gravel
EQUIPMENT:	Staff gauge range 0-25 feet
CURRENT METER OBSERVATIONS: (From 23/3/1908 to date)	(a) Number obtained : 346 (b) Maximum observation in cusecs :13,500 (c) Minimum observation in cusecs : 0.5
MAXIMUM ESTIMATED DISCHARGE DURING PERIOD OF RECORDS:	31,500 cusecs
MEAN DAILY DISCHARGE FOR 52 YEARS: (1917-1968) (See Remarks)	408 cusecs
MEAN ANNUAL DISCHARGE FOR 52 YEARS: (1917-1968) (See Remarks)	298,000 acre feet
REMARKS:	Records prior to 1917 are considered unreliable and have not been included. As from March 1960 flows were partly du to controlled releases from Keepit Dam.

NAMOI RIVER AT NARRABRI

Year 1917

Month	Discharge in cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean	
Jan.	4261	240	861	53,376
Feb.	2896	230	797	44,628
Mar.	210	90	145	8,972
Apr.	90	63	73	4,386
May	70	45	49	3,010
June	157	40	92	5,572
July	190	63	101	6,280
Aug.	165	132	147	9,128
Sept.	25690	132	3515	210,880
Oct.	3230	250	993	61,560
Nov.	10078	220	2762	165,744
Dec.	1860	285	855	52,992
Total	..	..	..	626,528

Year 1918

Month	Discharge in cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean	
Jan	5051	250	881	54,628
Feb.	758	123	251	14,054
Mar.	123	70	96	5,944
Apr.	90	50	68	4,082
May	90	63	76	4,692
June	77	45	64	3,836
July	63	40	48	2,974
Aug.	720	63	300	18,626
Sept.	610	140	238	14,308
Oct.	104	77	93	5,782
Nov.	90	45	61	3,706
Dec.	50	14	29	1,792
Total	..	..	..	134,424

Year 1919

Jan.	77	14	22	1,366
Feb.	173	20	39	2,202
Mar.	148	10	52	3,226
Apr.	14	6	9	528
May	20	10	12	762
June	90	10	47	2,840
July	63	25	35	2,210
Aug.	25	17	21	1,290
Sept.	14	14	14	868
Oct.	90	14	33	2,044
Nov.	30	10	19	1,160
Dec.	665	10	134	8,296
Total	..	..	..	26,792

Year 1920

Jan.	855	17	172	10,646
Feb.	485	50	116	6,734
Mar.	45	14	22	1,340
Apr.	10	0	1	38
May	14	0	7	408
June	7924	10	328	19,686
July	15950	455	4361	270,410
Aug.	7000	525	1686	104,540
Sept.	5490	1035	2141	128,450
Oct.	1300	455	712	44,130
Nov.	670	217	352	21,108
Dec.	1905	180	553	34,298
Total	..	..	..	641,788

Year 1921

Jan.	204	65	117	7,248
Feb.	115	58	70	3,934
Mar.	2940	65	469	29,130
Apr.	2820	96	505	30,312
May	870	115	310	19,220
June	5830	870	2551	153,050
July	2520	760	1416	87,790
Aug.	13750	1240	4239	262,804
Sept.	1905	475	781	46,850
Oct.	5600	670	2099	130,120
Nov.	1700	420	778	46,700
Dec.	6320	204	1006	62,380
Total	..	..	..	879,538

Year 1922

Jan.	3790	368	1371	85,006
Feb.	435	169	288	16,134
Mar.	870	115	299	18,566
Apr.	180	115	152	9,140
May	115	96	105	6,512
June	204	96	123	7,350
July	1420	115	314	19,460
Aug.	1125	260	551	34,174
Sept.	455	217	309	18,520
Oct.	325	180	218	13,516
Nov.	260	96	140	8,420
Dec.	1550	115	492	30,506
Total	..	..	..	267,304

Year 1923

Jan.	125	80	105	6,532
Feb.	80	72	78	4,352
Mar.	72	65	69	4,254
Apr.	72	65	66	3,928
May	65	65	65	4,030
June	115	65	75	4,506
July	1360	278	769	47,706
Aug.	780	260	424	26,314
Sept.	3750	165	1034	62,034
Oct.	283	165	188	11,682
Nov.	362	140	215	12,910
Dec.	500	37	96	5,946
Total	..	..	..	194,194

Year 1924

Jan.	835	108	349	21,780
Feb.	3650	250	1234	71,594
Mar.	301	80	203	12,584
Apr.	383	80	242	14,530
May	362	177	224	13,894
June	710	165	329	19,784
July	1640	301	880	54,604
Aug.	1193	383	602	37,368
Sept.	2360	655	954	57,248
Oct.	2440	740	1297	80,422
Nov.	10650	682	2967	178,038
Dec.	1360	320	660	40,944
Total	..	..	..	602,790

NAMOI RIVER AT NARRABRI

Year 1925					Year 1926				
Month	Discharge in cusecs			Discharge for Month Acre Feet	Month	Discharge in cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean			Max.	Min.	Mean	
Jan.	682	98	238	14,790	Jan.	1940	108	541	33,538
Feb.	165	98	134	6,972	Feb.	118	17	58	3,258
Mar.	118	80	99	6,124	Mar.	2060	13	167	10,388
Apr.	89	72	82	4,952	Apr.	362	17	96	5,796
May	98	64	78	4,874	May	1550	50	558	34,602
June	108	89	95	5,686	June	960	165	532	31,954
July	250	80	127	7,898	July	835	108	374	23,210
Aug.	550	140	243	15,104	Aug.	320	233	268	16,654
Sept.	525	233	386	23,190	Sept.	233	217	224	13,870
Oct.	233	31	143	8,862	Oct.	320	98	180	11,208
Nov.	1835	89	461	27,670	Nov.	98	37	71	4,268
Dec.	165	25	84	5,246	Dec.	1700	31	129	8,034
Total	..	..	..	131,368	Total	..	..	..	196,780

Year 1927					Year 1928				
Jan.	1970	31	585	36,266	Jan.	152	43	70	4,320
Feb.	1480	72	454	25,418	Feb.	7620	80	1974	114,514
Mar.	129	17	48	2,960	Mar.	4180	89	806	49,952
Apr.	50	25	33	2,032	Apr.	5710	283	1235	74,136
May	98	25	48	2,958	May	266	80	135	8,370
June	37	31	35	2,112	June	5150	64	1526	91,566
July	31	25	26	1,622	July	6600	835	2053	127,274
Aug.	25	21	24	1,470	Aug.	2130	283	882	54,710
Sept.	21	17	19	1,124	Sept.	283	98	162	9,706
Oct.	17	17	17	1,054	Oct.	98	89	93	5,770
Nov.	17	17	17	1,020	Nov.	89	50	68	4,056
Dec.	2030	17	368	22,802	Dec.	43	17	27	1,698
Total	..	..	..	100,838	Total	..	..	..	546,072

Year 1929					Year 1930				
Jan.	17	7	11	706	Jan.	266	10	43	2,654
Feb.	2700	7	773	43,300	Feb.	64	13	23	1,284
Mar.	362	98	191	11,862	Mar.	72	31	45	2,706
Apr.	960	64	391	23,476	Apr.	895	10	128	7,940
May	217	108	171	10,586	May	31	21	25	1,574
June	129	108	114	6,830	June	4030	21	683	41,000
July	129	98	106	6,600	July	3790	233	902	55,916
Aug.	1160	165	578	35,822	Aug.	740	233	444	27,554
Sept.	3200	428	816	48,990	Sept.	575	140	226	13,556
Oct.	1550	428	730	45,212	Oct.	2660	118	614	38,058
Nov.	575	140	321	19,244	Nov.	600	64	234	14,042
Dec.	266	31	87	5,372	Dec.	152	31	64	3,980
Total	..	..	..	258,000	Total	..	..	..	210,264

Year 1931					Year 1932				
Jan.	43	7	21	1,320	Jan.	279	72	137	8,490
Feb.	43	2	14	754	Feb.	72	19	42	2,444
Mar.	2160	0	365	22,652	Mar.	15	8	12	718
Apr.	1670	89	572	34,306	Apr.	72	8	40	2,428
May	2130	89	900	55,800	May	72	40	53	3,278
June	12890	1020	2946	176,734	June	60	40	51	3,066
July	9070	1110	3020	187,260	July	520	49	212	13,142
Aug.	1020	478	778	48,236	Aug.	172	111	134	8,334
Sept	500	242	388	23,308	Sept.	2060	97	630	37,776
Oct.	436	140	251	5,554	Oct.	2240	274	740	45,894
Nov.	356	125	211	12,658	Nov.	590	143	296	17,760
Dec.	4190	125	997	61,844	Dec.	410	59	173	10,714
Total	..	..	..	630,426	Total	..	..	..	154,044

NAMOI RIVER AT NARRABRI

Year 1933					Year 1934				
Month	Discharge in cusecs			Discharge for Month Acre Feet	Month	Discharge in cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean			Max.	Min.	Mean	
Jan.	3400	59	648	40,168	Jan.	870	140	360	22,294
Feb.	1950	69	414	23,210	Feb.	4880	540	1802	100,920
Mar.	69	8	27	1,650	Mar.	1820	210	525	32,572
Apr.	26	6	15	924	Apr.	600	153	269	16,154
May	15	8	10	644	May	300	220	249	15,420
June	330	6	43	2,600	June	250	205	212	12,750
July	2400	143	814	50,472	July	530	220	331	20,530
Aug.	2440	292	804	49,838	Aug.	3070	415	1155	71,590
Sept.	1440	204	460	27,580	Sept.	8920	700	2190	131,380
Oct.	11480	68	1970	122,150	Oct.	4510	550	1559	96,640
Nov.	3890	910	1768	106,080	Nov.	1500	430	756	45,350
Dec.	2580	500	1002	62,100	Dec.	1060	400	644	39,900
Total	..	..	..	487,416	Total	..	..	..	605,500

Year 1935					Year 1936				
Jan.	5000	600	1702	105,540	Jan.	322	30	90	5,594
Feb.	720	234	417	23,346	Feb.	480	51	125	7,268
Mar.	234	146	169	10,480	Mar.	1150	98	364	22,554
Apr.	133	68	95	5,696	Apr.	268	159	206	12,334
May	121	68	106	6,580	May	218	146	171	10,286
June	109	98	106	6,364	June	218	146	180	10,796
July	218	98	158	9,788	July	1710	173	752	46,626
Aug.	218	121	155	9,592	Aug.	4290	238	1047	64,910
Sept.	400	109	189	11,370	Sept.	1750	222	487	29,242
Oct.	1300	146	461	28,592	Oct.	222	79	135	8,350
Nov.	420	59	145	8,688	Nov.	79	38	57	3,422
Dec.	173	36	81	5,004	Dec.	306	16	75	4,640
Total	..	..	..	231,040	Total	..	..	..	226,022

Year 1937					Year 1938				
Jan.	238	89	135	8,386	Jan.	100	5	39	2,402
Feb.	177	69	105	5,860	Feb.	1010	84	306	17,140
Mar.	1790	31	255	15,790	Mar.	84	5	23	1,454
Apr.	136	52	63	3,798	Apr.	43	3	7	400
May	60	45	54	3,340	May	530	22	73	4,506
June	306	60	133	8,002	June	220	62	122	7,304
July	575	124	212	13,114	July	185	96	120	7,462
Aug.	2210	163	481	29,826	Aug.	3070	137	966	59,916
Sept.	1790	207	519	31,170	Sept.	835	185	290	17,406
Oct.	820	163	278	17,262	Oct.	530	109	188	11,674
Nov.	1035	112	381	22,836	Nov.	465	152	250	15,046
Dec.	770	31	150	9,298	Dec.	690	22	152	9,416
Total	..	..	..	168,682	Total	..	..	..	154,126

Year 1939					Year 1940				
Jan.	530	2	49	3,056	Jan.	202	0	92	5,704
Feb.	96	3	29	1,618	Feb.	28	5	14	854
Mar.	3450	0	404	25,030	Mar.	1085	12	160	9,604
Apr.	380	28	117	7,020	Apr.	84	22	34	2,082
May	96	35	53	3,278	May	52	17	22	1,318
June	62	22	33	2,002	June	28	8	18	1,142
July	505	28	179	10,720	July	52	8	25	1,534
Aug.	885	137	377	23,364	Aug.	12	0	2	98
Sept.	400	62	153	9,186	Sept.	1600	0	177	10,256
Oct.	73	22	39	2,442	Oct.	0	0	0	0
Nov.	338	28	101	6,074	Nov.	17	0	7	416
Dec.	600	96	245	15,216	Dec.	3200	3	568	35,232
Total	..	..	..	109,006	Total	..	..	..	68,240

NAMOI RIVER AT NARRABRI

Year 1941					Year 1942				
Month	Discharge in cusecs			Discharge for Month Acre Feet	Month	Discharge in cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean			Max.	Min.	Mean	
Jan.	11050	98	2333	144,626	Jan.	24	4	13	778
Feb.	3070	187	705	39,482	Feb.	380	4	102	5,694
Mar.	5830	36	1470	91,146	Mar.	500	7	80	4,982
Apr.	322	87	191	11,474	Apr.	380	10	94	5,660
May	87	51	67	4,138	May	17	12	16	1,004*
June	1910	68	620	37,218	June	24	17	23	1,398*
July	400	187	261	16,156	July	445	121	231	14,302*
Aug.	218	68	134	8,284	Aug.	12420	51	1984	123,016
Sept.	218	36	99	5,932	Sept.	136	80	96	5,788
Oct.	740	30	159	9,870	Oct.	2780	67	767	47,552
Nov.	380	30	138	8,286	Nov.	2620	199	551	33,088
Dec.	51	19	35	2,194	Dec.	760	80	157	9,764
Total	..	..	..	378,806	Total	..	..	..	253,026

Year 1943					Year 1944				
Jan.	3640	319	939	58,226	Jan	1070	125	421	26,118
Feb.	425	60	153	8,560	Feb.	505	52	166	9,640
Mar.	54	18	33	2,048	Mar.	45	15	27	1,684
Apr.	54	18	30	1,788	Apr.	33	15	18	1,102
May	67	24	35	2,142	May	530	15	62	3,836
June	151	67	98	5,902	June	192	45	63	3,794
July	107	67	84	5,198	July	860	39	245	15,196
Aug.	490	93	218	13,522	Aug.	4450	121	766	47,504
Sept.	445	151	248	14,886	Sept.	1040	125	273	16,388
Oct.	1580	177	374	23,174	Oct.	137	29	74	4,576
Nov.	980	93	259	15,528	Nov.	29	13	22	1,290
Dec.	350	67	132	8,198	Dec.	13	6	8	502
Total	..	..	..	159,172	Total	..	..	..	131,630

Year 1945					Year 1946				
Jan.	141	6	23	1,410*	Jan.	1000	13	121	7,526*
Feb.	1110	42	202	11,318*	Feb.	65	7	20	1,132*
Mar.	795	25	149	9,208*	Mar.	25	4	7	434*
Apr.	30	19	24	1,410	Apr.	13	2	4	260*
May	201	15	60	3,728	May	24	9	15	942
June	4000	48	660	39,626*	June	10	7	7	426*
July	1580	235	518	32,128*	July	28	7	21	1,286*
Aug.	795	190	362	22,440*	Aug.	7	4	6	356*
Sept.	2130	182	487	29,244	Sept.	4	3	3	186*
Oct.	150	79	113	7,014*	Oct.	32	2	10	635
Nov.	176	42	83	4,990*	Nov.	345	0.5	37	2,208
Dec.	107	42	68	4,206*	Dec.	1030	7	70	4,362*
Total	..	..	..	166,722	Total	..	..	..	19,753

Year 1947					Year 1948				
Jan.	1030	16	52	3,232*	Jan.	4190	146	885	54,886
Feb.	6180	107	1037	58,050*	Feb.	139	28	56	3,234
Mar.	2660	4	453	28,116*	Mar.	1940	52	223	13,818
Apr.	17	0	4	266*	Apr.	45	31	39	2,336
May	37	12	20	1,246*	May	131	38	69	4,250
June	30	8	14	858*	June	1460	38	418	25,100
July	37	12	16	1,012*	July	579	176	318	19,728
Aug.	430	17	71	4,412*	Aug.	2610	84	315	19,538
Sept.	1710	78	422	25,346*	Sept.	1630	131	366	21,944
Oct.	1580	60	340	21,052*	Oct.	530	35	155	9,588
Nov.	372	88	176	10,534*	Nov.	164	14	53	3,184
Dec.	3600	266	1848	114,590*	Dec.	164	9	27	1,672
Total	..	..	..	268,714	Total	..	..	..	179,278

* Namoi at Karuah Figures Adopted.

NAMOI RIVER AT NARRABRI

Year 1949					Year 1950				
Month	Discharge in cusecs			Discharge for Month Acre Feet	Month	Discharge in cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean			Max.	Min.	Mean	
Jan.	881	38	168	10,432	Jan.	852	111	268	16,594
Feb.	485	9	172	9,648	Feb.	1760	111	521	29,172
Mar.	275	25	83	5,176	Mar.	189	45	94	5,798
Apr.	152	14	37	2,216	Apr.	9800	176	2332	139,890*
May	131	31	62	3,858	May	306	121	171	10,584
June	1830	60	471	28,250	June	6840	216	2048	122,904
July	3300	111	470	29,150	July	14800	1280	5366	332,680*
Aug.	6080	152	808	50,118	Aug.	8100	1060	2574	159,560*
Sept.	9800	710	3056	183,380*	Sept.	1460	579	763	45,774
Oct.	5950	852	2131	132,138	Oct.	10800	880	3669	227,500*
Nov.	4310	290	945	56,716	Nov.	15400	1260	5292	317,500
Dec.	1530	245	493	30,590	Dec.	6780	444	1471	91,192
Total	..	..	..	541,672	Total	..	..	..	1,499,148

Year 1951					Year 1952				
Jan.	936	390	509	31,586	Jan.	52	14	29	1,768
Feb.	630	230	395	22,100	Feb.	339	9	51	2,944
Mar.	390	164	213	13,236	Mar.	852	45	184	11,388
Apr.	176	131	149	8,958	Apr.	245	68	100	5,972
May	152	111	131	8,146	May	2070	60	368	22,796
June	2730	121	597	35,812	June	5490	245	1556	93,342
July	2820	390	1004	62,242	July	1690	369	665	41,236
Aug.	3600	464	1227	76,084	Aug.	12600	474	2790	173,000
Sept.	992	230	452	27,136	Sept.	1150	403	668	40,056
Oct.	407	102	182	11,290	Oct.	3490	353	931	57,692
Nov.	102	38	65	3,878	Nov.	587	131	256	15,334
Dec.	45	25	33	2,060	Dec.	141	68	105	6,504
Total	..	..	..	302,528	Total	..	..	..	472,032

Year 1953					Year 1954				
Jan.	230	68	127	7,870	Jan.	63	19	33	2,048
Feb.	1010	52	174	9,746	Feb.	1760	27	354	19,834
Mar.	584	84	161	10,012	Mar.	320	19	72	4,490
Apr.	93	68	79	4,752	Apr.	23	11	18	1,052
May	627	84	328	20,366	May	23	15	17	1,070
June	189	102	133	8,002	June	63	19	39	2,358
July	530	93	192	11,938	July	59	29	37	2,306
Aug.	1320	121	495	30,662	Aug.	50	34	40	2,490
Sept.	1380	145	391	23,432	Sept.	47	16	34	2,020
Oct.	181	113	135	8,350	Oct.	2990	12	680	42,138
Nov.	157	63	99	5,938	Nov.	4600	252	1234	74,056
Dec.	63	19	36	2,254	Dec.	220	83	145	8,992
Total	..	..	..	143,322	Total	..	..	..	162,854

Year 1955					Year 1956				
Jan.	1970	40	286	17,714	Jan.	477	50	134	8,300
Feb.	31500	40	2570	144,000	Feb.	18000	167	3980	231,000
Mar.	27000	184	3740	232,000	Mar.	3780	538	1457	90,312
Apr.	167	22	69	4,128	Apr.	1690	294	663	39,784
May	106	6	33	2,046	May	6880	622	2955	183,204
June	1690	4	234	14,044	June	8980	955	2580	154,794
July	978	69	376	23,290	July	5530	1030	2874	178,180
Aug.	2000	294	776	48,106	Aug.	3740	502	1234	76,528
Sept.	1280	235	621	37,280	Sept.	502	340	418	25,072
Oct.	11500	120	2080	129,000	Oct.	1760	242	538	33,370
Nov.	4660	122	804	48,224	Nov.	798	116	303	18,158
Dec.	902	0	122	7,564	Dec.	355	92	171	10,584
Total	..	..	..	707,396	Total	..	..	..	1,049,286

* Namoi at Karuah Figures Adopted.

NAMOI RIVER AT NARRABRI

Year 1957

Month	Discharge in cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean	
Jan.	269	29	108	6,722
Feb.	152	22	52	2,916
Mar.	190	15	56	3,462
Apr.	190	3	30	1,816
May	22	0.7	12	738
June	140	0.7	66	3,944
July	190	128	147	9,118
Aug.	451	116	138	8,564
Sept.	434	80	195	11,682
Oct.	80	15	39	2,416
Nov.	15	6	11	686
Dec.	22	0.7	10	608
Total	..	..	..	52,672

Year 1958

Month	Discharge in cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean	
Jan.	78	8	27	1,694
Feb.	468	31	111	6,228
Mar.	66	20	23	1,404
Apr.	20	20	20	1,200
May	111	20	33	2,040
June	32	22	24	1,430
July	278	32	126	7,814
Aug.	535	69	139	8,638
Sept.	1450	107	365	21,892
Oct.	3420	185	887	54,994
Nov.	208	32	91	5,444
Dec.	1535	12	174	10,784
Total	..	..	..	123,562

Year 1959

Jan.	795	50	248	15,360
Feb.	1000	39	269	15,048
Mar.	1340	140	395	24,496
Apr.	395	56	182	10,936
May	98	50	66	4,096
June	62	28	36	2,176
July	495	28	176	10,890
Aug.	320	106	170	10,542
Sept.	236	36	83	5,170
Oct.	212	69	137	8,518
Nov.	475	117	230	13,796
Dec.	1010	117	330	20,474
Total	..	..	..	141,502

Year 1960

Jan.	200	44	102	6,300
Feb.	69	28	37	2,138
Mar.	52	17	28	1,734
Apr.	78	28	35	2,094
May	61	22	36	2,252
June	28	22	23	1,404
July	1180	22	230	14,242
Aug.	1480	71	281	17,452
Sept.	915	42	124	7,426
Oct.	270	16	53	3,280
Nov.	1900	16	241	14,442
Dec.	3140	37	492	30,498
Total	..	..	..	103,262

Year 1961

Jan.	142	46	86	5,334
Feb.	46	32	37	2,096
Mar.	140	27	46	2,850
Apr.	57	22	35	2,078
May	38	32	34	2,128
June	70	32	36	2,134
July	45	22	24	1,476
Aug.	510	22	86	5,308
Sept.	190	17	51	3,032
Oct.	94	11	23	1,416
Nov.	1210	11	190	11,428
Dec.	1960	80	579	35,920
Total	..	..	..	75,200

Year 1962

Jan.	9140	115	1449	89,810
Feb.	865	380	552	30,918
Mar.	430	245	303	18,782
Apr.	245	33	95	5,710
May	231	22	73	4,550
June	215	43	82	4,950
July	245	22	67	4,130
Aug.	840	33	265	16,500
Sept.	350	63	216	13,000
Oct.	2170	112	382	23,700
Nov.	1420	254	486	29,200
Dec.	536	60	295	18,300
Total	..	..	..	259,550

Year 1963

Jan.	1180	34	245	15,200
Feb.	68	7	24	1,350
Mar.	227	2	39	2,420
Apr.	325	7	37	2,200
May	3460	7	942	58,400
June	4150	295	1180	70,800
July	661	254	355	22,000
Aug.	1450	228	397	24,600
Sept.	2320	228	597	35,800
Oct.	340	177	223	13,800
Nov.	177	34	93	5,600
Dec.	370	34	194	12,000
Total	..	..	..	264,170

Year 1964

Jan.	14190	56	1710	106,000
Feb.	143	60	86	5,000
Mar.	261	1	40	2,470
Apr.	2170	1	202	12,100
May	180	5	78	4,860
June	410	3	114	6,840
July	2000	28	579	35,900
Aug.	610	37	184	11,400
Sept.	310	3	94	5,650
Oct.	1810	99	431	26,700
Nov.	222	88	112	6,710
Dec.	110	1	32	1,980
Total	..	..	..	225,610

NAMOI RIVER AT NARRABRI

Year 1965					Year 1966				
Month	Discharge in cusecs			Discharge for Month Acre Feet	Month	Discharge in cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean			Max.	Min.	Mean	
Jan.	28	3	11	684	Jan.	98	65	81	5,040
Feb.	28	12	15	856	Feb.	98	73	83	4,630
Mar.	19	1	11	660	Mar.	85	4	42	2,620
Apr.	12	1	5	318	Apr.	32	0	19	1,160
May	7	3	6	392	May	38	16	32	1,960
June	6	3	3	204	June	52	13	30	1,780
July	6	3	5	295	July	16	13	15	908
Aug.	19	6	18	1,130	Aug.	66	10	16	972
Sept.	80	19	33	1,990	Sept.	30	0	13	779
Oct.	95	60	74	4,590	Oct.	80	2	20	1,230
Nov.	65	12	38	2,260	Nov.	1030	0	112	6,740
Dec.	480	16	112	6,970	Dec.	74	24	42	2,590
Total	..	..	..	20,349	Total	..	..	..	30,409

Year 1967					Year 1968				
Jan.	No Records			4,600*	Jan.	4550	20	571	35,400
Feb.	60	45	56	3,120	Feb.	245	66	127	7,390
Mar.	1180	0	87	5,410	Mar.	95	0	28	1,730
Apr.	10	0	5	322	Apr.	10	0	3.5	207
May	16	0	8	512	May	790	0.5	117	7,250
June	16	7	8	504	June	38	4	13.3	800
July	20	2	7	408	July	447	2	64	3,980
Aug.	24	0	7	442	Aug.	2100	14	408	25,300
Sept.	115	13	25	1,480	Sept.	575	32	182	10,900
Oct.	66	7	33	2,070	Oct.	372	27	80	4,990
Nov.	20	7	13	772	Nov.	37	2.5	19.3	1,160
Dec.	57	20	37	2,300	Dec.	75	3.7	27	1,700
Total	..	..	..	21,940*	Total	..	..	..	100,807

* Estimated

NARRABRI CREEK AT NARRABRI

LOCATION:	Latitude 30°20' Longitude 149°47'
PERIOD OF ESTABLISHMENT:	December 1911 to date
COMPLETE YEARS OF COMPUTED RECORDS:	52 years
ZERO OF GAUGE:	R.L.669.91 North West Water Conservation Datum
CATCHMENT AREA:	Ana branch of Namoi River
CONTROL:	Gravel
EQUIPMENT:	Staff gauge, range 0-35 feet
CURRENT METER OBSERVATIONS:	(a) Number obtained : 389
	(b) Maximum observation in cusecs : 25,600
	(c) Minimum observation in cusecs : 0
MAXIMUM ESTIMATED DISCHARGE DURING PERIOD OF RECORDS:	80,000 cusecs
MEAN DAILY DISCHARGE FOR 52 YEARS: (1917 - 1968) (See Remarks)	515 cusecs
MEAN ANNUAL DISCHARGE FOR 52 YEARS: (1917-1968) (See Remarks)	376,000 acre feet
REMARKS:	Records prior to 1917 are considered unreliable and have not been included.
	Narrabri Creek at Karuah replaced this station from 31st August 1941 to 23rd May 1960.
	Records have therefore been estimated from Narrabri Creek at Karuah discharges between 31st August 1941 and 23rd May 1960.
	Gauge zero from establishment to 31st August 1941 was R.L.674.91 North West Water Conservation Datum.
	As from March 1960 flows are due in part to controlled releases from Keepit Dam.

NARRABRI CREEK AT NARRABRI

Year 1917					Year 1918				
Month	Discharge in cusecs			Discharge for Month Acre Feet	Month	Discharge in cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean			Max.	Min.	Mean	
Jan.	3100	54	464	28,760	Jan.	4220	21	3945	24,462
Feb.	820	54	175	9,808	Feb.	160	74	112	6,292
Mar.	54	17	23	1,414	Mar.	130	54	81	5,044
Apr.	17	11	14	828	Apr.	54	21	32	1,988
May	11	8	10	592	May	21	17	19	1,166
June	8	6	7	416	June	17	14	15	894
July	160	6	45	2,814	July	11	2	6	386
Aug.	160	26	80	4,992	Aug.	220	2	138	8,548
Sept	18750	11	1895	113,688	Sept.	220	26	89	5,364
Oct.	1080	42	417	25,876	Oct.	21	11	15	934
Nov.	17190	11	2314	138,846	Nov.	11	2	4	266
Dec.	640	54	239	14,844	Dec.	2	1	2	114
Total	..	..	..	342,878	Total	..	..	..	55,458

Year 1919					Year 1920				
Jan.	3	0	1	76	Jan.	770	2	52	3,246
Feb.	6	0	2	108	Feb.	2	0	0.5	28
Mar.	6	1	3	162	Mar.	2	0	0.5	30
Apr.	1	0	0.5	32	Apr.	0	0	0	0
May	2	0	2	106	May	0	0	0	0
June	2	2	2	120	June	1500	1	51	3,068
July	4	2	3	178	July	49300	15	8494	526,644
Aug.	3	3	3	186	Aug.	10830	15	848	52,608
Sept.	3	2	2	138	Sept.	10830	25	1169	70,122
Oct.	2	2	2	124	Oct.	160	9	45	2,828
Nov.	2	1	2	92	Nov.	9	4	8	458
Dec.	54	0	14	892	Dec.	226	4	20	1,232
Total	..	..	..	2,214	Total	..	..	..	660,264

Year 1921					Year 1922				
Jan.	4	0	2	98	Jan.	5210	11	641	39,720
Feb.	0	0	0	0	Feb.	46	5	19	1,080
Mar.	2360	0	174	10,792	Mar.	11	5	7	442
Apr.	480	0	85	5,122	Apr.	5	3	4	260
May	177	0	13	802	May	5	3	4	254
June	7260	177	2032	121,908	June	5	5	5	300
July	31260	390	6288	389,838	July	186	5	28	1,740
Aug.	527	125	278	17,264	Aug.	186	11	90	5,564
Sept.	457	94	157	9,414	Sept.	11	8	10	594
Oct.	6830	104	983	60,950	Oct.	8	8	8	496
Nov.	457	38	133	8,076	Nov.	5	2	4	236
Dec.	7410	3	749	46,440	Dec.	390	1	72	4,450
Total	..	..	..	670,704	Total	..	..	..	55,136

Year 1923					Year 1924				
Jan.	5	3	4	230	Jan.	84	1	29	1,828
Feb.	2	0	2	72	Feb.	2910	8	460	26,710
Mar.	0	0	0	0	Mar.	160	3	52	3,262
Apr.	0	0	0	0	Apr.	3	0	2	82
May	0	0	0	0	May	0	0	0	0
June	0	0	0	0	June	74	0	12	758
July	277	11	113	6,992	July	277	16	110	6,840
Aug.	114	5	33	2,060	Aug.	527	16	99	6,152
Sept.	2820	3	369	22,154	Sept.	1000	74	262	15,738
Oct.	30	1	7	430	Oct.	890	55	395	24,498
Nov.	0	0	0	0	Nov.	18750	433	2844	170,658
Dec.	11	0	2	100	Dec.	551	90	213	13,220
Total	..	..	..	32,038	Total	..	..	..	269,746

NARRABRI CREEK AT NARRABRI

Year 1925

Month	Discharge in cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean	
Jan.	90	0	12	770
Feb.	12	1	4	236
Mar.	1	0	0	12
Apr.	0	0	0	0
May	0	0	0	0
June	0	0	0	0
July	12	3	9	540
Aug.	37	3	17	1,058
Sept.	37	6	18	1,088
Oct.	6	0	2	122
Nov.	577	0	93	5,604
Dec.	12	1	5	342
Total	..	..	..	9,772

Year 1926

Month	Discharge in cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean	
Jan	1170	6	319	19,802
Feb.	18	1	5	260
Mar.	1385	0	74	4,602
Apr.	160	1	18	1,088
May	390	0	153	9,498
June	186	2	63	3,804
July	148	1	53	3,274
Aug.	30	3	15	916
Sept.	3	2	2	156
Oct.	101	0	15	956
Nov.	0	0	0	0
Dec.	890	148	33	2,076
Total	..	..	..	46,432

Year 1927

Jan.	687	0	123	7,618
Feb.	604	0	174	9,740
Mar.	24	0	5	302
Apr.	3	1	2	130
May	3	1	2	116
June	2	1	2	102
July	1	1	1	62
Aug.	2	1	1	86
Sept.	1	1	1	60
Oct.	1	1	1	62
Nov.	1	1	1	60
Dec.	4950	3	542	33,588
Total	..	..	..	51,926

Year 1928

Jan.	2	1	1	86
Feb.	10830	1	1887	109,458
Mar.	7120	6	715	4,434
Apr.	3790	167	652	39,132
May	167	79	111	6,866
June	9690	51	1571	94,266
July	10830	180	1658	102,780
Aug.	1170	72	271	16,788
Sept.	65	0	13	788
Oct.	0	0	0	0
Nov.	0	0	0	0
Dec.	0	0	0	0
Total	..	..	..	374,598

Year 1929

Jan.	0	0	0	0
Feb.	2190	0	420	23,502
Mar.	72	4	26	1,602
Apr.	58	1	12	704
May	2	0	0.4	26
June	0	0	0	0
July	0	0	0	0
Aug.	1940	0	348	21,572
Sept.	2270	6	192	11,548
Oct.	760	23	156	9,684
Nov.	37	0	9	520
Dec.	1	0	0.1	6
Total	..	..	..	69,164

Year 1930

Jan.	12	0	0.8	50
Feb.	1	0	0	2
Mar.	126	0	9	558
Apr.	0	0	0	0
May	0	0	0	0
June	4110	0	435	26,106
July	2450	9	290	17,998
Aug.	72	6	25	1,560
Sept.	58	6	12	716
Oct.	1800	4	138	8,566
Nov.	58	0	12	708
Dec.	3	0	0.4	24
Total	..	..	..	56,288

Year 1931

Jan.	0	0	0	0
Feb.	0	0	0	0
Mar.	850	0	79	4,900
Apr.	580	1	59	3,514
May	4220	2	302	18,742
June	21900	100	2984	179,074
July	16270	145	2661	164,996
Aug.	214	68	141	8,724
Sept.	68	18	47	2,822
Oct.	18	0	10	612
Nov.	35	0	9	536
Dec.	4950	2	542	33,594
Total	..	..	..	417,514

Year 1932

Jan.	26	0	3	200
Feb.	0	0	0	0
Mar.	0	0	0	0
Apr.	6	0	3	184
May	6	0	3	156
June	2	0	1	84
July	2	0	1	76
Aug.	0	0	0	0
Sept.	1020	0	258	15,486
Oct.	1020	14	243	15,058
Nov.	80	0	19	1,146
Dec.	35	0	6	364
Total	..	..	..	32,754

NARRABRI CREEK AT NARRABRI

Year 1933					Year 1934				
Month	Discharge in cusecs			Discharge for Month Acre Feet	Month	Discharge in cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean			Max.	Min.	Mean	
Jan.	3720	0	505	31,080	Jan.	249	7	47	2,940
Feb.	1480	10	153	8,550	Feb.	6980	68	1558	87,250
Mar.	10	7	9	584	Mar.	1480	7	145	8,994
Apr.	10	7	8	492	Apr.	59	7	13	756
May	4	0	0.2	14	May	10	7	8	488
June	51	0	4	276	June	10	7	9	540
July	1660	10	354	21,932	July	51	10	15	944
Aug.	1850	43	330	20,444	Aug.	2950	14	459	28,440
Sept.	770	24	159	9,534	Sept.	17500	195	2484	149,040
Oct.	6850	480	1961	121,560	Oct.	6430	59	1285	79,700
Nov.	4950	268	1261	75,652	Nov.	1480	68	288	17,290
Dec.	1720	78	349	21,614	Dec.	540	51	183	11,350
Total	..	..	..	311,732	Total	..	..	..	387,732

Year 1935					Year 1936				
Jan.	8850	150	1610	99,806	Jan.	51	2	7	442
Feb.	212	24	84	4,730	Feb.	123	2	14	830
Mar.	24	4	9	580	Mar.	730	2	113	7,002
Apr.	2	0	0.7	40	Apr.	30	14	18	1,110
May	0	0	0	0	May	19	2	8	524
June	0	0	0	0	June	2	2	2	120
July	14	4	5	318	July	1310	2	260	16,110
Aug.	14	4	6	348	Aug.	5440	78	787	48,782
Sept.	78	2	14	830	Sept.	1150	59	209	12,522
Oct.	690	4	140	8,670	Oct.	59	4	25	1,560
Nov.	43	2	8	486	Nov.	7	2	3	196
Dec.	4	2	3	188	Dec.	72	0	11	678*
Total	..	..	..	115,996	Total	..	..	..	89,876

Year 1937					Year 1938				
Jan.	46	8	21	1,296	Jan.	10	0	0.6	40
Feb.	20	2	9	488	Feb.	490	0	80	4,484
Mar.	670	0	78	4,870	Mar.	0	0	0	0
Apr.	20	0.5	3	206	Apr.	0	0	0	0
May	0.5	0	0.1	9	May	249	0	18	1,112
June	63	0	18	1,085	June	20	0	6	352
July	260	8	43	2,650	July	6	0	1	80
Aug.	1870	12	243	15,088	Aug.	3540	12	513	31,812
Sept.	1190	37	286	17,156	Sept.	420	12	81	4,860
Oct.	345	19	64	3,944	Oct	173	10	31	1,834
Nov.	400	5	107	6,412	Nov.	67	6	27	1,651
Dec.	445	0.2	35	2,166	Dec.	90	0	13	786
Total	..	..	..	55,370	Total	..	..	..	47,011

Year 1939					Year 1940				
Jan.	114	0	11	670	Jan.	0	0	0	0
Feb.	18	0	2	108	Feb.	770	0	63	3,670
Mar.	2300	0	192	11,908	Mar.	0	0	0	0
Apr.	125	2	28	1,692	Apr.	590	0	37	2,198
May	2	0	0.6	36	May	0	0	0	0
June	0	0	0	0	June	0	0	0	0
July	81	0	29	1,799	July	0	0	0	0
Aug.	260	16	105	6,534	Aug.	0	0	0	0
Sept.	116	8	31	1,844	Sept.	0	0	0	0
Oct.	28	0	8	496	Oct.	0	0	0	0
Nov.	48	2	20	1,210	Nov.	0	0	0	0
Dec.	125	0	24	1,504	Dec.	4420	10	315	19,536
Total	..	..	..	27,801	Total	..	..	..	25,404

* Note: From December 1936 to June 1960 Narrabri Creek at Karuah Figures adopte

NARRABRI CREEK AT NARRABRI

Year 1941					Year 1942				
Month	Discharge in cusecs			Discharge for Month Acre Feet	Month	Discharge in cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean			Max.	Min.	Mean	
Jan.	24200	144	3468	214,986	Jan.	6	0	1	88
Feb.	3870	60	463	25,926	Feb.	134	0	37	2,090
Mar.	17600	34	2556	158,500	Mar.	245	0	28	1,767
Apr.	275	65	125	7,516	Apr.	178	4	36	2,190
May	75	52	56	3,500	May	3	0	1	64
June	1250	75	366	21,986	June	4	0	3	204
July	216	116	142	8,790	July	29000	6	3032	188,000
Aug.	125	56	77	4,800	Aug.	325	108	204	12,676
Sept.	116	34	60	3,590	Sept.	125	81	106	6,334
Oct.	325	34	74	4,570	Oct.	4420	81	702	43,550
Nov.	134	31	75	4,544	Nov.	2300	190	427	25,650
Dec.	44	6	17	1,082	Dec.	445	75	132	8,200
Total	..	..	..	459,790	Total	..	..	..	290,813

Year 1943					Year 1944				
Jan.	3430	305	692	42,920	Jan.	810	120	374	23,160
Feb.	345	22	102	5,728	Feb.	600	37	198	11,462
Mar.	22	0	7	424	Mar.	28	0	4	234
Apr.	3	0	1	75	Apr.	4	0	0	11
May	44	2	6	390	May	600	0	54	3,340
June	70	19	46	2,742	June	152	16	56	3,342
July	48	4	25	1,546	July	600	14	172	10,644
Aug.	325	40	146	9,042	Aug.	7280	48	963	59,710
Sept.	325	101	170	10,222	Sept.	970	108	276	16,580
Oct.	920	116	265	16,458	Oct.	103	22	49	3,032
Nov.	505	48	183	11,010	Nov.	22	1	10	590
Dec.	218	25	89	5,527	Dec.	1	0	0.5	26
Total	..	..	..	106,084	Total	..	..	..	132,131

Year 1945					Year 1946				
Jan.	139	0	15	912	Jan.	600	0	89	5,493
Feb.	1060	18	187	10,484	Feb.	76	5	26	1,464
Mar.	600	5	115	7,156	Mar.	25	4	8	475
Apr.	4	2	3	184	Apr.	10	0	2	105
May	152	2	47	2,904	May	22	5	10	632
June	5240	18	692	41,496	June	5	2	3	169
July	1350	48	403	24,998	July	28	6	20	1,266
Aug.	810	168	317	19,660	Aug.	6	0	3	200
Sept.	1980	114	399	23,916	Sept.	0	0	0	0
Oct.	114	25	71	4,396	Oct.	8	0	2	98
Nov.	84	14	32	1,890	Nov.	84	0	11	660
Dec.	84	14	31	1,918	Dec.	810	1	50	3,120
Total	..	..	..	139,914	Total	..	..	..	13,682

Year 1947					Year 1948				
Jan.	600	0	20	1,210	Jan.	8300	223	1377	85,368
Feb.	13300	84	1429	80,000	Feb.	223	93	136	7,914
Mar.	7280	31	674	41,776	Mar.	1680	63	305	18,914
Apr.	58	6	23	1,408	Apr.	84	58	68	4,080
May	63	14	28	1,728	May	203	58	109	6,776
June	48	10	23	1,356	June	1200	58	423	25,370
July	53	14	22	1,388	July	600	84	361	22,392
Aug.	244	28	57	3,558	Aug.	3835	84	366	22,712
Sept.	1620	93	383	22,984	Sept.	1350	203	384	23,026
Oct.	1510	76	308	19,100	Oct.	540	84	192	11,926
Nov.	365	93	163	9,780	Nov.	223	48	105	6,322
Dec.	5350	203	2172	134,678	Dec.	69	40	46	2,844
Total	..	..	..	318,966	Total	..	..	..	237,644

Note: From December 1936 to June 1960 Narrabri Creek at Karuah Figures adopt

NARRABRI CREEK AT NARRABRI

Year 1949					Year 1950				
Month	Discharge in cusecs			Discharge for Month Acre Feet	Month	Discharge in cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean			Max.	Min.	Mean	
Jan.	1010	25	165	10,248	Jan.	671	68	234	14,504
Feb.	390	69	172	9,628	Feb.	1250	213	549	30,754
Mar.	223	63	97	5,996	Mar.	318	40	99	6,158
Apr.	185	34	53	3,174	Apr.	23890	213	4610	276,620
May	185	53	77	4,796	May	273	92	127	7,876
June	1680	76	422	25,342	June	14770	273	3440	206,394
July	5930	37	622	38,552	July	36400	1080	10385	643,840
Aug.	10600	152	1080	66,944	Aug.	16200	950	3927	243,460
Sept.	20830	600	5075	304,500	Sept.	950	750	855	51,300
Oct.	13780	761	3183	197,376	Oct.	23200	950	6582	408,080
Nov.	7410	342	1448	86,900	Nov.	35500	2430	11350	680,980
Dec.	1250	178	521	32,274	Dec.	19500	650	2949	182,840
Total	..	..	..	785,730	Total	..	..	..	2,752,806

Year 1951					Year 1952				
Jan.	900	500	653	40,460	Jan.	81	29	63	3,948
Feb.	445	307	382	21,374	Feb.	356	24	95	5,506
Mar.	340	167	216	13,364	Mar.	1050	92	256	5,896
Apr.	225	121	185	11,084	Apr.	258	104	156	9,382
May	225	121	163	10,130	May	2670	81	402	24,946
June	1610	214	545	32,714	June	12800	290	2440	146,416
July	4840	340	1391	86,270	July	2980	389	1116	69,212
Aug.	5870	520	1867	115,760	Aug.	25800	492	4967	308,006
Sept.	1790	121	477	28,628	Sept.	1520	422	628	37,652
Oct.	277	184	231	14,296	Oct.	6140	290	1152	71,428
Nov.	184	58	122	7,310	Nov.	880	52	400	24,012
Dec.	104	29	52	3,222	Dec.	74	36	55	3,412
Total	..	..	..	384,612	Total	..	..	..	709,816

Year 1953					Year 1954				
Jan.	690	46	194	12,014	Jan.	26	8	14	860
Feb.	1710	46	270	15,130	Feb.	2910	10	445	24,938
Mar.	1460	58	247	15,296	Mar.	395	12	85	5,326
Apr.	84	29	51	3,068	Apr.	12	12	12	720
May	1220	41	704	43,636	May	20	12	14	890
June	224	107	162	9,748	June	121	12	48	2,880
July	491	107	235	14,598	July	237	36	54	3,368
Aug.	1770	107	732	45,408	Aug.	168	31	54	3,362
Sept.	1460	167	432	25,892	Sept.	59	24	39	2,326
Oct.	358	107	194	12,010	Oct.	5510	24	989	61,332
Nov.	95	58	79	4,756	Nov.	11600	121	2134	128,052
Dec.	58	9	37	2,310	Dec.	365	84	211	13,090
Total	..	..	..	203,866	Total	..	..	..	247,144

Year 1955					Year 1956				
Jan.	2360	47	416	25,790	Jan.	890	293	479	29,672
Feb.	80000	39	6499	363,952	Feb.	34900	455	9501	551,040
Mar.	56000	690	8119	503,406	Mar.	11800	920	3287	203,846
Apr.	880	430	553	33,160	Apr.	3270	640	1143	68,554
May	430	380	401	24,860	May	20020	1340	6850	424,680
June	2670	186	683	40,964	June	25800	1560	5776	346,552
July	1990	480	820	50,820	July	13700	1990	6744	418,114
Aug.	4900	665	1324	82,070	Aug.	9430	1200	2741	169,960
Sept.	2670	530	893	53,560	Sept.	120	800	939	56,320
Oct.	31100	380	5370	332,916	Oct.	4640	438	1179	72,876
Nov.	8730	920	1870	112,214	Nov.	1340	350	746	44,768
Dec.	1130	690	865	53,640	Dec.	690	209	417	25,838
Total	..	..	..	1,677,352	Total	..	..	..	2,412,220

Note: From December 1936 to June 1960 Narrabri Creek at Karuah figures adopted

NARRABRI CREEK AT NARRABRI

Year 1957					Year 1958				
Month	Discharge in cusecs			Discharge for Month Acre Feet	Month	Discharge in cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean			Max.	Min.	Mean	
Jan.	590	58	290	18,000	Jan.	320	30	80	4,940
Feb.	490	210	271	15,200	Feb.	157.0	44	190	10,600
Mar.	440	210	299	18,600	Mar.	81	38	47	2,890
Apr.	590	176	239	14,300	Apr.	38	22	28	1,660
May	230	193	206	12,800	May	145	22	50	3,080
June	193	102	138	8,300	June	55	42	48	2,860
July	290	159	207	12,800	July	320	61	158	9,830
Aug.	290	91	195	12,100	Aug.	990	86	238	14,800
Sept.	490	102	220	13,200	Sept.	3780	250	767	46,000
Oct.	91	43	66	4,100	Oct.	7920	590	1717	106,000
Nov.	49	30	42	2,490	Nov.	440	143	216	12,900
Dec.	38	28	32	1,980	Dec.	3530	91	578	35,900
Total	..	..	..	133,870	Total	..	..	..	251,460

Year 1959					Year 1960				
Jan.	2115	102	476	29,500	Jan.	480	129	245	15,200
Feb.	4210	80	805	45,100	Feb.	155	89	102	5,900
Mar.	2500	540	1045	64,800	Mar.	155	34	71	4,420
Apr.	640	38	246	14,800	Apr.	129	65	82	4,910
May	129	34	98	6,050	May	155	118	134	8,280
June	94	72	78	4,660	June	118	89	99	5,910
July	1820	72	405	25,100	July	1955	27	408	25,276
Aug.	530	166	317	19,600	Aug.	2400	165	522	32,340
Sept.	440	94	154	9,260	Sept.	1810	130	300	17,978
Oct.	580	56	284	17,600	Oct.	445	65	138	8,558
Nov.	1650	225	652	39,100	Nov.	6400	57	858	51,460
Dec.	2840	260	816	50,600	Dec.	13900	85	1706	105,788
Total	..	..	..	326,170	Total	..	..	..	286,020

Year 1961					Year 1962				
Jan.	490	30	215	13,352	Jan.	28000	170	3859	239,246
Feb.	55	2	20	1,142	Feb.	1260	820	1064	61,694
Mar.	310	5	68	4,204	Mar.	820	610	643	39,880
Apr.	219	45	95	5,682	Apr.	610	130	295	17,708
May	140	83	97	6,026	May	310	130	186	11,500
June	280	83	99	5,914	June	610	118	254	15,200
July	83	45	67	4,158	July	470	118	174	10,800
Aug.	760	30	147	9,106	Aug.	1485	215	502	31,100
Sept.	290	68	107	6,428	Sept.	592	205	382	22,900
Oct.	290	41	58	3,612	Oct.	4000	310	976	60,500
Nov.	2400	41	442	26,538	Nov.	1850	970	1330	79,600
Dec.	2050	78	632	39,166	Dec.	1220	195	727	45,100
Total	..	..	..	125,328	Total	..	..	..	635,228

Year 1963					Year 1964				
Jan.	3200	175	768	47,600	Jan.	38500	355	5560	345,000
Feb.	405	118	231	13,000	Feb.	935	710	796	46,200
Mar.	770	155	274	17,000	Mar.	1320	215	527	32,700
Apr.	930	136	273	16,400	Apr.	5600	156	773	47,600
May	10000	118	2610	162,000	May	1060	300	777	48,200
June	13100	1010	3320	199,000	June	1610	225	711	42,700
July	1530	970	1150	71,000	July	6500	560	1930	120,000
Aug.	3200	930	1260	77,800	Aug.	2230	595	1040	64,700
Sept.	5750	925	1630	98,000	Sept.	1305	490	776	46,570
Oct.	1185	880	932	57,800	Oct.	4660	940	1730	107,000
Nov.	880	580	706	42,400	Nov.	1180	860	928	55,700
Dec.	1230	385	711	44,100	Dec.	940	330	579	35,900
Total	..	..	..	846,100	Total	..	..	..	992,270

* Note: From December 1936 to June 1960 Narrabri Creek at Karuah figures adopt

NARRABRI CREEK AT NARRABRI

Year 1965					Year 1966				
Month	Discharge in cusecs			Discharge for Month Acre Feet	Month	Discharge in cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean			Max.	Min.	Mean	
Jan.	420	300	354	22,000	Jan.	520	342	426	26,400
Feb.	360	278	297	16,700	Feb.	560	410	458	25,600
Mar.	278	62	222	13,700	Mar.	485	116	304	18,900
Apr.	108	34	88	5,300	Apr.	127	40	57	3,400
May	92	76	80	4,940	May	68	30	47	2,910
June	65	65	65	3,900	June	40	18	28	1,660
July	85	50	67	4,160	July	18	14	16	990
Aug.	143	85	128	7,950	Aug.	165	14	40	2,450
Sept.	520	122	243	14,600	Sept.	198	46	79	4,730
Oct.	600	362	523	32,400	Oct.	360	46	146	9,020
Nov.	440	231	354	21,200	Nov.	2800	164	463	27,800
Dec.	1720	127	498	30,900	Dec.	402	203	319	19,800
Total	..	..	..	177,750	Total	..	..	..	143,660

Year 1967					Year 1968				
Jan.	No Records			29,000*	Jan.	17000	192	2170	135,000
Feb.	No Records			25,000*	Feb.	985	475	665	38,[illegible]00
Mar.	No Records			16,600*	Mar.	525	85	232	14,400
Apr.	60	26	42	2,500	Apr.	94	68	76	4,570
May	103	32	58	3,570	May	2750	76	422	26,200
June	50	32	37	2,210	June	276	85	135	8,130
July	81	40	59	3,650	July	1325	85	324	20,100
Aug.	114	32	70	4,320	Aug.	6500	175	1333	82,600
Sept.	183	103	143	8,590	Sept.	3500	276	722	43,300
Oct.	402	195	276	17,100	Oct.	1255	150	301	18,700
Nov.	264	218	226	13,600	Nov.	340	150	239	14,300
Dec.	375	227	292	18,100	Dec.	420	118	260	16,100
Total	..	..	..	144,240*	Total	..	..	..	422,000

* Estimated

NAMOI RIVER AT GOANGRA

LOCATION:	Latitude 30°09' Longitude 148°23'
PERIOD OF ESTABLISHMENT:	August 1954 to Date
COMPLETE YEARS OF COMPUTED RECORDS:	14 years
ZERO OF GAUGE:	R.L.77.60 Assumed Datum (Approximately 450 feet above mean sea level)
CATCHMENT AREA:	14,000 square miles
CONTROL:	Earth
EQUIPMENT:	Automatic Recorder (Float Type) installed May 1958 Staff gauge, range 0-30 feet
CURRENT METER OBSERVATIONS:	(a) Number obtained : 95 (b) Maximum observation in cusecs : 2,630 (c) Minimum observation in cusecs : 5.9
MAXIMUM ESTIMATED DISCHARGE DURING PERIOD OF RECORDS:	13,400 cusecs
MEAN DAILY DISCHARGE FOR 14 YEARS: (See Remarks)	786 cusecs
MEAN ANNUAL DISCHARGE FOR 14 YEARS: (See Remarks)	574,000 acre feet
REMARKS:	As from March 1960 flows were partly due to controlled releases from Keepit Dam. During high flows, large quantities of water by-pass Goangra through effluent creeks and since 1964 pumped diversions have occurred into Gunidgera Creek.

NAMOI RIVER AT GOANGRA

Year 1954					Year 1955				
Month	Discharge in cusecs			Discharge for Month Acre Feet	Month	Discharge in cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean			Max.	Min.	Mean	
Jan.	..	..	..	..	Jan.	2220	61	451	27,988
Feb.	..	..	..	..	Feb.	2140	43	616	34,492
Mar.	..	..	..	..	Mar.	13400	811	5480	340,000
Apr.	..	..	..	..	Apr.	797	437	551	33,094
May	..	..	..	..	May	701	314	498	30,858
June	..	..	..	..	June	1130	280	531	31,882
July	..	..	..	..	July	2220	502	1254	77,740
Aug.	107	62	86	5,328	Aug.	2030	742	1312	81,354
Sept.	58	27	35	2,120	Sept.	3010	783	1798	107,864
Oct.	3460	12	1171	72,600	Oct.	5720	528	1448	89,800
Nov.	3580	2420	2920	175,000	Nov.	10180	1190	4925	295,000
Dec.	2460	204	615	38,112	Dec.	2220	646	1198	74,256
Total	..	..	..	..	Total	..	..	..	1,224,328

Year 1956					Year 1957				
Jan.	4820	296	1531	94,900	Jan.	715	333	544	33,800
Feb.	12250	797	4207	244,000	Feb.	323	234	277	15,500
Mar.	7870	3250	5509	342,000	Mar.	450	225	310	19,200
Apr.	3010	1095	2025	121,490	Apr.	470	174	223	13,400
May	5640	1150	4053	251,000	May	480	163	246	15,250
June	5890	3940	4930	296,000	June	163	139	152	9,140
July	10300	4350	7805	484,000	July	470	138	320	19,800
Aug.	5560	2460	4113	255,000	Aug.	781	153	249	15,400
Sept.	2380	1190	1545	92,670	Sept.	792	299	437	26,200
Oct.	3150	985	1649	102,230	Oct.	No Records			7,000
Nov.	1650	693	1158	69,482	Nov.	No Records			2,400
Dec.	1030	682	806	49,968	Dec.	16	8	14	846
Total	..	..	..	2,402,740	Total	..	..	..	177,936

Year 1958					Year 1959				
Jan.	122	12	40	2,500	Jan.	1250	248	587	36,396
Feb.	1300	29	358	20,100	Feb.	3600	156	1411	79,002
Mar.	229	49	109	6,780	Mar.	2680	906	1472	91,254
Apr.	45	18	33	1,900	Apr.	2350	413	1000	59,996
May	101	10	31	1,896	May	400	116	204	12,630
June	98	45	64	3,832	June	182	116	142	8,516
July	368	70	180	11,142	July	1130	132	355	22,038
Aug.	870	126	263	16,328	Aug.	1150	388	674	41,818
Sept.	1630	373	750	44,978	Sept.	451	132	216	12,942
Oct.	2815	464	1655	102,604	Oct.	630	192	344	21,298
Nov.	978	248	423	25,426	Nov.	1177	401	639	38,324
Dec.	646	230	402	24,954	Dec.	1065	412	610	37,818
Total	..	..	..	262,440	Total	..	..	..	462,032

Year 1960					Year 1961				
Jan.	1140	194	535	33,170	Jan.	1115	139	334	20,738
Feb.	166	64	101	5,854	Feb.	635	62	141	7,884
Mar.	139	46	74	4,570	Mar.	339	69	103	6,410
Apr.	78	52	60	3,760	Apr.	387	69	150	8,994
May	162	78	120	7,412	May	101	79	89	5,508
June	122	78	88	5,252	June	118	82	107	6,396
July	1285	88	443	27,486	July	195	62	89	5,532
Aug.	1795	309	696	43,120	Aug.	596	62	136	8,442
Sept.	314	134	203	12,192	Sept.	602	77	274	16,424
Oct.	965	152	340	21,058	Oct.	77	25	45	2,806
Nov.	1950	170	486	29,160	Nov.	1065	25	100	6,022
Dec.	2480	324	1110	68,824	Dec.	2570	642	1358	84,188
Total	..	..	..	261,858	Total	..	..	..	179,344

* Estimated

NAMOI RIVER AT GOANGRA

Year 1962					Year 1963				
Month	Discharge in cusecs			Discharge for Month Acre Feet	Month	Discharge in cusecs			Discharge for month Acre Feet
	Max.	Min.	Mean			Max.	Min.	Mean	
Jan.	3760	165	1428	88,520	Jan.	1890	286	929	57,624
Feb.	3840	1210	2023	113,294	Feb.	708	152	289	16,176
Mar.	1740	829	1116	69,172	Mar.	1280	136	245	15,188
Apr.	874	212	518	31,100	Apr.	2010	133	656	39,336
May	547	156	257	15,930	May	2790	122	1369	84,878
June	570	239	375	22,484	June	5000	2430	3490	209,370
July	271	176	229	141,700	July	2010	1250	1507	93,458
Aug.	1637	188	630	39,054	Aug.	1550	1060	1251	77,576
Sept.	1625	335	792	47,528	Sept.	3390	1170	2101	126,050
Oct.	2230	382	788	48,836	Oct.	1710	910	1178	73,046
Nov.	2330	910	1483	88,992	Nov.	883	426	686	41,170
Dec.	1625	330	1134	70,334	Dec.	1407	413	793	49,158
Total	..	..	..	776,944	Total	..	..	..	883,030

Year 1964					Year 1965				
Jan.	6600	281	2063	127,896	Jan.	286	65	174	10,800
Feb.	4550	716	1246	72,274	Feb.	148	52	97	5,410
Mar.	1200	297	656	40,644	Mar.	172	17	77	4,754
Apr.	1600	172	336	20,100	Apr.	70	23	45	2,720
May.	2510	439	1193	73,900	May	No Records			1,600
June	1710	376	773	46,400	June	20	5	10	570
July	3180	645	1860	115,000	July	52	20	39	2,390
Aug.	2510	740	1207	74,900	Aug.	41	11	23	1,440
Sept.	1650	495	964	57,900	Sept.	66	20	45	2,720
Oct.	2900	585	1980	123,000	Oct.	194	8	94	5,820
Nov.	1160	756	956	57,400	Nov.	154	10	58	3,510
Dec.	856	266	552	34,200	Dec.	1240	23	469	29,100
Total	..	..	..	843,614	Total	..	..	..	70,834

Year 1966					Year 1967				
Jan.	186	6	75	4,670	Jan.	240	14	86	5,310
Feb.	157	2	54	3,020	Feb.	92	15	32	1,800
Mar.	129	1	23	1,450	Mar.	2400	27	683	42,350
Apr.	49	2	12	734	Apr.	40	6	16	996
May	18	0	4	260	May	51	5	22	1,360
June	109	2	39	2,310	June	64	31	40	2,410
July	25	10	19	1,170	July	97	45	64	4,000
Aug.	400	6	58	3,590	Aug.	83	24	42	2,610
Sept.	928	21	175	10,500	Sept.	29	1.5	6.9	412
Oct.	201	18	71	4,400	Oct.	119	0.1	11	682
Nov.	1480	29	467	28,000	Nov.	12	0	3.4	203
Dec.	280	21	97	6,000	Dec.	164	0	2.5	156
Total	..	..	..	66,104	Total	..	..	..	62,292

Year 1968				
Jan.	3250	8	1110	68,800
Feb.	487	31	174	10,100
Mar.	324	23	112	6,940
Apr.	40	18	29	1,760
May	3530	19	1055	65,400
June	376	101	212	12,700
July	1140	72	273	16,900
Aug.	2290	198	1172	72,700
Sept.	2790	230	1420	85,100
Oct.	1040	53	294	18,200
Nov.	131	11	58	3,490
Dec.	413	9.5	124	7,680
Total	..	..	..	369,770

* Estimated

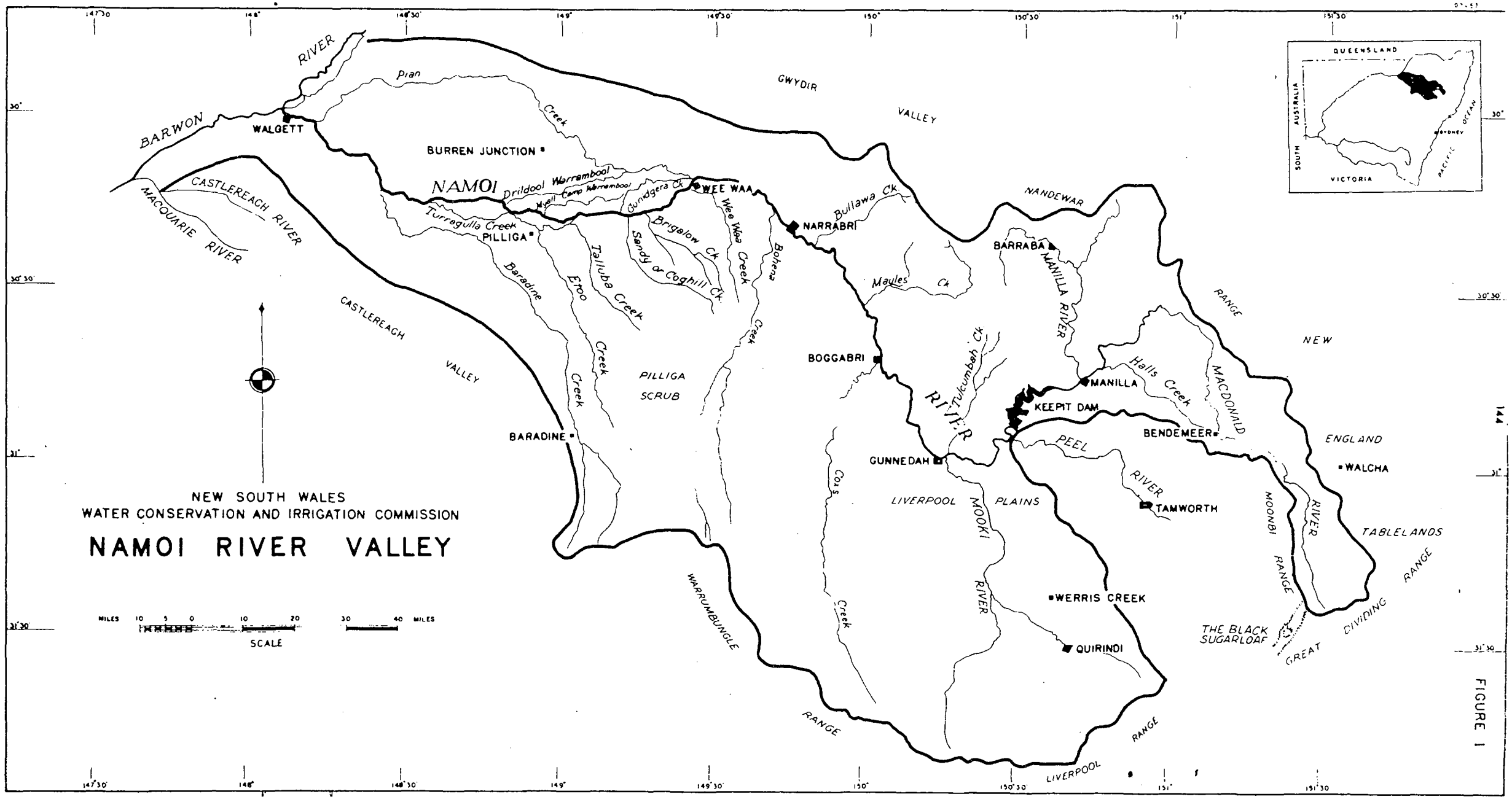

NEW SOUTH WALES
WATER CONSERVATION AND IRRIGATION COMMISSION
NAMOI RIVER VALLEY
SCALE
MILES
QUEENSLAND
AUSTRALIA
SOUTH
VICTORIA
SYDNEY
PACIFIC
OCEAN
BARWON
RIVER
WALGETT
Pian
Creek
BURREN JUNCTION
NAMOI
Drildool
Warrambool
Mell Camp
Warrambool
Gunidgera Ck
WEE WAA
Wee Waa Creek
Bohena
Creek
Bullawa Ck
NARRABRI
GWYDIR
VALLEY
NANDEWAR
RANGE
NEW
ENGLAND
TABLELANDS
RANGE
MACQUARIE RIVER
CASTLEREACH RIVER
CASTLEREACH
VALLEY
Turrawulla Creek
PILLIGA
Baradine
Etoo
Creek
Tallubá Creek
Sandy or Coghill Ck
Brigalow Ck
Maules Ck
BARRABA
MANILLA RIVER
BOGGABRI
PILLIGA
SCRUB
BARADINE
Tulcumbah Ck
RIVER
MANILLA
KEEPIT DAM
Halls Creek
MACDONALD
BENDEMEER
PEEL
RIVER
GUNNEDAH
Cows
Creek
LIVERPOOL
PLAINS
MOOKI
RIVER
TAMWORTH
WALCHA
MOONBI
RANGE
RIVER
WARRUMBUNGLE
RANGE
WERRIS CREEK
QUIRINDI
THE BLACK
SUGARLOAF
GREAT
DIVIDING
RANGE
LIVERPOOL
RANGE

FIGURE 1

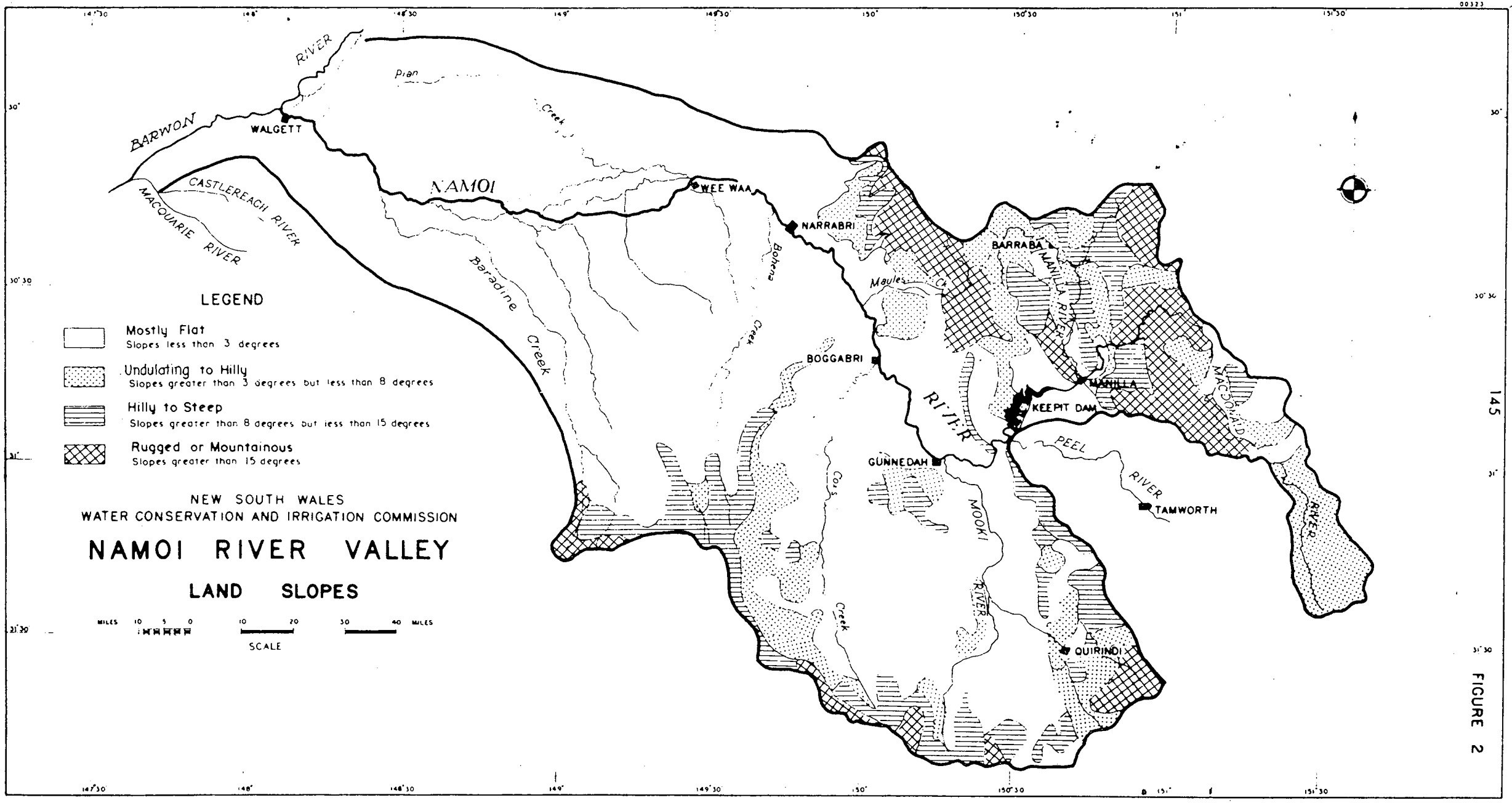

NEW SOUTH WALES
WATER CONSERVATION AND IRRIGATION COMMISSION
NAMOI RIVER VALLEY
LAND SLOPES
LEGEND
Mostly Flat
Slopes less than 3 degrees
Undulating to Hilly
Slopes greater than 3 degrees but less than 8 degrees
Hilly to Steep
Slopes greater than 8 degrees but less than 15 degrees
Rugged or Mountainous
Slopes greater than 15 degrees
MILES 10 5 0
10 20
30 40 MILES
SCALE
NAMOI
BARWON
RIVER
WALGETT
CASTLEREAGH RIVER
MACQUARIE RIVER
Pian
Creek
WEE WAA
NARRABRI
Baradine Creek
Bohena Creek
Maules Ck
BOGGABRI
BARRABA
MANILLA RIVER
MANILLA
KEEPIT DAM
MACDONALD
RIVER
PEEL
RIVER
TAMWORTH
GUNNEDAH
Cox's Creek
MOOKI
RIVER
QUIRINDI
RIVER
147°30'
148°
148°30'
149°
149°30'
150°
150°30'
151°
151°30'
30'
30°30'
31°
31°30'

FIGURE 2

145

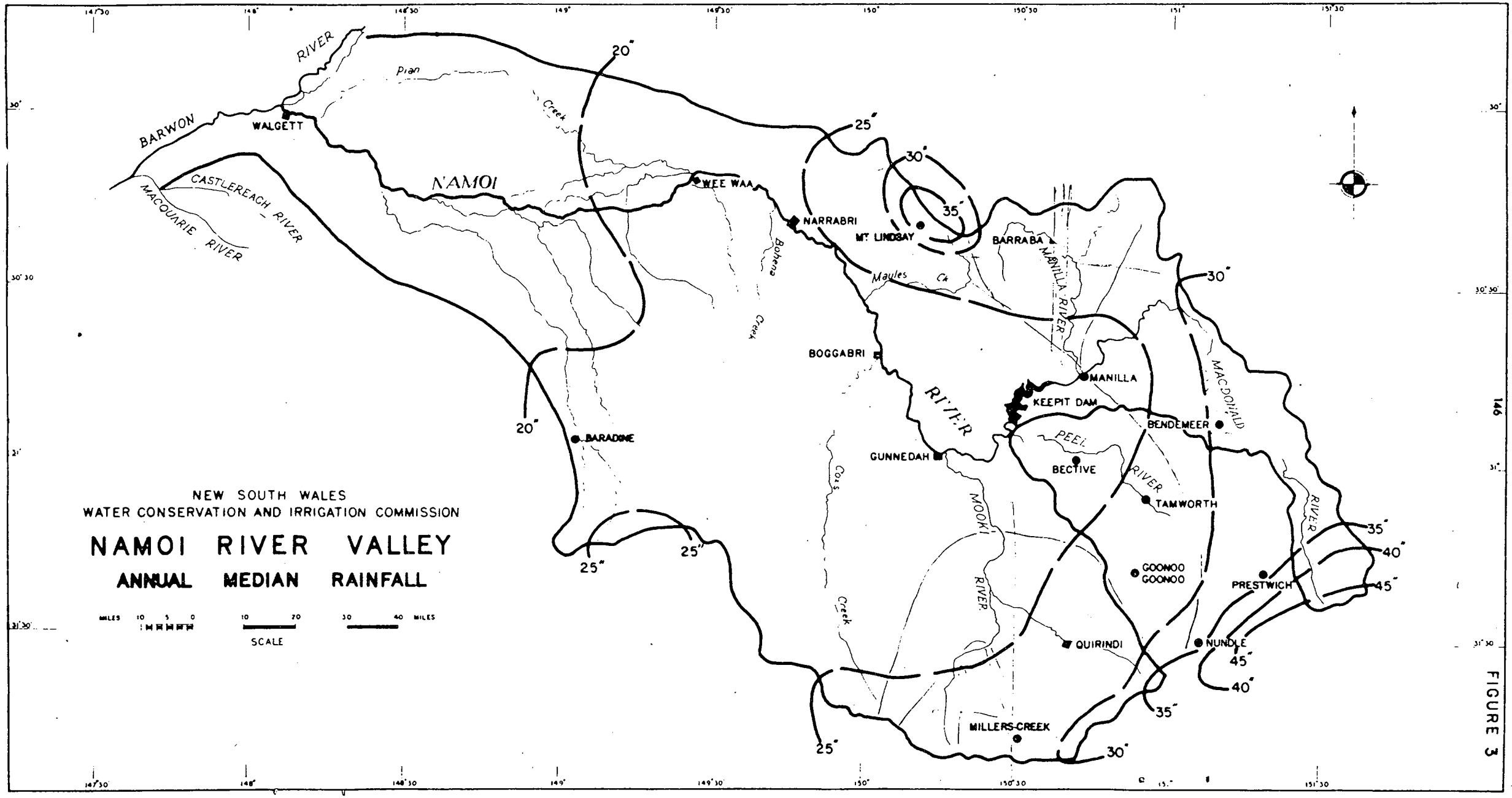

NEW SOUTH WALES
WATER CONSERVATION AND IRRIGATION COMMISSION
NAMOI RIVER VALLEY
ANNUAL MEDIAN RAINFALL
MILES 10 5 0
10 20 30 40 MILES
SCALE
BARWON
RIVER
WALGETT
CASTLEREAGH RIVER
MACQUARIE RIVER
NAMOI
Pian
Creek
WEE WAA
NARRABRI
Mt LINDSAY
Maules Ck
Bohena
Creek
BOGGABRI
BARADINE
GUNNEDAH
Cous
Creek
MOOKI
RIVER
QUIRINDI
MILLERS CREEK
BARRABA
MANILLA RIVER
MANILLA
KEEPIT DAM
RIVER
PEEL
RIVER
BECTIVE
TAMWORTH
BENDEMEER
MACDONALD
RIVER
GOONOO GOONOO
PRESTWICH
NUNDLE
20"
25"
30"
35"
40"
45"

FIGURE 3

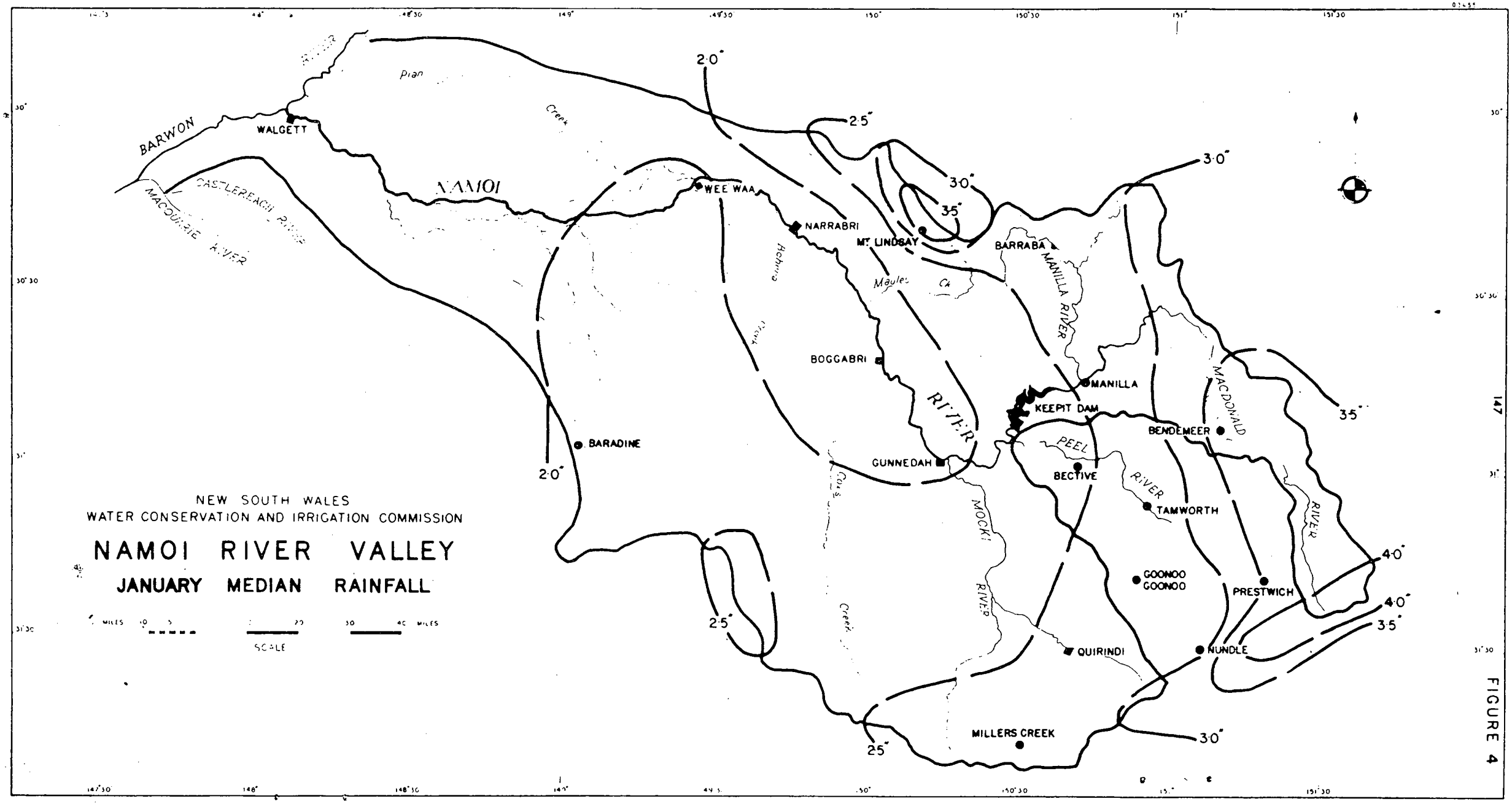

NEW SOUTH WALES
WATER CONSERVATION AND IRRIGATION COMMISSION
NAMOI RIVER VALLEY
JANUARY MEDIAN RAINFALL
SCALE
BARWON
WALGETT
CASTLEREAGH RIVER
MACQUARIE RIVER
NAMOI
Pian
Creek
WEE WAA
NARRABRI
MT. LINDSAY
BARRABA
MANILLA RIVER
Maules Ck
BOGGABRI
RIVER
MANILLA
KEEPIT DAM
MACDONALD
BENDEMEER
PEEL
RIVER
BECTIVE
TAMWORTH
BARADINE
GUNNEDAH
MOKI
RIVER
GOONOO GOONOO
PRESTWICH
QUIRINDI
NUNDLE
MILLERS CREEK
2·0"
2·5"
3·0"
3·5"
4·0"

FIGURE 4

147

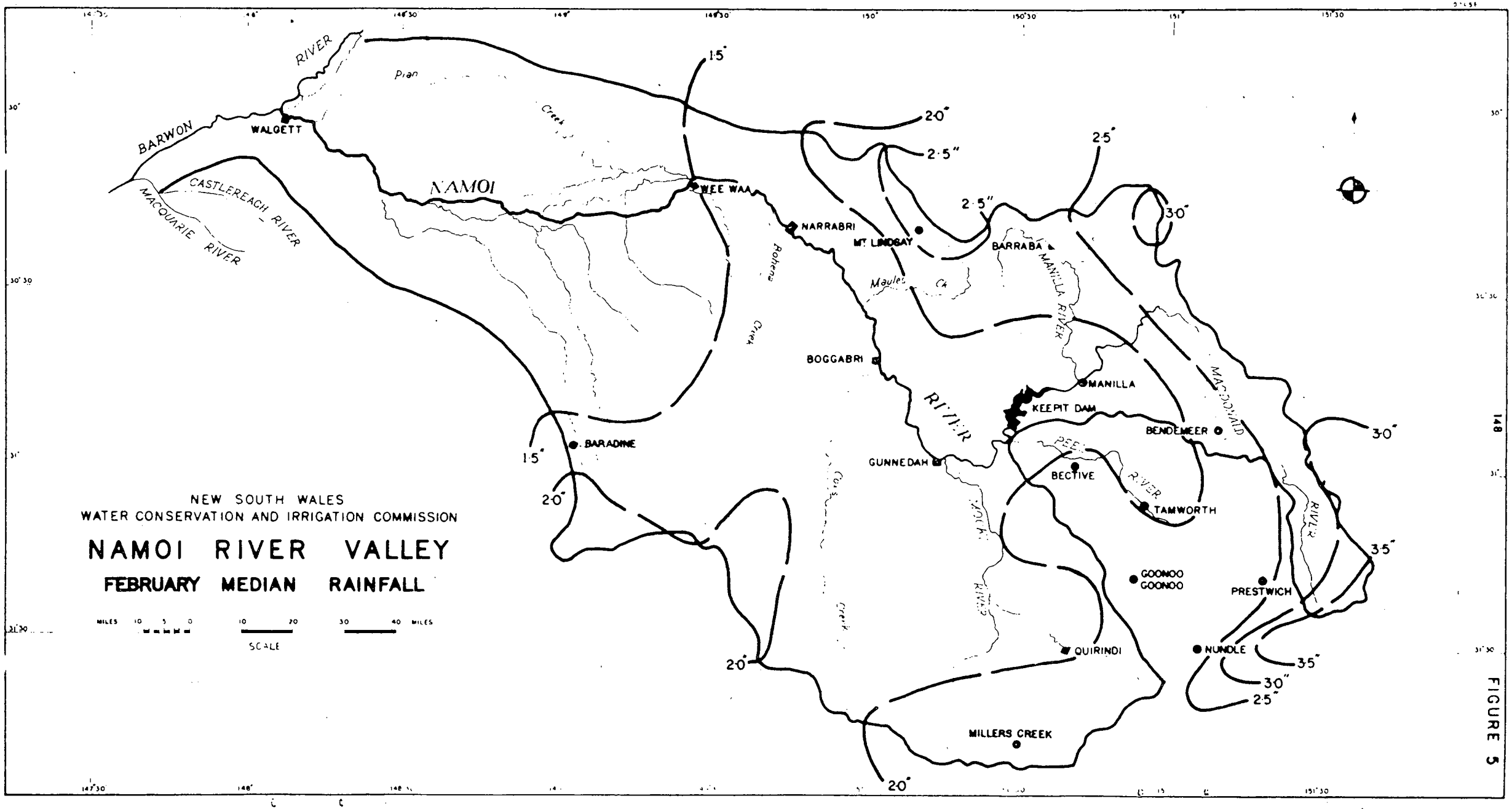

NEW SOUTH WALES
WATER CONSERVATION AND IRRIGATION COMMISSION
NAMOI RIVER VALLEY
FEBRUARY MEDIAN RAINFALL
MILES 10 5 0
10 20
30 40 MILES
SCALE
BARWON
RIVER
WALGETT
CASTLEREAGH RIVER
MACQUARIE RIVER
NAMOI
Pian
Creek
WEE WAA
NARRABRI
MT. LINDSAY
Maules Ck
Bohena
Creek
BOGGABRI
BARADINE
GUNNEDAH
RIVER
BARRABA
MANILLA RIVER
MANILLA
KEEPIT DAM
BENDEMEER
PEEL
RIVER
BECTIVE
TAMWORTH
MACDONALD
RIVER
GOONOO GOONOO
PRESTWICH
NUNDLE
QUIRINDI
MILLERS CREEK
1·5"
2·0"
2·5"
3·0"
3·5"

FIGURE 5

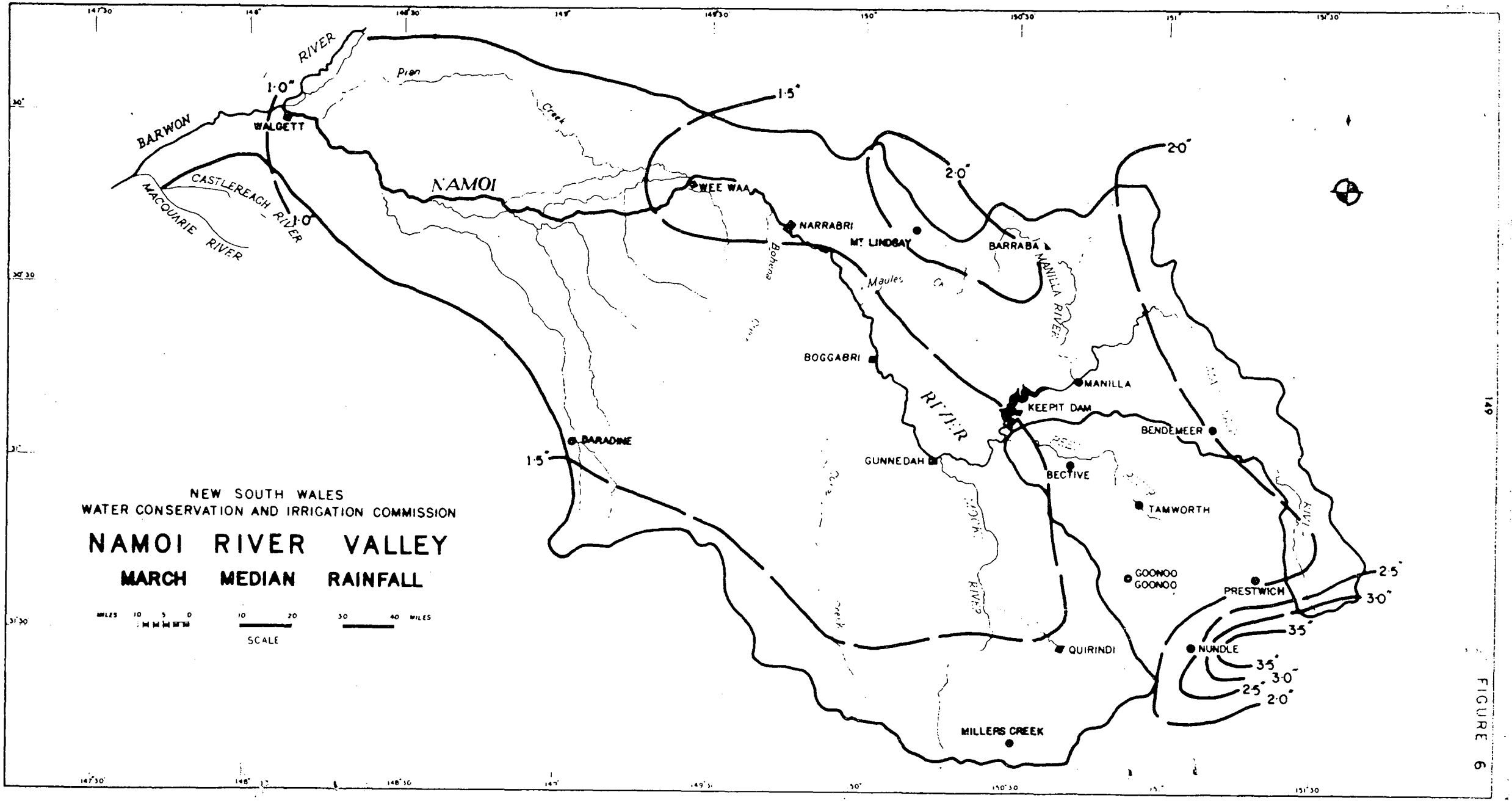

NEW SOUTH WALES
WATER CONSERVATION AND IRRIGATION COMMISSION
NAMOI RIVER VALLEY
MARCH MEDIAN RAINFALL
SCALE
NAMOI
RIVER
BARWON
CASTLEREACH RIVER
MACQUARIE RIVER
WALGETT
WEE WAA
NARRABRI
Mt. LINDSAY
BARRABA
MANILLA RIVER
BOGGABRI
MANILLA
KEEPIT DAM
BENDEMEER
BARADINE
GUNNEDAH
BECTIVE
TAMWORTH
GOONOO GOONOO
PRESTWICH
QUIRINDI
NUNDLE
MILLERS CREEK
Pian
Creek
Bohena
Maules
1·0"
1·5"
2·0"
2·5"
3·0"
3·5"

FIGURE 6

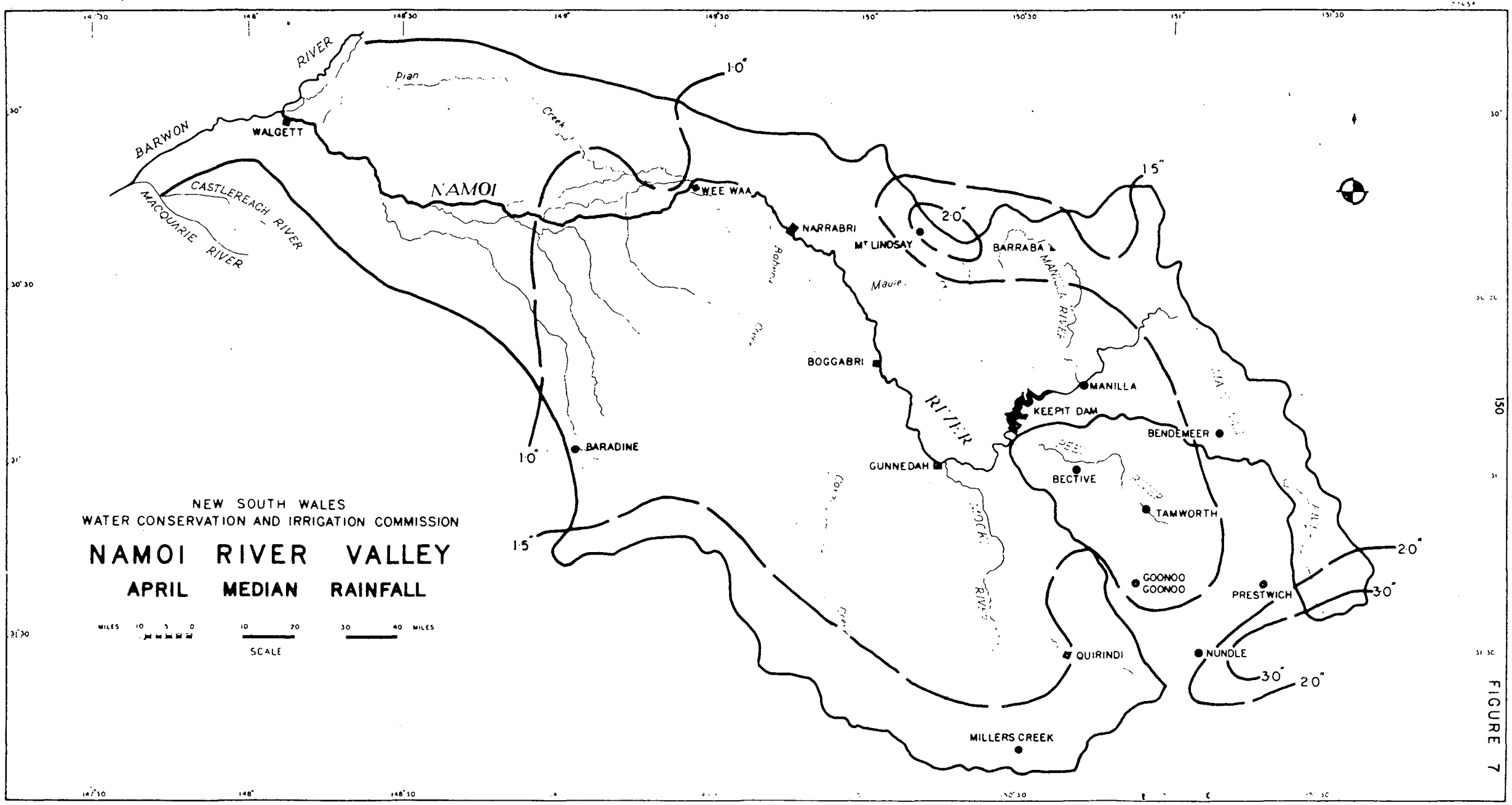
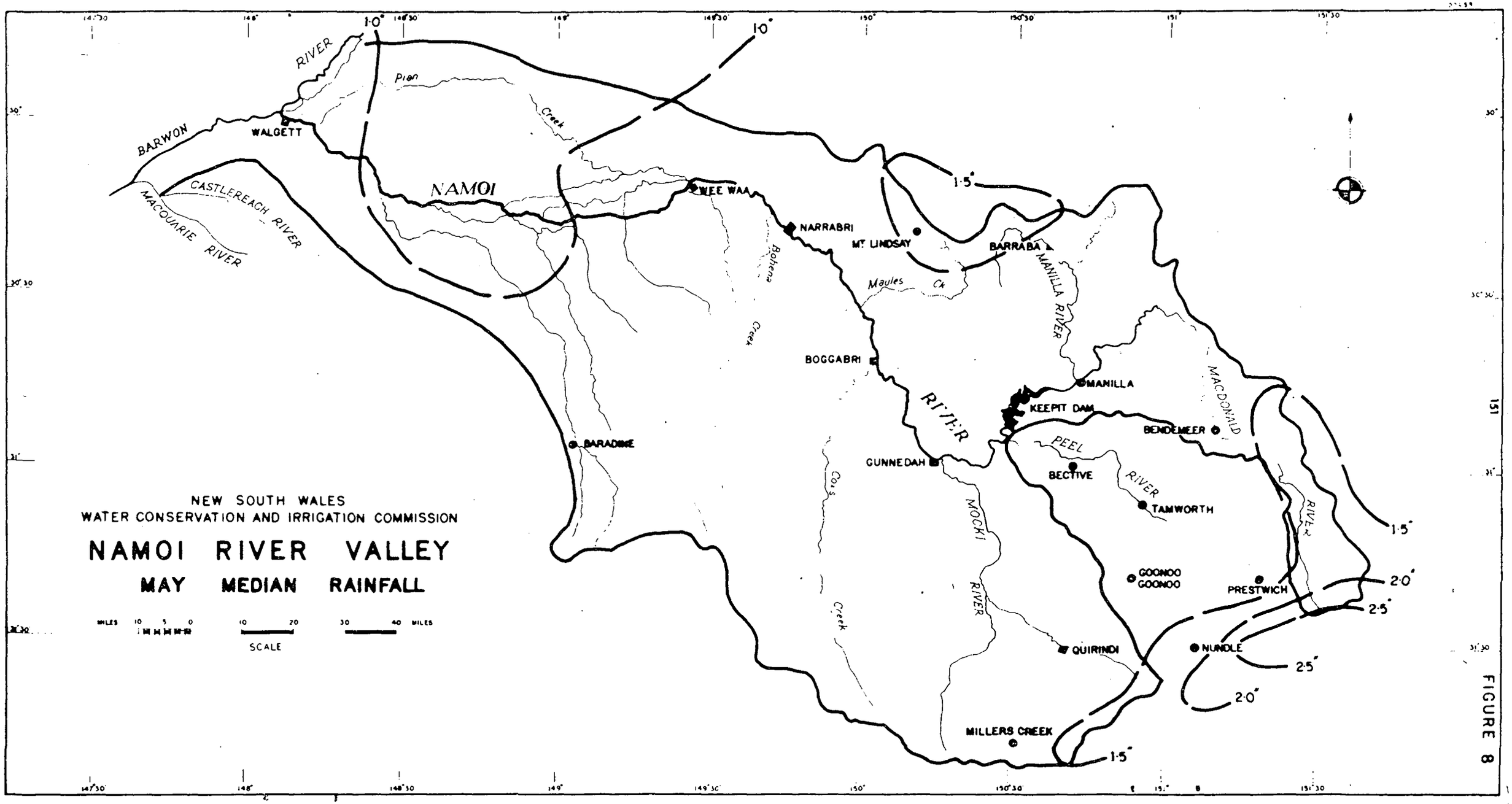

NEW SOUTH WALES
WATER CONSERVATION AND IRRIGATION COMMISSION
NAMOI RIVER VALLEY
APRIL MEDIAN RAINFALL
MILES 10 5 0
10 20
30 40 MILES
SCALE
BARWON RIVER
WALGETT
CASTLEREACH RIVER
MACQUARIE RIVER
NAMOI
Pian Creek
WEE WAA
NARRABRI
Mt LINDSAY
BARRABA
Mauie
BOGGABRI
MANILLA
KEEPIT DAM
BENDEMEER
BECTIVE
TAMWORTH
GUNNEDAH
BARADINE
GOONOO GOONOO
PRESTWICH
QUIRINDI
NUNDLE
MILLERS CREEK
1·0"
1·5"
2·0"
3·0"

FIGURE 7


NEW SOUTH WALES
WATER CONSERVATION AND IRRIGATION COMMISSION
NAMOI RIVER VALLEY
MAY MEDIAN RAINFALL
MILES 10 5 0
10 20
30 40 MILES
SCALE
BARWON
RIVER
WALGETT
CASTLEREACH RIVER
MACQUARIE RIVER
NAMOI
Pian
Creek
WEE WAA
NARRABRI
Mt LINDSAY
Maules Ck
BARRABA
MANILLA RIVER
Bohena
Creek
BOGGABRI
MANILLA
KEEPIT DAM
MACDONALD
RIVER
BENDEMEER
PEEL
RIVER
BECTIVE
TAMWORTH
BARADINE
GUNNEDAH
Cox's
Creek
MOOKI
RIVER
GOONOO GOONOO
PRESTWICH
RIVER
QUIRINDI
NUNDLE
MILLERS CREEK
1·0"
1·5"
2·0"
2·5"
151
FIGURE 8

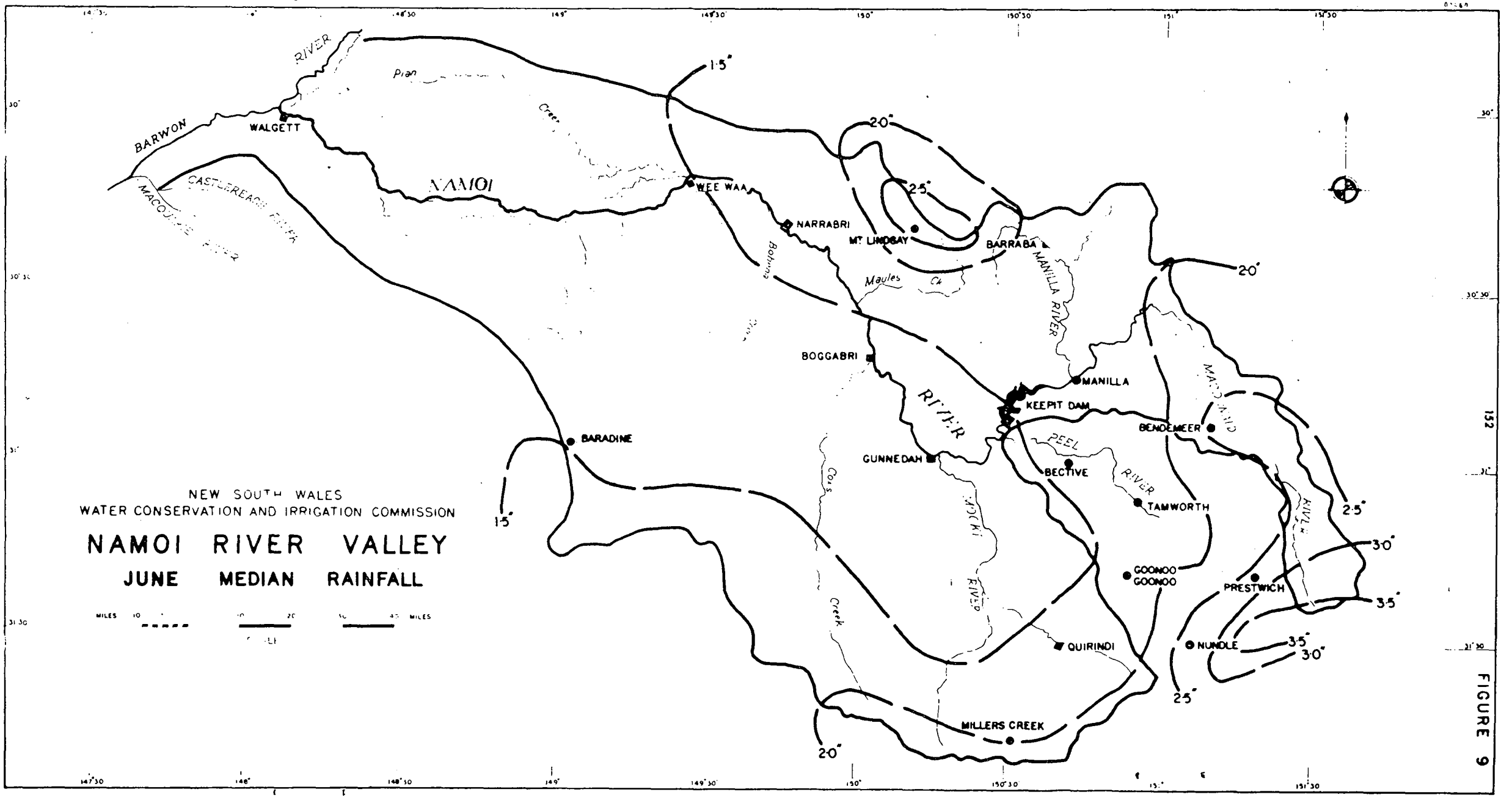

NEW SOUTH WALES
WATER CONSERVATION AND IRRIGATION COMMISSION
NAMOI RIVER VALLEY
JUNE MEDIAN RAINFALL
MILES
BARWON
RIVER
WALGETT
CASTLEREAGH RIVER
MACQUARIE RIVER
NAMOI
WEE WAA
NARRABRI
Mt. LINDSAY
BARRABA
MANILLA RIVER
Mayles Ck
BOGGABRI
MANILLA
KEEPIT DAM
RIVER
BENDEMEER
PEEL
RIVER
BECTIVE
TAMWORTH
GUNNEDAH
BARADINE
Cox's Creek
MACKI RIVER
GOONOO GOONOO
PRESTWICH
NUNDLE
QUIRINDI
MILLERS CREEK
1·5"
2·0"
2·5"
3·0"
3·5"

FIGURE 9

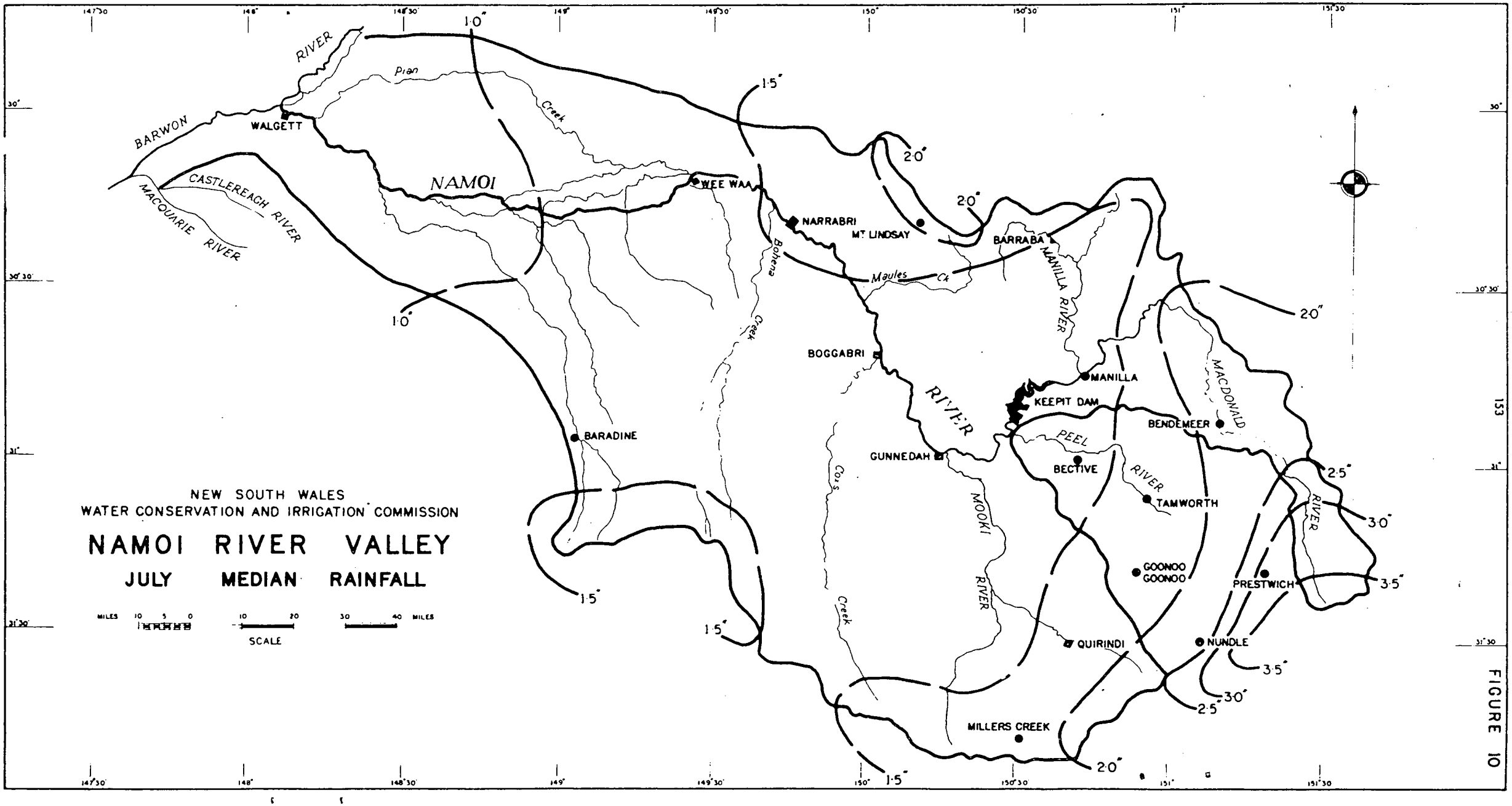

NEW SOUTH WALES
WATER CONSERVATION AND IRRIGATION COMMISSION
NAMOI RIVER VALLEY
JULY MEDIAN RAINFALL
MILES 10 5 0
10 20
30 40 MILES
SCALE
BARWON RIVER
WALGETT
Pian Creek
NAMOI
CASTLEREAGH RIVER
MACQUARIE RIVER
WEE WAA
NARRABRI
MT LINDSAY
Bohena Creek
Maules Ck
BARRABA
MANILLA RIVER
BOGGABRI
MANILLA
KEEPIT DAM
RIVER
MACDONALD
BENDEMEER
PEEL
RIVER
BECTIVE
TAMWORTH
BARADINE
GUNNEDAH
Cox's Creek
MOOKI RIVER
GOONOO GOONOO
PRESTWICH
QUIRINDI
NUNDLE
MILLERS CREEK
1·0"
1·5"
2·0"
2·5"
3·0"
3·5"
147°30'
148°
148°30'
149°
149°30'
150°
150°30'
151°
151°30'
30'
30°30'
31°
31°30'

FIGURE 10

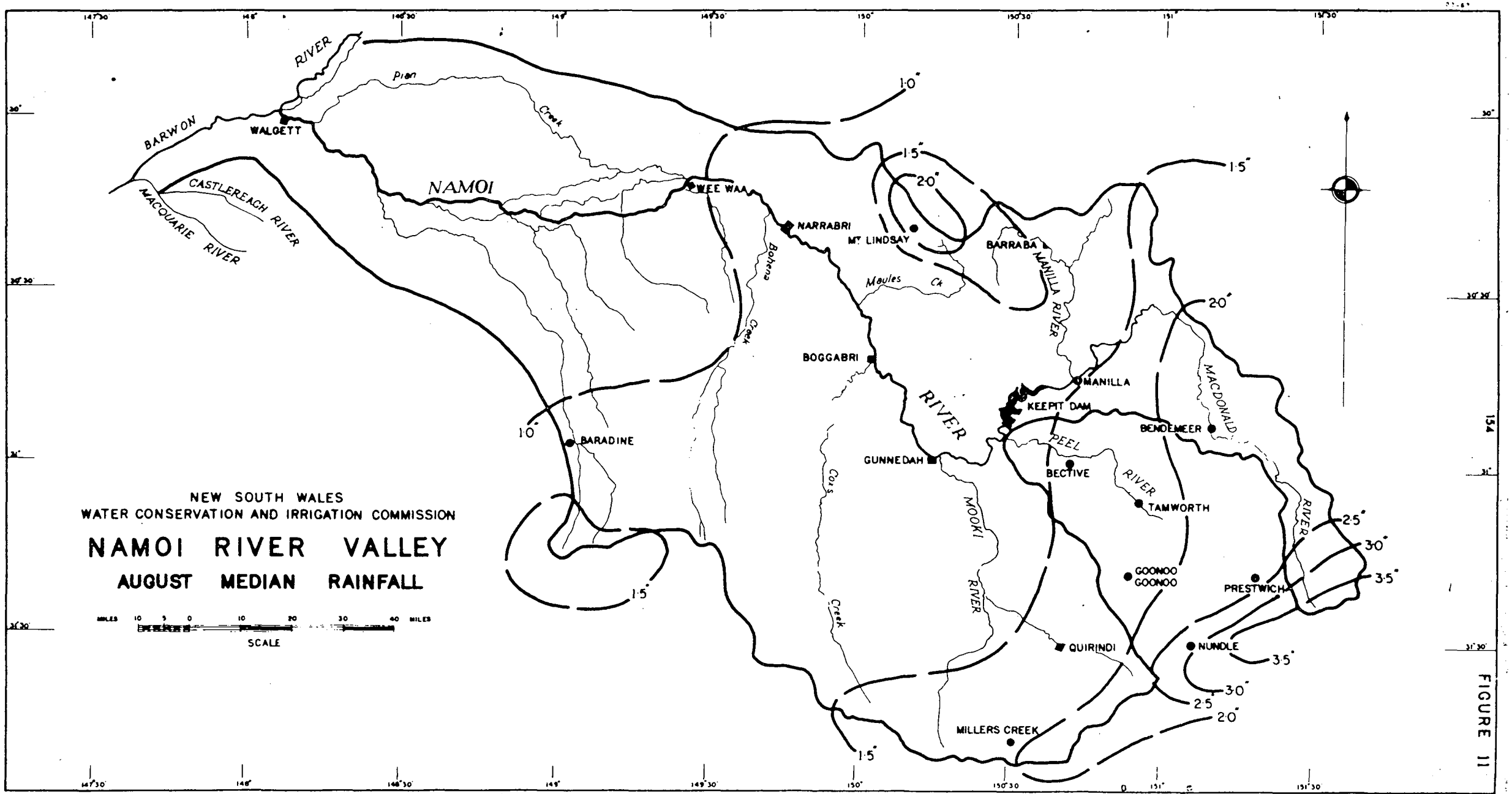

NEW SOUTH WALES
WATER CONSERVATION AND IRRIGATION COMMISSION
NAMOI RIVER VALLEY
AUGUST MEDIAN RAINFALL
SCALE
MILES
NAMOI
RIVER
BARWON
WALGETT
CASTLEREAGH RIVER
MACQUARIE RIVER
Pian
Creek
WEE WAA
NARRABRI
MT. LINDSAY
BARRABA
MANILLA RIVER
Maules Ck
Bohena Creek
BOGGABRI
MANILLA
KEEPIT DAM
RIVER
MACDONALD
BENDEMEER
PEEL
RIVER
BECTIVE
TAMWORTH
BARADINE
GUNNEDAH
Cox's Creek
MOOKI RIVER
GOONOO GOONOO
PRESTWICH
RIVER
QUIRINDI
NUNDLE
MILLERS CREEK
1·0"
1·5"
2·0"
2·5"
3·0"
3·5"

FIGURE 11

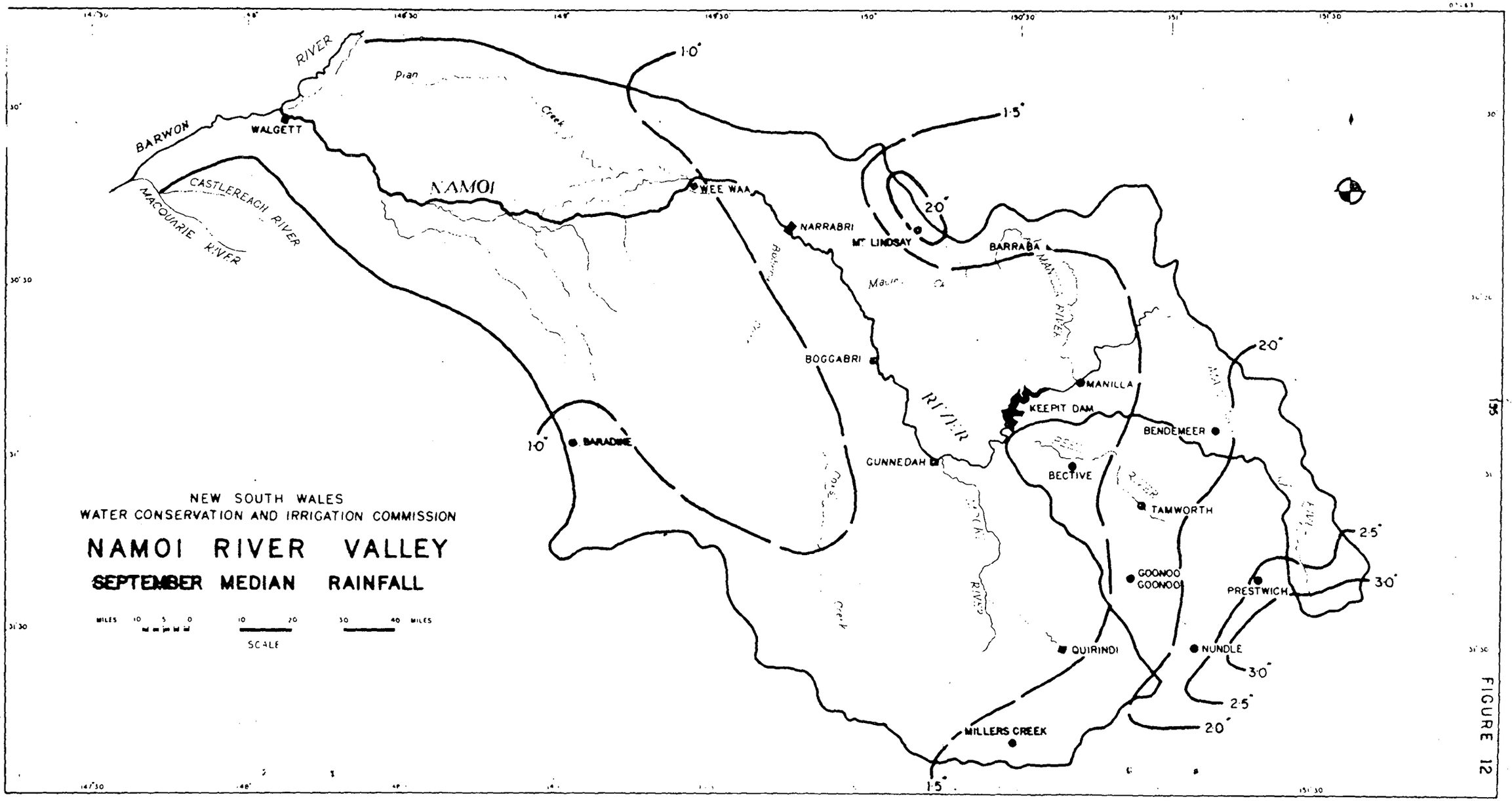

NEW SOUTH WALES
WATER CONSERVATION AND IRRIGATION COMMISSION
NAMOI RIVER VALLEY
SEPTEMBER MEDIAN RAINFALL
MILES 10 5 0 10 20 30 40 MILES
SCALE
BARWON RIVER
WALGETT
CASTLEREAGH RIVER
MACQUARIE RIVER
NAMOI
Pian Creek
WEE WAA
NARRABRI
Mt LINDSAY
BARRABA
MANILLA RIVER
BOGGABRI
KEEPIT DAM
MANILLA
BENDEMEER
GUNNEDAH
BECTIVE
TAMWORTH
GOONOO GOONOO
PRESTWICH
QUIRINDI
NUNDLE
MILLERS CREEK
BARADINE
1·0"
1·5"
2·0"
2·5"
3·0"

FIGURE 12

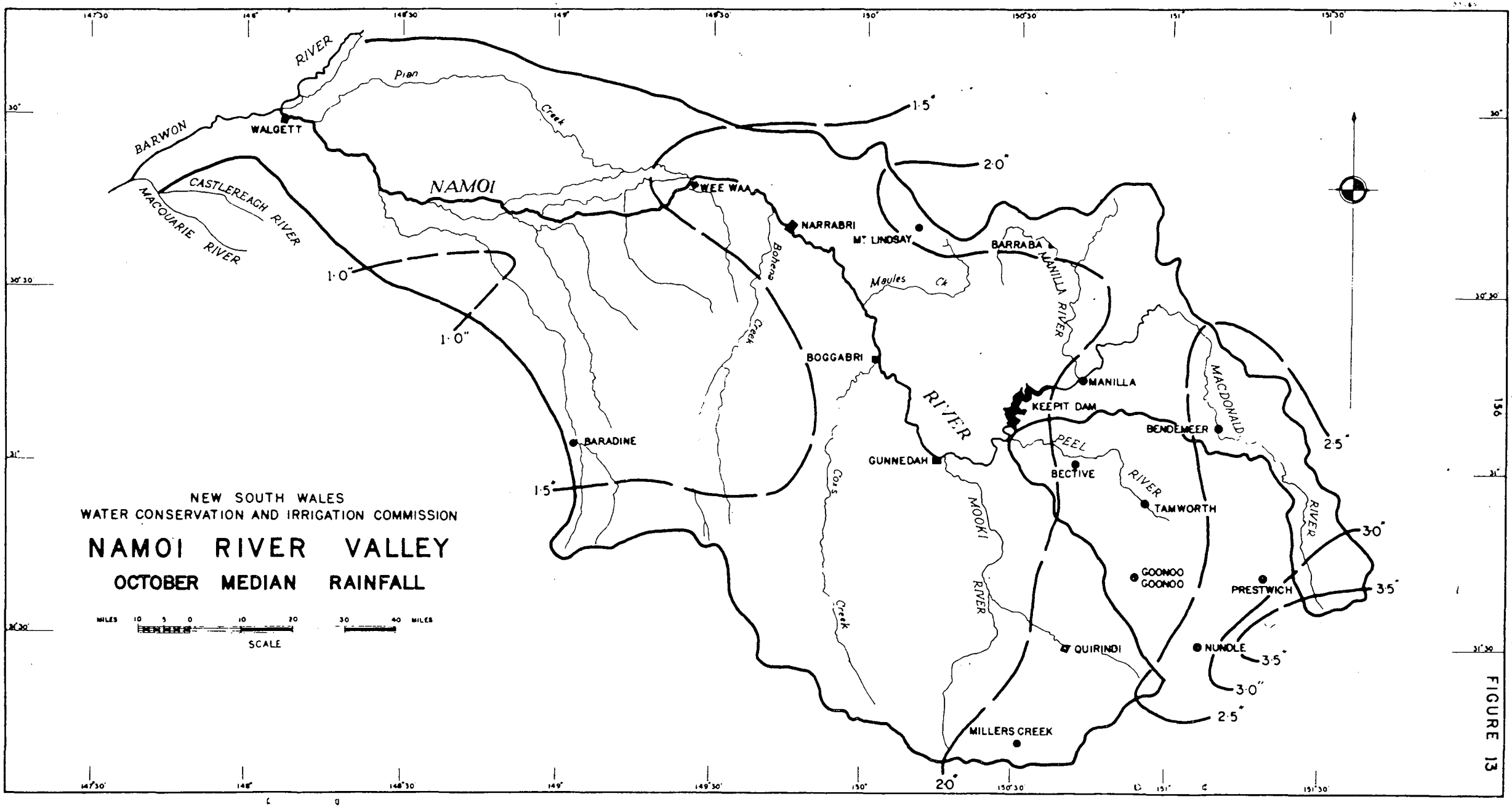

NEW SOUTH WALES
WATER CONSERVATION AND IRRIGATION COMMISSION
NAMOI RIVER VALLEY
OCTOBER MEDIAN RAINFALL
SCALE
MILES
NAMOI
RIVER
BARWON
CASTLEREAGH RIVER
MACQUARIE RIVER
Pian Creek
Bohena Creek
Mooki Creek
Cox's Creek
Maules Ck
MANILLA RIVER
MACDONALD RIVER
PEEL RIVER
MOOKI RIVER
WALGETT
WEE WAA
NARRABRI
Mt LINDSAY
BARRABA
BOGGABRI
MANILLA
KEEPIT DAM
BENDEMEER
BECTIVE
TAMWORTH
GUNNEDAH
BARADINE
GOONOO GOONOO
PRESTWICH
QUIRINDI
NUNDLE
MILLERS CREEK
1·0"
1·5"
2·0"
2·5"
3·0"
3·5"

FIGURE 13

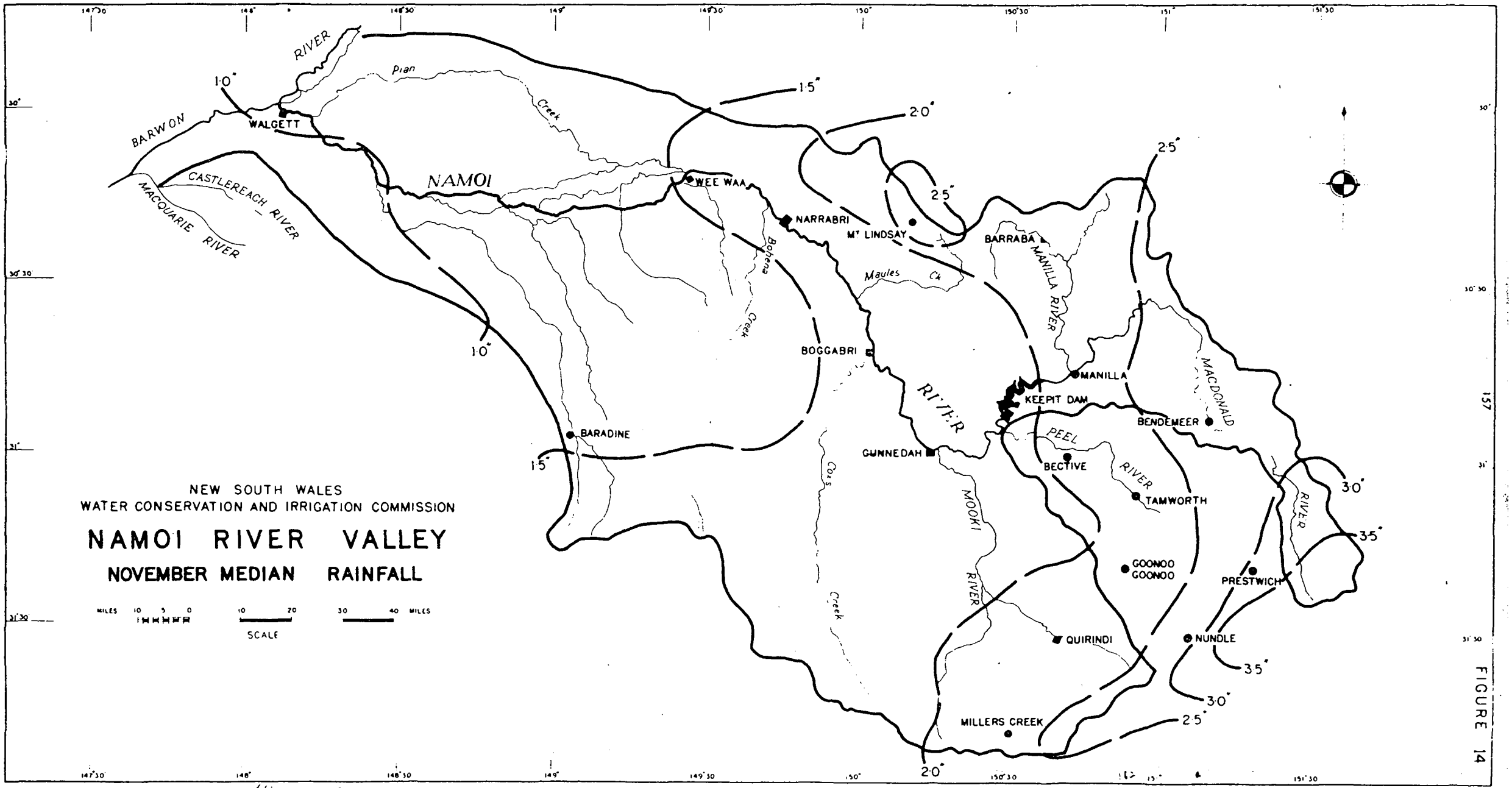


FIGURE 14

157

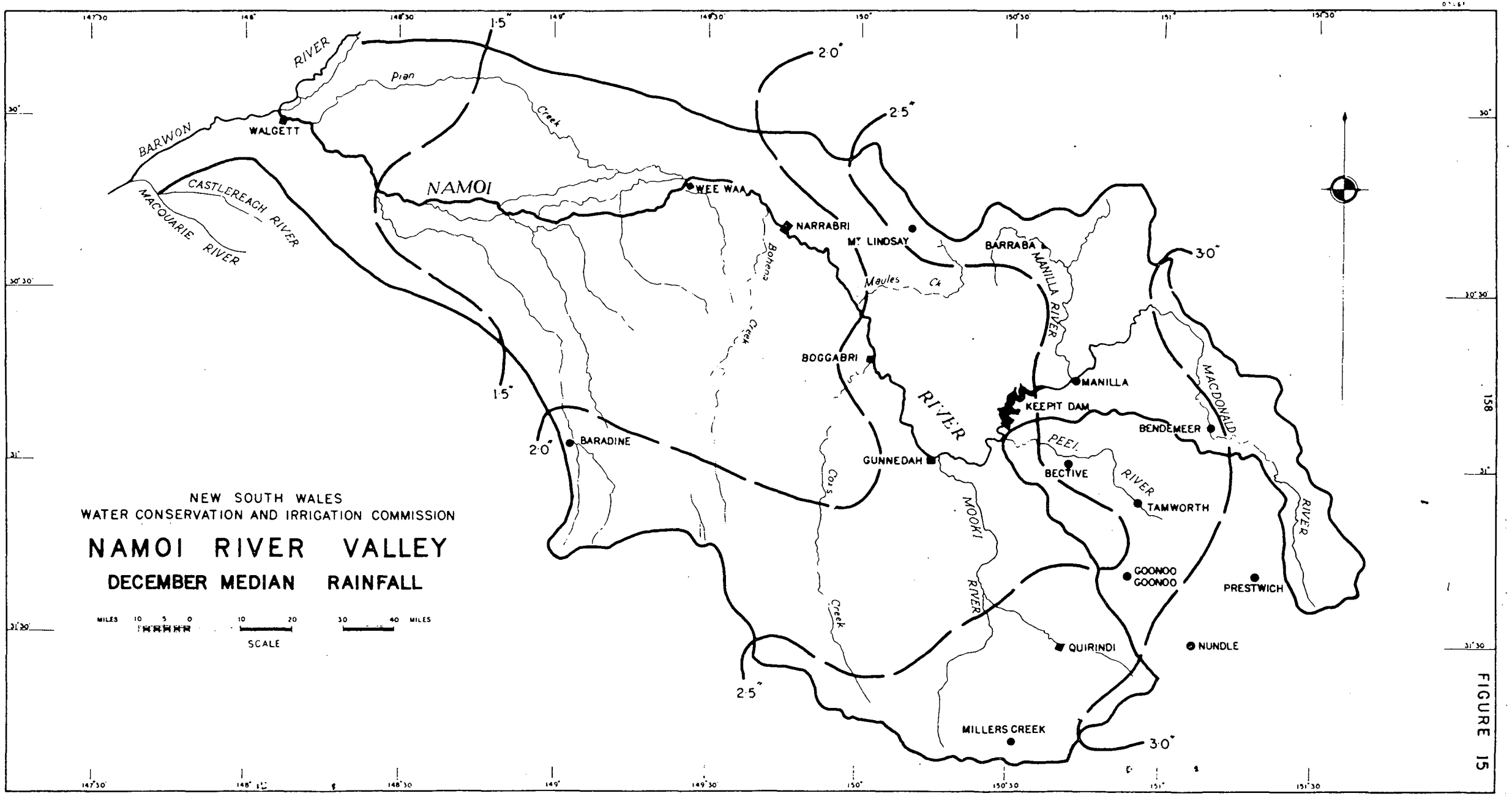

NEW SOUTH WALES
WATER CONSERVATION AND IRRIGATION COMMISSION
NAMOI RIVER VALLEY
DECEMBER MEDIAN RAINFALL
MILES 10 5 0 10 20 30 40 MILES
SCALE
BARWON RIVER
WALGETT
Pian Creek
NAMOI
CASTLEREAGH RIVER
MACQUARIE RIVER
WEE WAA
NARRABRI
Mt LINDSAY
Maules Ck
Bohena Creek
BOGGABRI
BARRABA
MANILLA RIVER
MANILLA
KEEPIT DAM
RIVER
PEEL RIVER
BENDEMEER
MACDONALD RIVER
BECTIVE
TAMWORTH
GUNNEDAH
BARADINE
Cox's Creek
MOOKI RIVER
GOONOO GOONOO
PRESTWICH
QUIRINDI
NUNDLE
MILLERS CREEK
1·5"
2·0"
2·5"
3·0"
147°30' 148° 148°30' 149° 149°30' 150° 150°30' 151° 151°30'
30' 30°30' 31° 31°30'

FIGURE 15

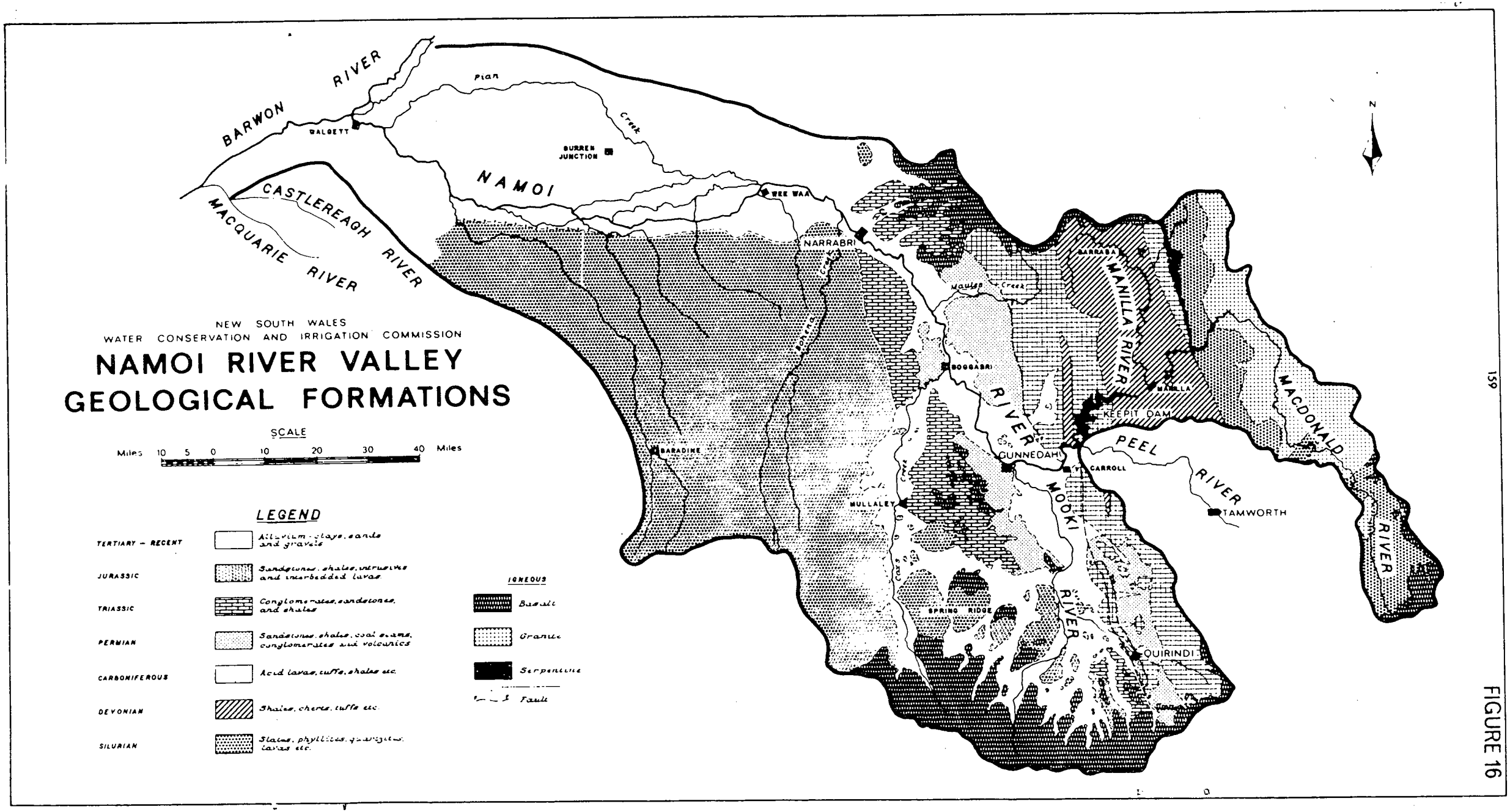

NEW SOUTH WALES
WATER CONSERVATION AND IRRIGATION COMMISSION
NAMOI RIVER VALLEY
GEOLOGICAL FORMATIONS
SCALE
Miles 10 5 0 10 20 30 40 Miles
LEGEND
TERTIARY – RECENT
Alluvium - clays, sands and gravels
JURASSIC
Sandstones, shales, intrusives and interbedded lavas.
TRIASSIC
Conglomerates, sandstones, and shales
PERMIAN
Sandstones, shales, coal seams, conglomerates and volcanics
CARBONIFEROUS
Acid lavas, tuffs, shales etc.
DEVONIAN
Shales, cherts, tuffs etc.
SILURIAN
Slates, phyllites, quartzites, lavas etc.
IGNEOUS
Basalt
Granite
Serpentine
Fault
BARWON RIVER
BALGETT
Pian
Creek
BURREN JUNCTION
NAMOI
CASTLEREAGH RIVER
MACQUARIE RIVER
WEE WAA
NARRABRI
Boggabri Creek
BOGGABRI
Mooki Creek
BARADINE
MULLALEY
SPRING RIDGE
RIVER
MOOKI
GUNNEDAH
CARROLL
QUIRINDI
TAMWORTH
PEEL
RIVER
KEEPIT DAM
MANILLA
BARRABA
MANILLA RIVER
MACDONALD
RIVER
N

FIGURE 16

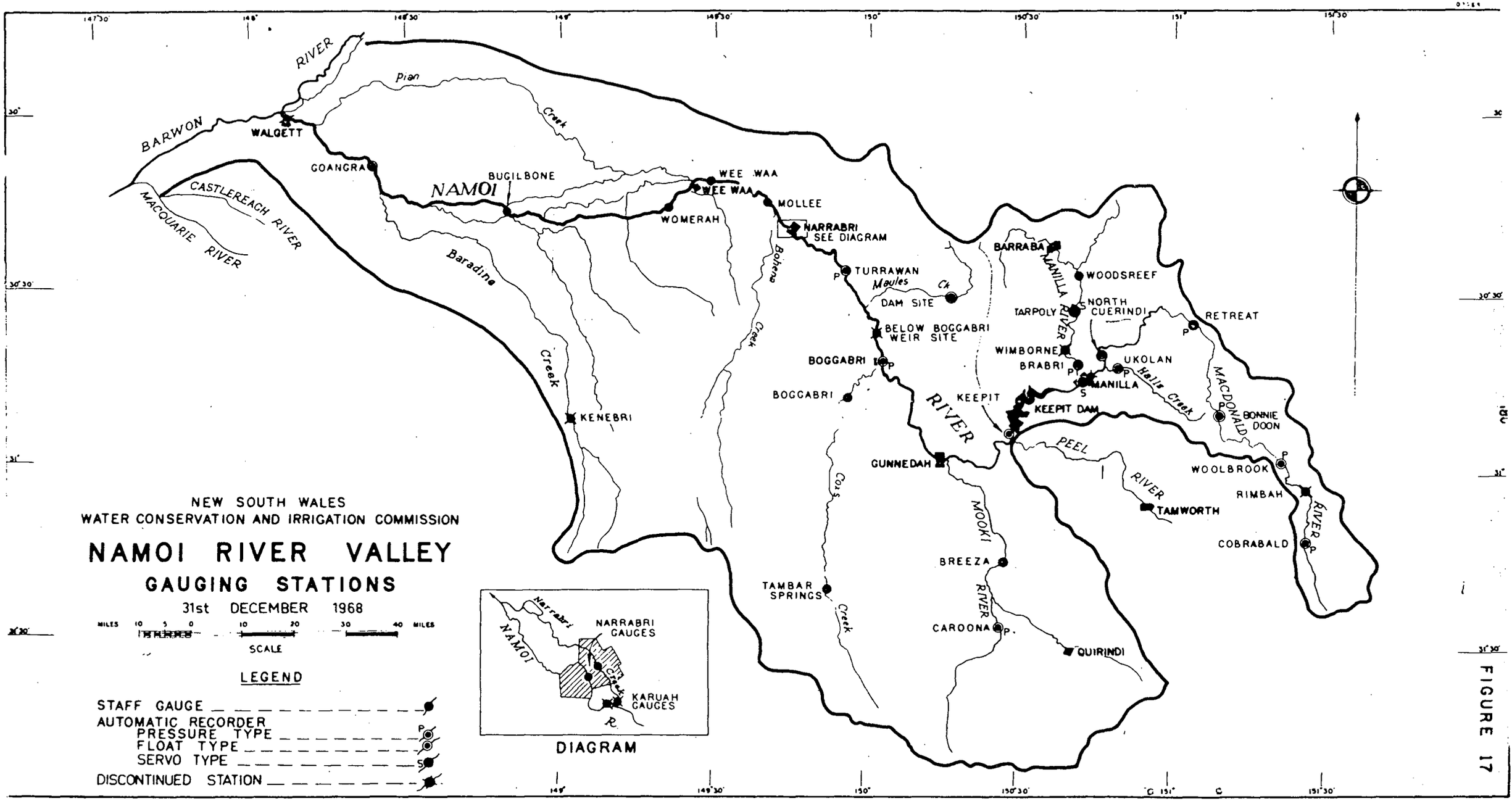
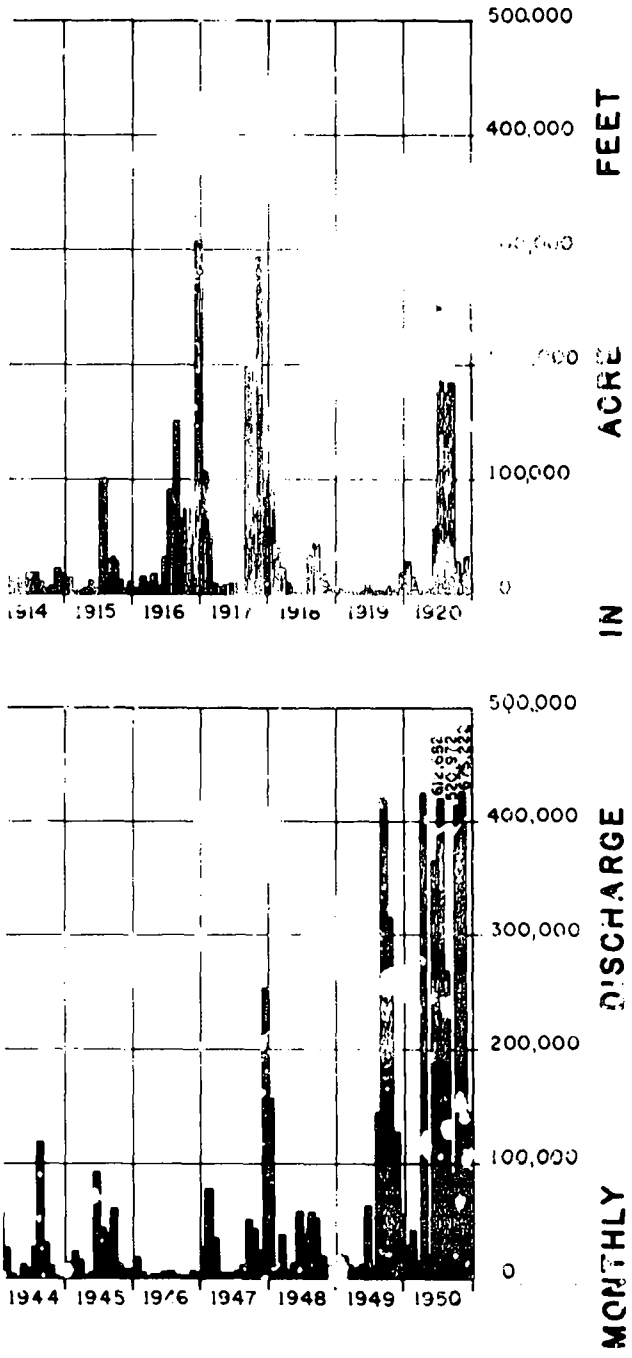

NEW SOUTH WALES
WATER CONSERVATION AND IRRIGATION COMMISSION
NAMOI RIVER VALLEY
GAUGING STATIONS
31st DECEMBER 1968
MILES 10 5 0 10 20 30 40 MILES
SCALE
LEGEND
STAFF GAUGE
AUTOMATIC RECORDER
PRESSURE TYPE
FLOAT TYPE
SERVO TYPE
DISCONTINUED STATION
DIAGRAM
NARRABRI GAUGES
KARUAH GAUGES
NAMOI
Narrabri
Creek
R.
BARWON RIVER
WALGETT
GOANGRA
BUGILBONE
NAMOI
Pian
Creek
WEE WAA
WEE WAA
MOLLEE
WOMERAH
NARRABRI
SEE DIAGRAM
Bohena
Creek
TURRAWAN
Maules
Ck
DAM SITE
BELOW BOGGABRI
WEIR SITE
BOGGABRI
BOGGABRI
CASTLEREAGH RIVER
MACQUARIE RIVER
Baradine
Creek
KENEBRI
BARRABA
MANILLA RIVER
WOODSREEF
TARPOLY
NORTH
CUERINDI
RETREAT
WIMBORNE
BRABRI
UKOLAN
MANILLA
Halls Creek
MACDONALD
BONNIE
DOON
KEEPIT
KEEPIT DAM
RIVER
PEEL
RIVER
WOOLBROOK
RIMBAH
TAMWORTH
RIVER
COBRABALD
GUNNEDAH
Cox's
MOOKI
RIVER
BREEZA
TAMBAR
SPRINGS
Creek
CAROONA
QUIRINDI

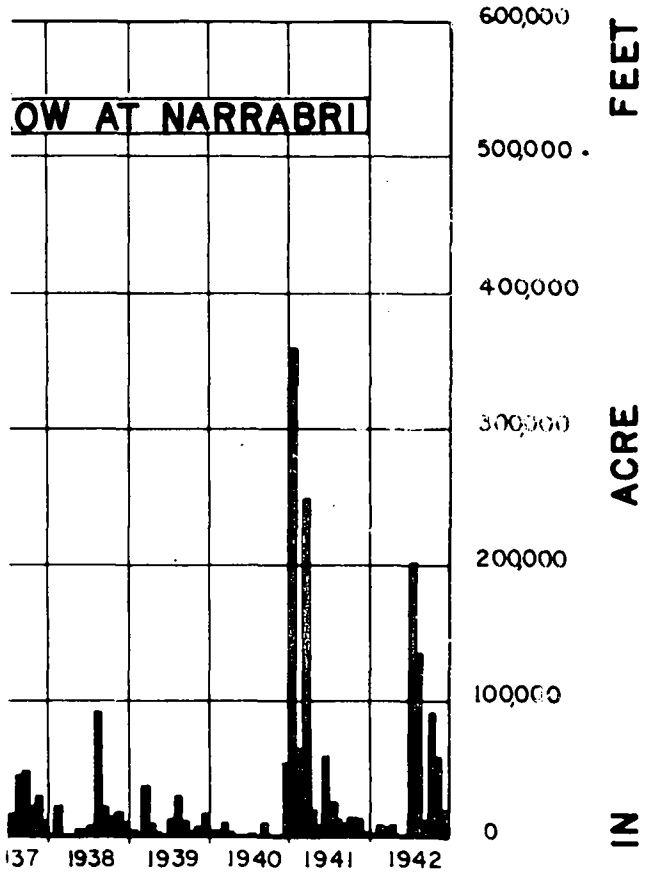
FIGURE 17

FIGURE 18



HYDROGRAPH OF
MONTHLY DISCHARGES
FOR NAMOI RIVER
AT GUNNEDAH

FIGURE 19


OW AT NARRABRI
600,000
500,000
400,000
300,000
200,000
100,000
0
FEET
ACRE
IN
37
1938
1939
1940
1941
1942

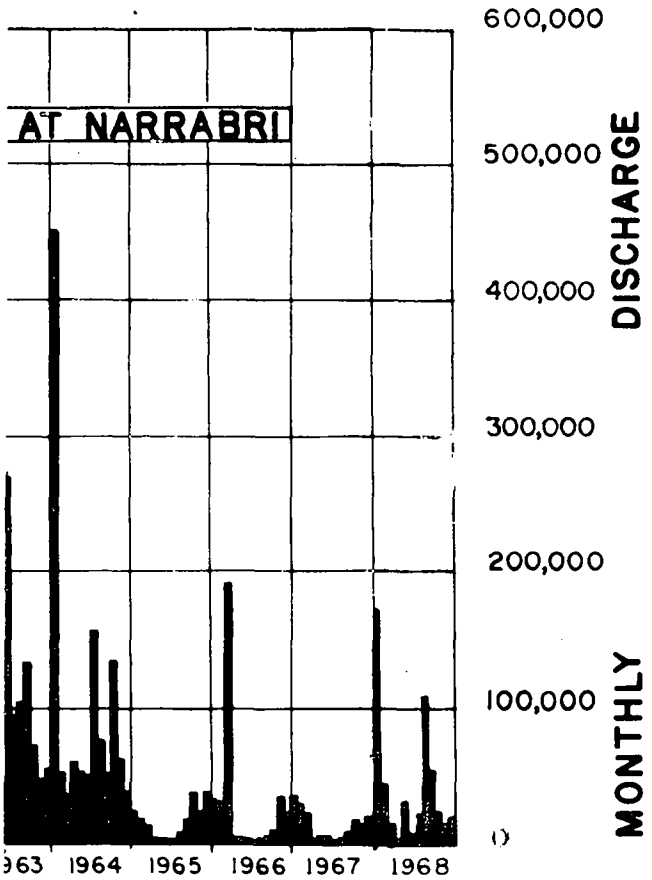
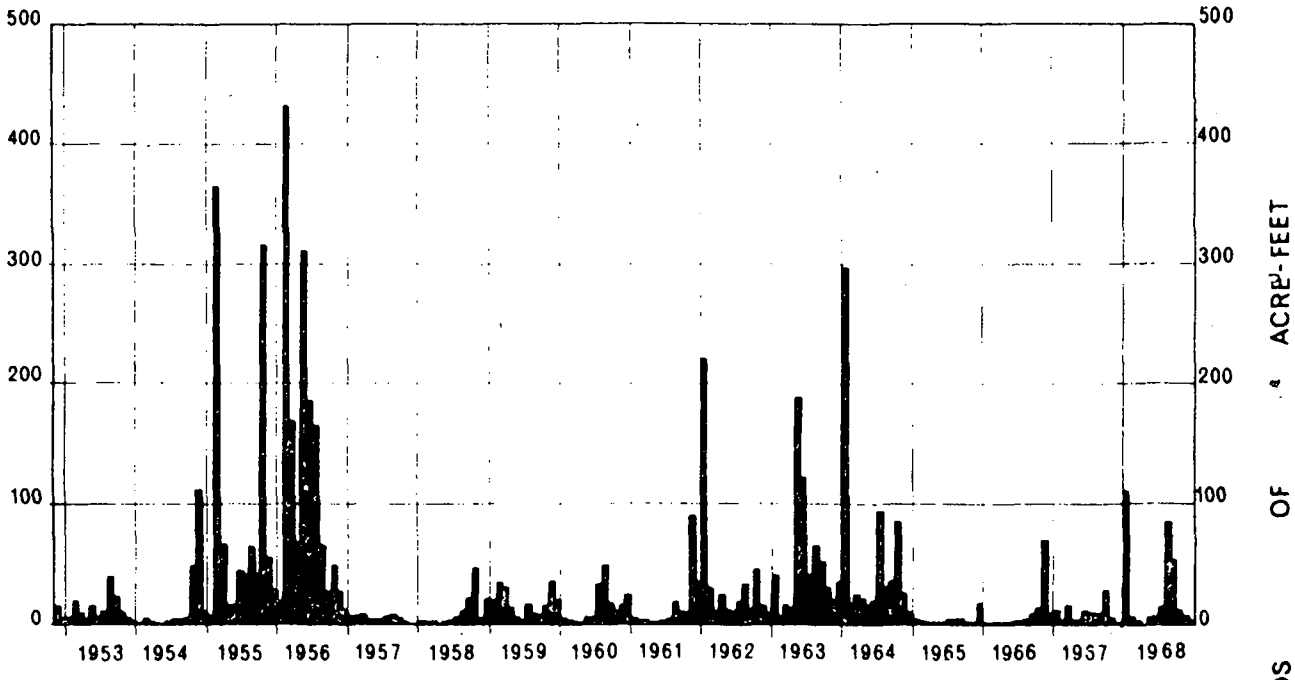
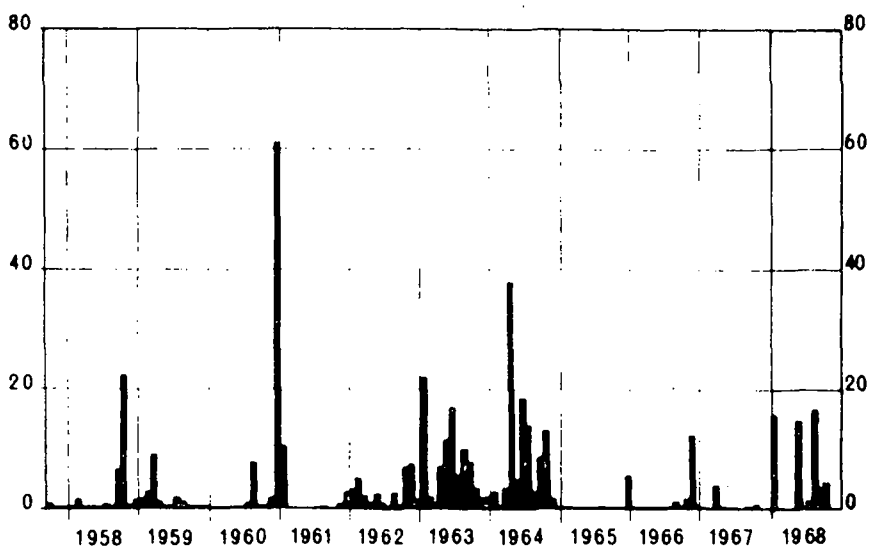

AT NARRABRI
600,000
500,000
400,000
300,000
200,000
100,000
0
DISCHARGE
MONTHLY
963
1964
1965
1966
1967
1968

FIGURE 20

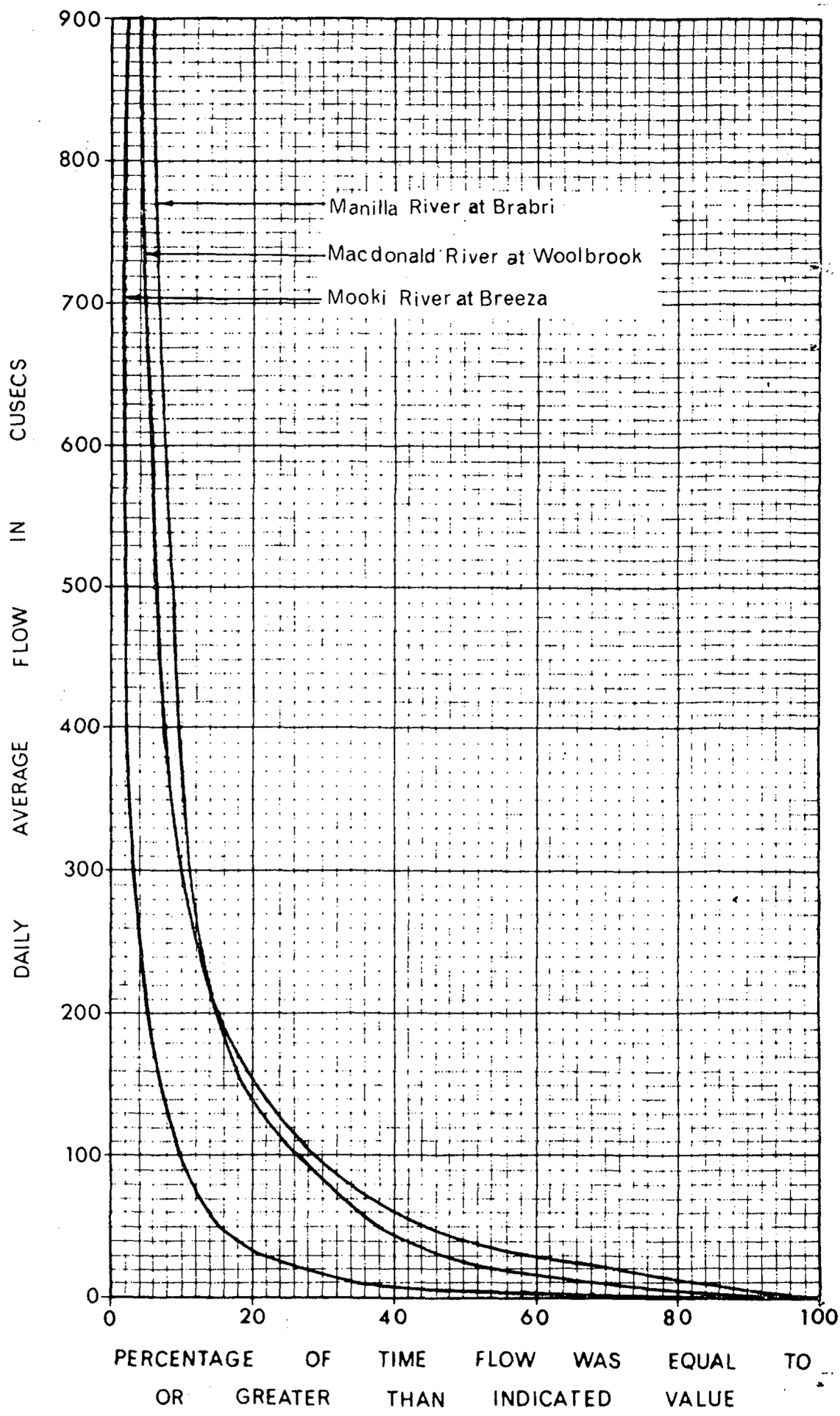


HYDROGRAPH OF MONTHLY DISCHARGES FOR NAMOI RIVER AT MANILLA RAILWAY BRIDGE



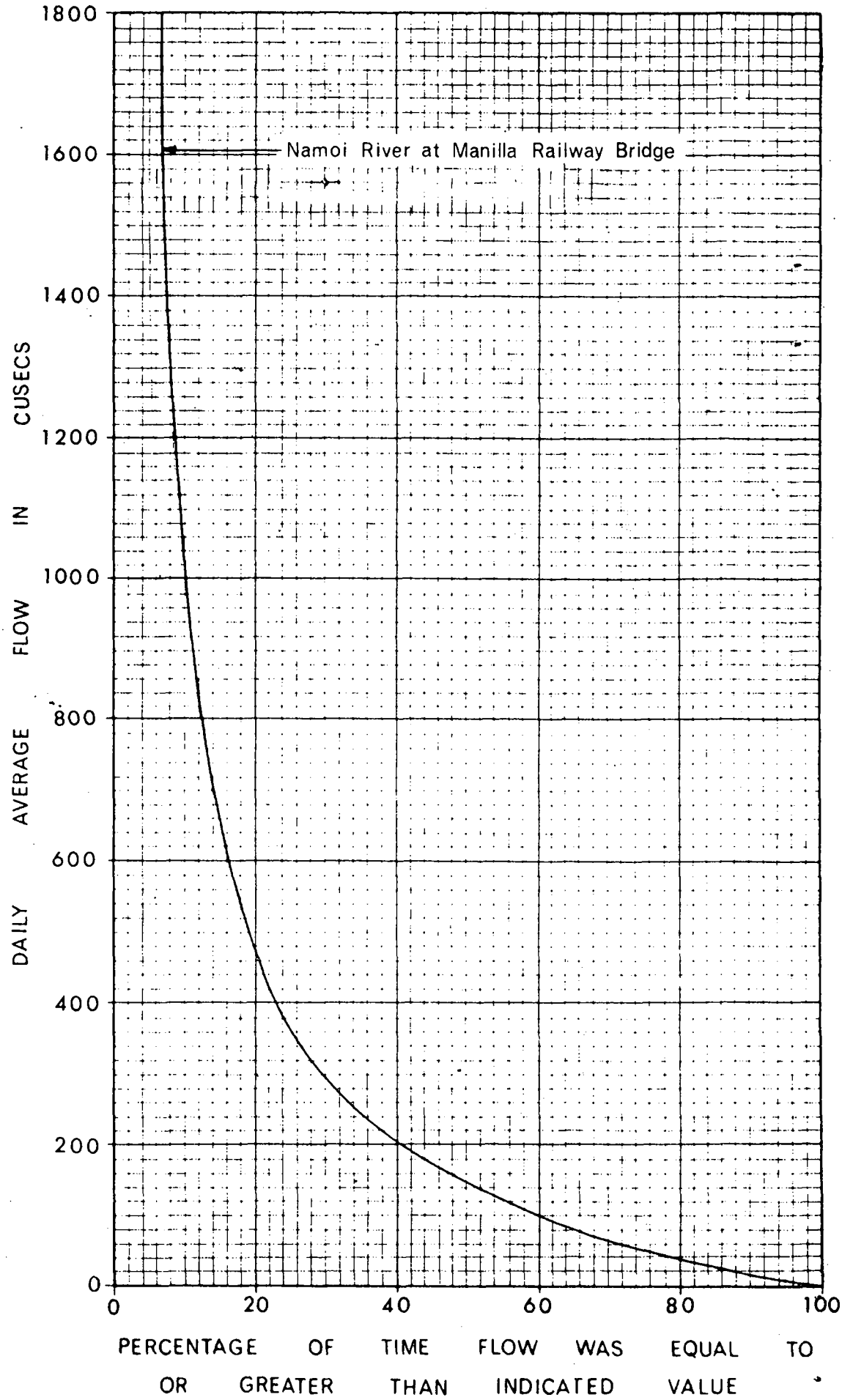
HYDROGRAPH OF MONTHLY DISCHARGES FOR MOOKI RIVER AT BREEZA

FIGURE 21



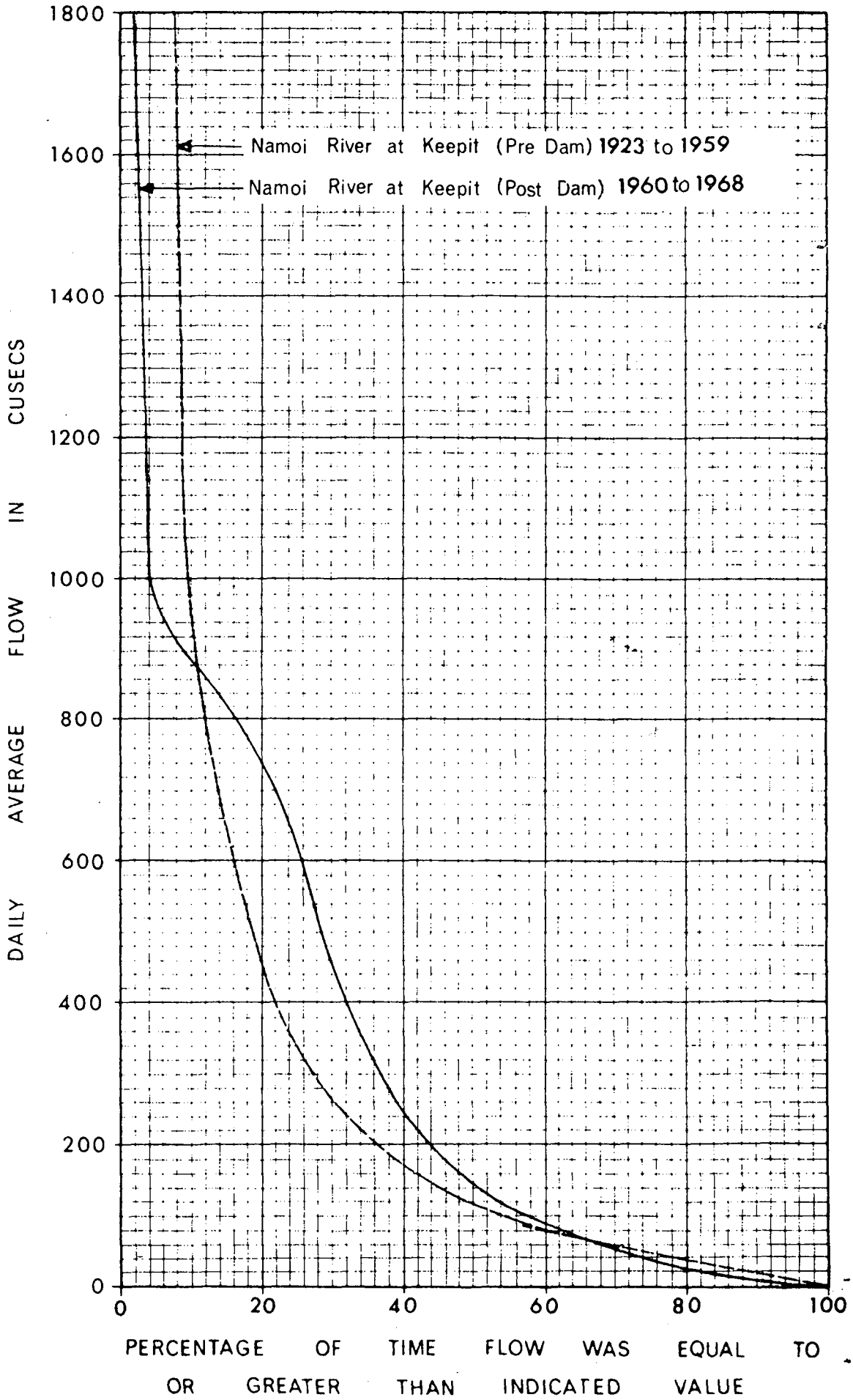
FLOW DURATION CURVES FOR MANILLA RIVER AT BRABRI, MACDONALD RIVER AT WOOLBROOK AND MOOKI RIVER AT BREEZA

FIGURE 22



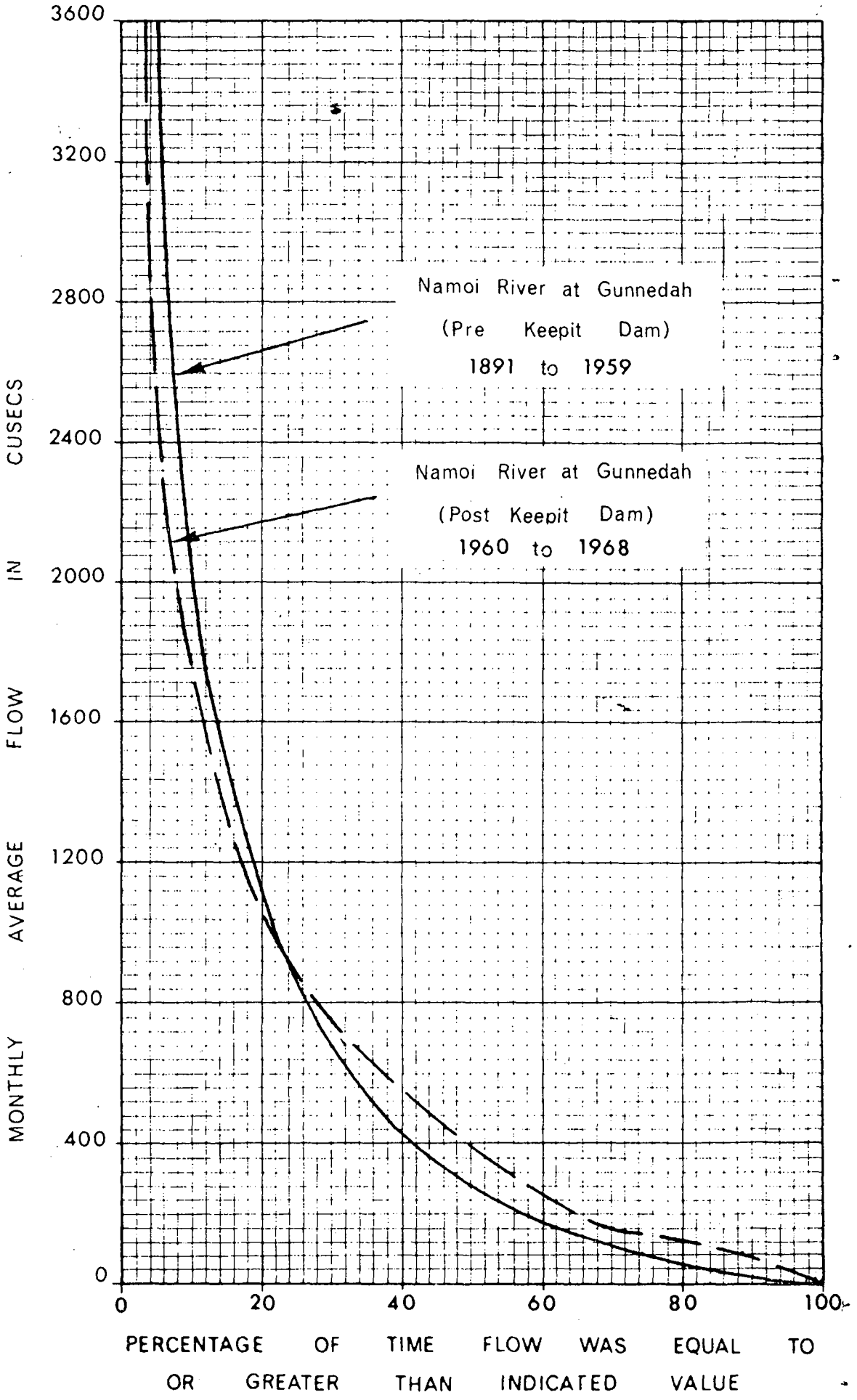
FLOW DURATION CURVE FOR NAMOI RIVER AT MANILLA RAILWAY BRIDGE

FIGURE 23



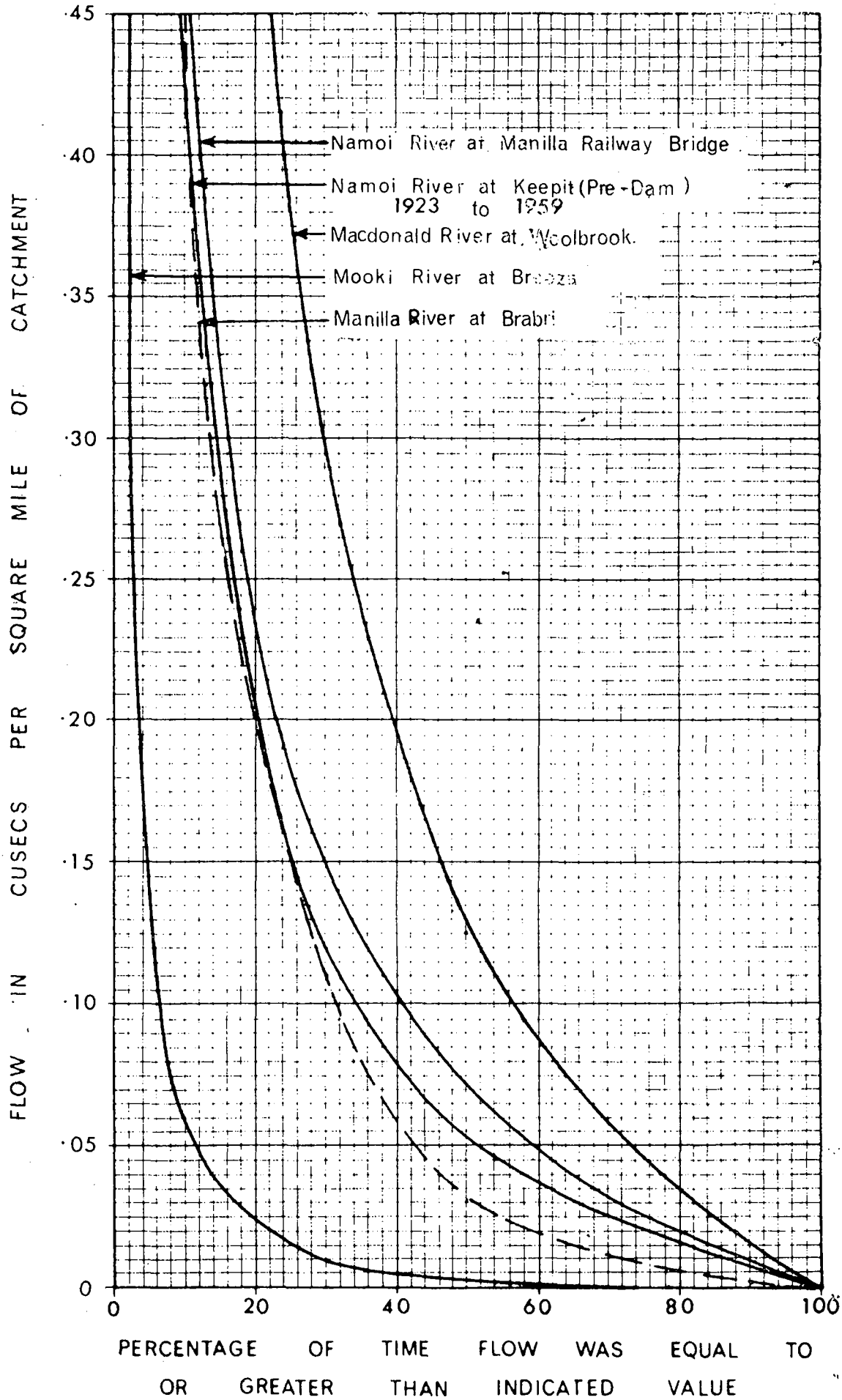
FLOW DURATION CURVES FOR NAMOI RIVER AT KEEPIT

FIGURE 24

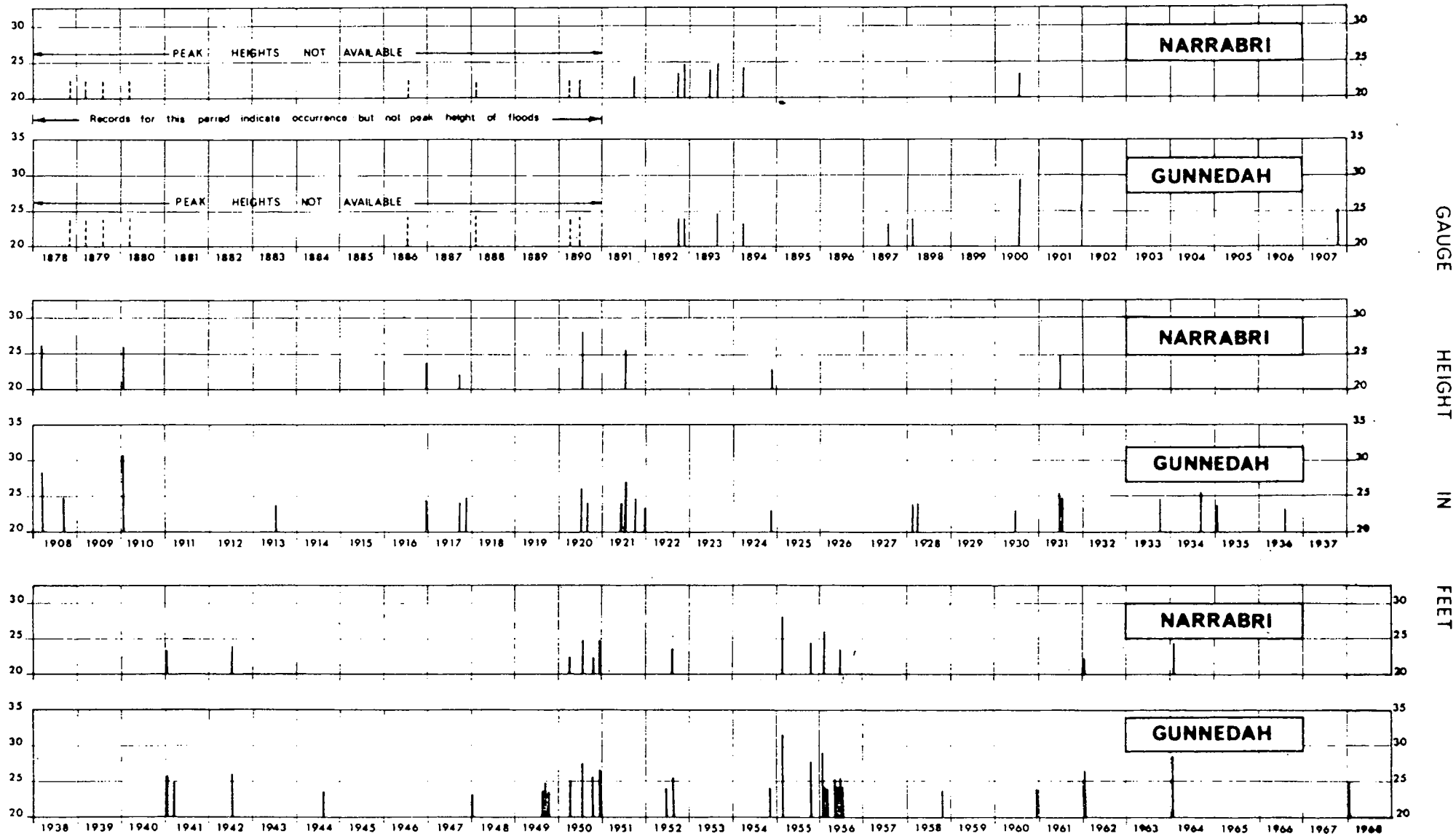


FLOW DURATION CURVES FOR NAMOI RIVER AT GUNNEDAH

FIGURE 25

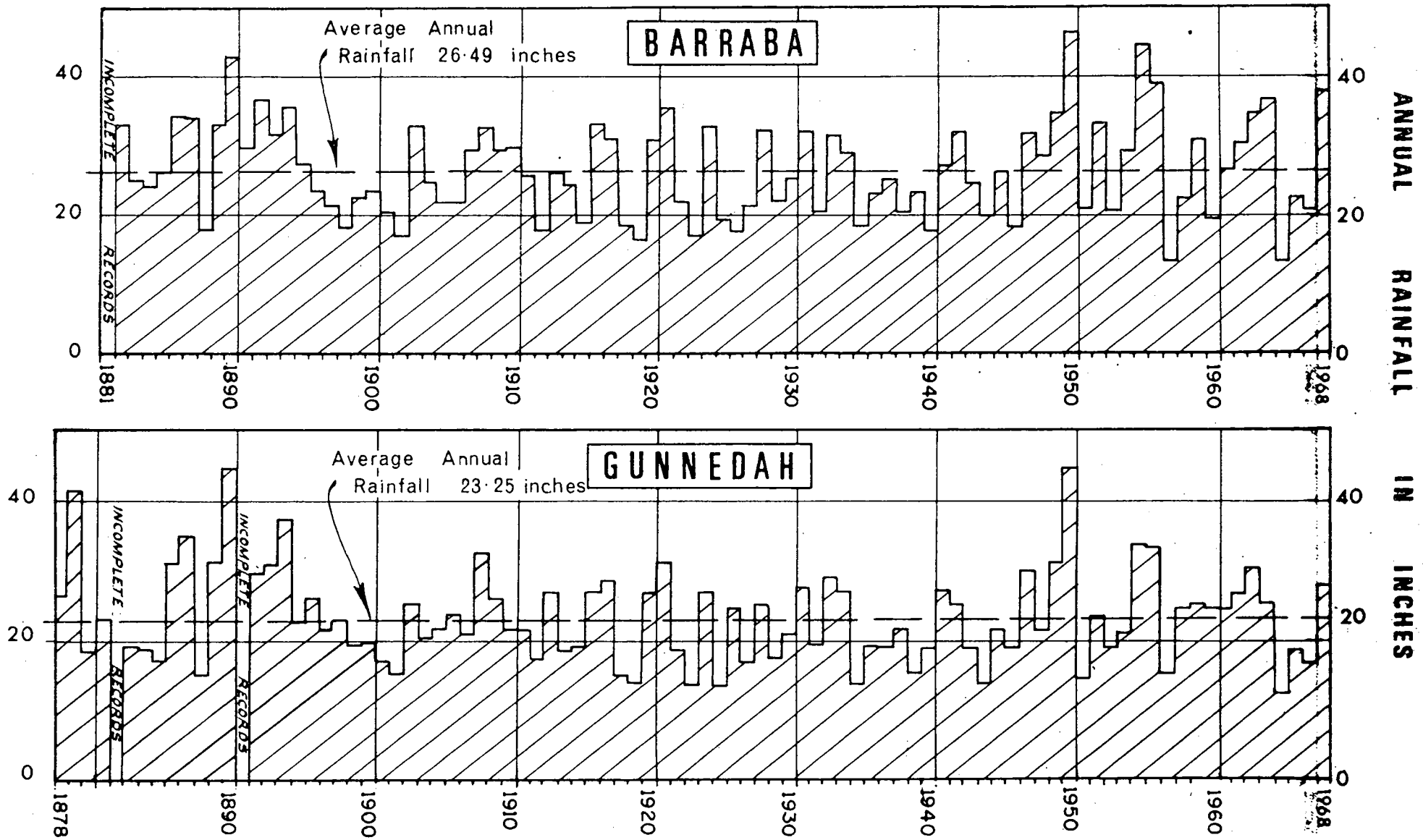


FLOW DURATION CURVES FOR SELECTED GAUGING STATIONS IN NAMOI VALLEY



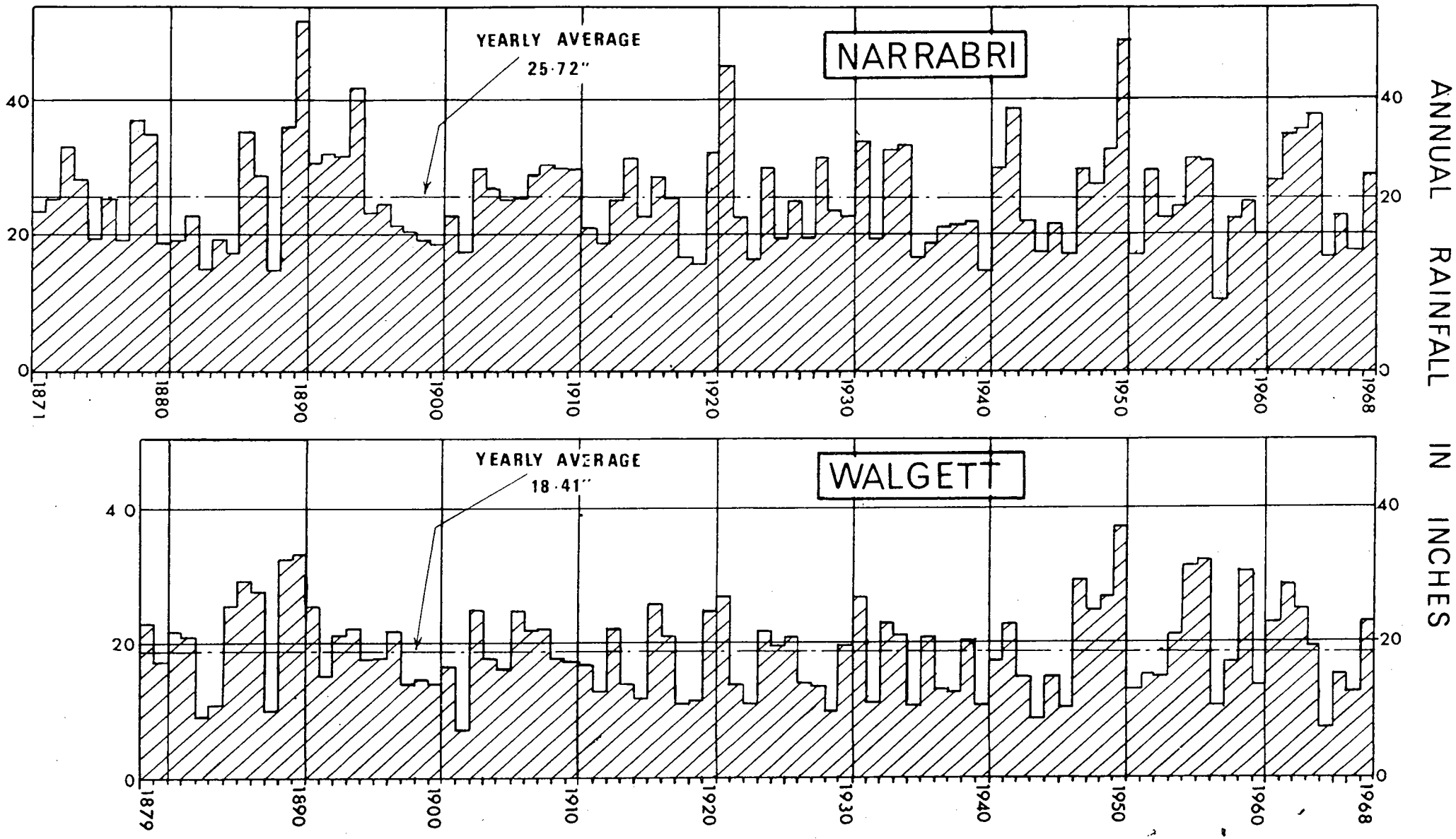
FLOOD PEAKS EXCEEDING 23 FEET AT GUNNEDAH AND 22 FEET AT NARRABRI

FIGURE 26



ANNUAL RAINFALLS AT BARRABA & GUNNEDAH.

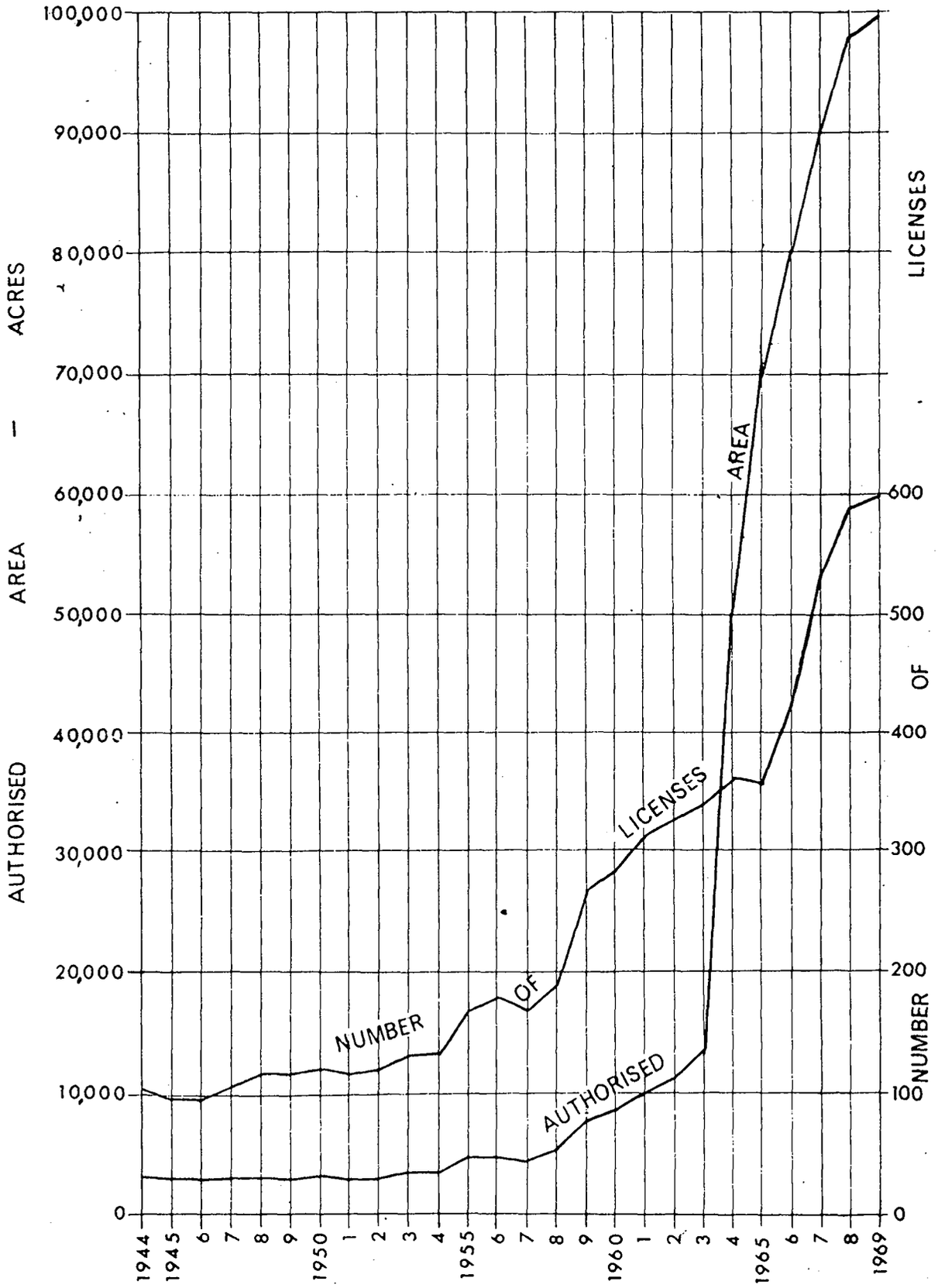
Figure 27



ANNUAL RAINFALLS AT NARRABRI AND WALGETT

FIGURE 28

FIGURE 29



NAMOI VALLEY

AREA AUTHORISED FOR IRRIGATION AND TOTAL NUMBER OF LICENSES AT 30TH JUNE FOR EACH YEAR INDICATED

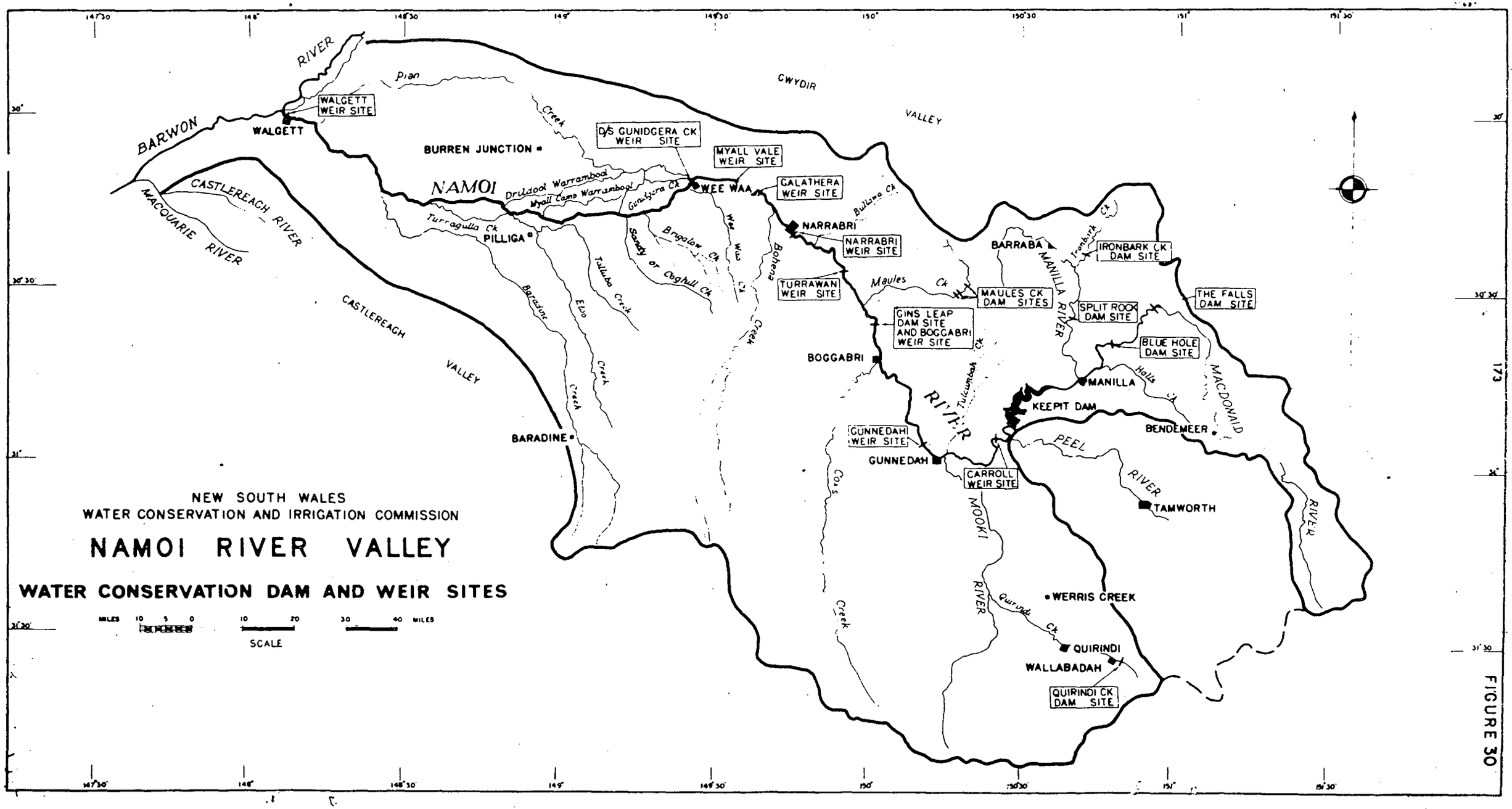

NEW SOUTH WALES
WATER CONSERVATION AND IRRIGATION COMMISSION
NAMOI RIVER VALLEY
WATER CONSERVATION DAM AND WEIR SITES
SCALE
MILES 10 5 0 10 20 30 40 MILES
BARWON RIVER
WALGETT
WALGETT WEIR SITE
BURREN JUNCTION
NAMOI
CASTLEREAGH RIVER
MACQUARIE RIVER
CASTLEREAGH VALLEY
BARADINE
PILLIGA
Pian Creek
Turragulla Ck
Baradine Creek
Eulo Creek
Talluba Creek
Sandy or Coghill Ck
Bugalow Ck
Wee Waa Ck
Bohena Creek
Cows Creek
D/S GUNIDGERA CK WEIR SITE
MYALL VALE WEIR SITE
WEE WAA
GALATHERA WEIR SITE
NARRABRI
NARRABRI WEIR SITE
TURRAWAN WEIR SITE
BOGGABRI
GINS LEAP DAM SITE AND BOGGABRI WEIR SITE
GUNNEDAH WEIR SITE
GUNNEDAH
CARROLL WEIR SITE
CWYDIR VALLEY
Bullawa Ck
Maules Ck
MAULES CK DAM SITES
BARRABA
MANILLA RIVER
Ironbark Ck
IRONBARK CK DAM SITE
SPLIT ROCK DAM SITE
THE FALLS DAM SITE
BLUE HOLE DAM SITE
MANILLA
KEEPIT DAM
Halls Ck
MACDONALD RIVER
BENDEMEER
PEEL RIVER
TAMWORTH
MOOKI RIVER
Tukumbah Ck
Quirindi Ck
WERRIS CREEK
QUIRINDI
WALLABADAH
QUIRINDI CK DAM SITE
147°30' 148° 148°30' 149° 149°30' 150° 150°30' 151° 151°30'
30° 30°30' 31° 31°30'

FIGURE 30