Chapter 3

Groundwater Allocation and Management Issues – Pioneer Valley

3.1 Introduction

Under the *Water Act 2000*, the Minister is required to report on the water allocation and sustainable management issues in the Plan area. This chapter discusses the economic, social and environmental issues identified to date for consideration during amendment of the Pioneer Valley Water Resource Plan. While the issues are believed to be comprehensive from a water resource planning viewpoint, they may not be complete. It is recognised that views on the best approach to allocating water and the uses to which it is put will be many and varied.

The WRP Planning process will ensure that social, economic and environmental issues are addressed and that:

- *water allocations support efficient use of water;*
- *the community's understanding of the need to allocate and manage water sustainably and efficiently continues to improve;*
- *indigenous people's links with land and water, and their traditions, customs and culture are recognised and provided for; and*
- *the community is actively engaged and consulted.*

This chapter provides an overview of the main water allocation and management issues and is intended to help stakeholders identify any new issues, or to expand on the issues already identified.

3.2 Background Factors

3.2.1 Rainfall and Catchment Runoff Characteristics

Hot, wet summers and dry, mild winters with temperatures ranging from a mean maximum of about 32 ºC to a mean minimum of 20 ºC are typical of the Mackay region. The Pioneer catchment is characterised by highly variable rainfall within the catchment and from year to year. Mean annual rainfall ranges from about 1 600 millimetres per annum (mm/a) at Mackay and in the coastal zone just south of Mackay, to more than 2 000 mm/a in the upper parts of the catchment of Cattle and Finch Hatton creeks. The Blacks Creek sub-catchment in the south-western part of the catchment receives an average of about 1 000 mm/a.

The marked dry season during autumn, winter and spring largely coincides with sugarcane planting and its early growing season. During this period irrigation demand is highest, reaching a peak in spring and early summer. Demand is highest in the dryer years such as 2001 – 2002 and lower in the wetter years (Figure 3a). More than three-quarters of average annual rainfall occurs between December and April.

The Pioneer Valley and adjacent Bakers, Sandy, Alligator and Sandringham creek catchments cover an area of some 2 423 square kilometres (km^2). The main streams of the catchment, namely the Pioneer River and the Cattle, Finch Hatton, Owens, Sandy, Bakers and McGregor creeks drain the alluvial and fractured rock aquifers. The alluvial aquifers occupy the valley floors and coastal

Factors that affect supply include:

- *short and long term rainfall and runoff patterns;*
- *aquifer characteristics;*
- *interaction between bores;*
- *effects of seawater intrusion;*
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floodplain while the fractured rock aquifers underlie the alluvium and occupy the elevated areas adjacent to the alluvial aquifers (Figure 4).

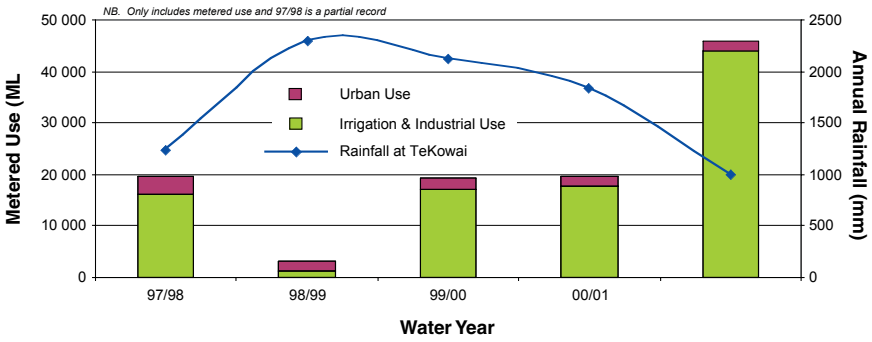

Figure 3a: Metered groundwater use versus rainfall

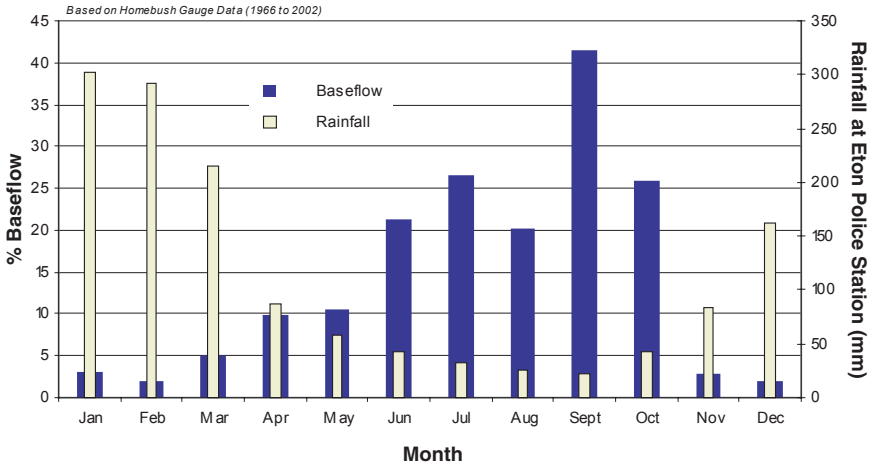

Figure 3b: Mean monthly baseflow for Sandy Creek at Homebush

It is estimated that the mean annual discharge of the area is about a million megalitres per annum (Brizga, 2001). The high seasonality of flows is demonstrated by figures showing that 56 per cent of mean annual flow occurs in summer and about a third in autumn (Brizga, 2001). Flows in the Pioneer River and Cattle Creek are perennial with the main tributaries having varying periods when flows do not occur.

The Pioneer River, Palm Tree, and parts of Cattle, Silver, Bakers and McGregor creeks are now supplemented from Teemburra Dam, so true baseflow conditions are masked. Sandy Creek is largely perennial although some sections do cease to flow and reduce to a series of waterholes during dry seasons. The low-flow seasons of winter and spring, and to a lesser extent autumn, largely depend on baseflow discharge from the fractured