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for information

**MARINE AND INLAND WATER QUALITY IN HONG KONG FOR 1993
AND BEACH WATER QUALITY FOR 1994**

INTRODUCTION

The purpose of this paper is to brief members on the status of Hong Kong's environmental waters including inland and coastal waters (status in 1993) and beach waters (status in 1994).

BACKGROUND

2. Comprehensive accounts of the quality of coastal waters, rivers and streams, and beach waters are summarized respectively in the following reports: "Marine Water Quality in Hong Kong for 1993", "River Water Quality in Hong Kong for 1993", and "Bacteriological Water Quality of Bathing Beaches in Hong Kong, 1994", copies of which are distributed with this paper.

Marine Waters

3. A comprehensive marine water quality monitoring programme was started in 1986. In 1993 the quality of seawater and bottom sediments was monitored at 80 seawater, 64 sediment and 21 typhoon shelter monitoring stations. At each sampling location, a range of physical, chemical and biological parameters are measured. The marine report reviews the seawater and bottom sediment quality for 1993 and gives the compliance with the key water quality objectives (WQOs) in the nine gazetted water control zones in existence in 1993.

Inland Waters

4. There are hundreds of streams, rivers and open nullahs in Hong Kong. Clearly, not all of these can be monitored all the time. In 1993, samples were collected from 86 sampling stations in 31 river systems. The status of the rivers is assessed by using a Water Quality Index which reflects the extent of organic, but not microbiological, pollution in the rivers. Using this system, rivers are classified as excellent, good, fair, bad and very bad.

Bathing Beaches

5. The bacteriological water quality of 42 gazetted beaches and 14 ungazetted beaches in the territory are monitored under the department's beach water quality monitoring programme. The status of the beaches is assessed through a grading system which links pollution level with swimming-associated health risks. Beaches are graded as good, fair, poor or very poor. Beaches in the "good" and "fair" category meet the relevant water quality objective. The annual ranks of these gazetted and ungazetted beaches are provided in the bathing beach report. The report also analyzes the bacteriological water quality trends of bathing beaches, and discusses the sources of pollution of beaches in various districts and the remedial actions required.

STATUS OF HONG KONG WATERS

Marine Waters

6. Marine water quality in Hong Kong generally showed no significant improvement during 1993. High turbidity and suspended solids levels, low dissolved oxygen concentration, high faecal coliform density and excessive nutrient concentration were still recorded in some marine areas. In 1993, there were 10 red tides reported, 9 less than in 1992. Tolo Harbour experienced a decrease in red tides with 3 blooms in 1993, compared with 9 in 1992. The bottom sediments in various areas were anoxic and contaminated with heavy metals and organic pollutants. A summary of the compliance with key water quality objectives for each of the water control zones in effect in 1993 is given in Figure 1.

7. Domestic sewage, livestock and industrial wastes continue to be the major pollution sources either by direct discharge into the sea or via the polluted watercourses that flow into it. In addition, in 1993, there were numerous infrastructure projects which involved large scale coastal reclamations, marine dredging and disposal at sea. These increased sea activities may also have had an effect on the marine environment.

Inland Waters

8. In 1993, 71.4% of the inland water monitoring stations were graded fair or above in terms of the Water Quality Index, an improvement over 1992 which showed a figure of 64.9%. These improvements in water quality can be ascribed mainly to the continued implementation and enforcement of the Water Pollution Control Ordinance and the reduction in the amount of livestock waste disposed of improperly. The control of chemical waste also contributed to the overall improvement, as has the provision of new or improved sewerage in the lower, urban areas of the stream catchments.

9. An assessment of the water quality of the monitored rivers in the declared water control zones indicates that two rivers, namely the Tai Po Kau Stream and Shan Liu Stream, showed full compliance with the stipulated water quality objectives for pH, suspended solids, dissolved oxygen, chemical oxygen demand and biochemical oxygen demand. For some rivers however, most notably the larger ones in the Deep Bay catchment, compliance with WQOs was very low. This was due to continuing severe organic pollution, principally by livestock waste.

10. Figure 2 summarises the compliance of Hong Kong's rivers with their WQOs and Figure 3 illustrates the overall improvement according to the water quality index.

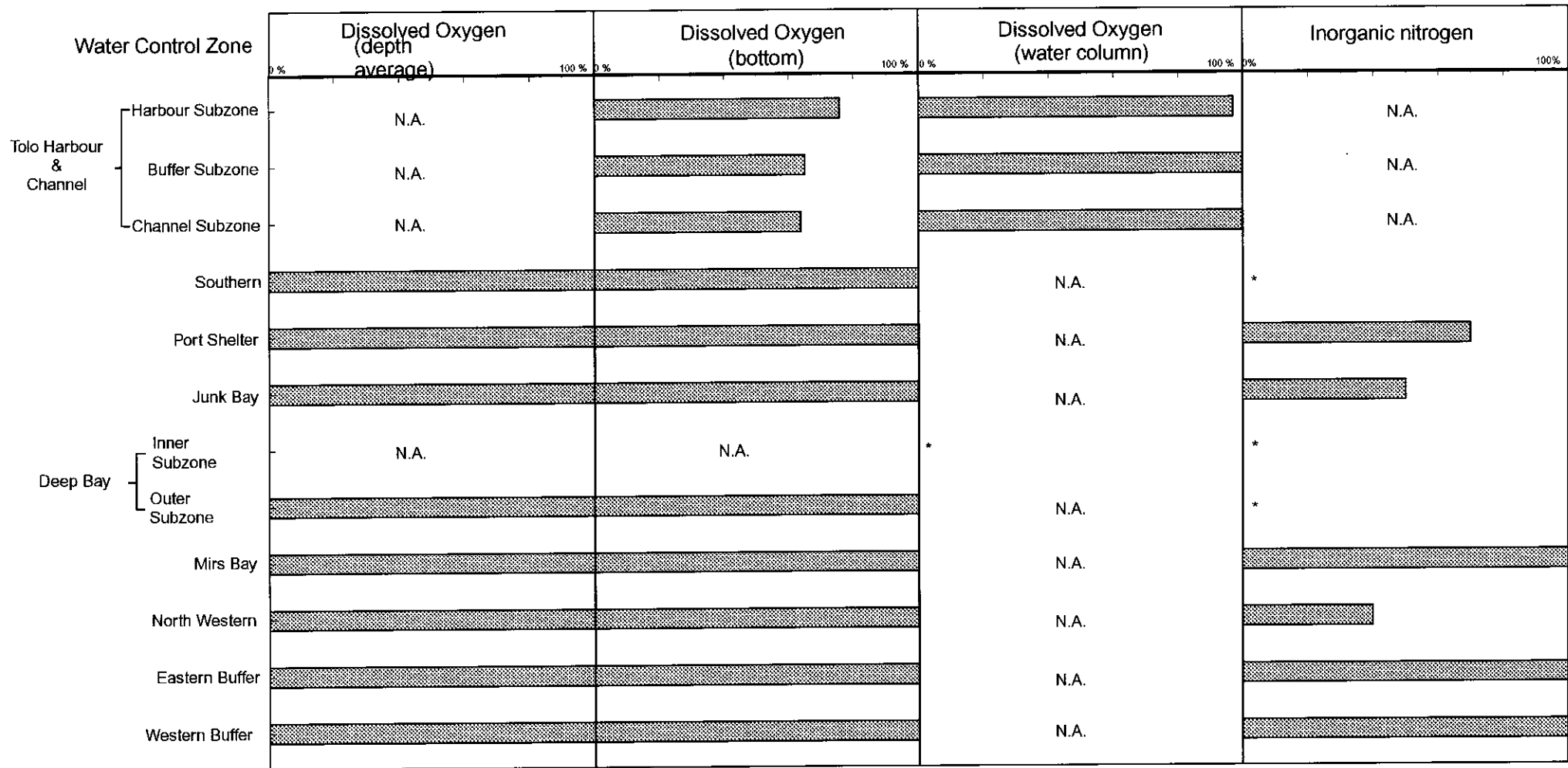
Bathing Beaches

11. In the 1994 bathing season, there were 15 gazetted beaches ranked good, 14 fair, 11 poor and 2 very poor. Figure 4 summarises the compliance of individual beaches with the water quality objective. The total numbers of beaches, gazetted and ungazetted, in different ranks over the last seven years is shown in Figure 5. The general momentum towards improvement in bacteriological beach water quality, built up in the 1980's, has stopped and there is now clear evidence of a deteriorating trend.

CONCLUSIONS

12. River water quality showed a slight improvement in 1993 compared with 1992, continuing the very clear trend which has been apparent for some time. For the first time, two rivers showed full compliance with all the stipulated objectives. Water quality in many areas is still very poor but with the progressive provision of more sewerage in unsewered areas, enforcement of the Water Pollution Control Ordinance, and implementation of the revised livestock waste control scheme, the progress seen in 1993 should continue in 1994 and beyond.

13. The first signs of improvement in marine water quality now seem to be apparent in Tolo Harbour. This trend should continue and extend to other water control zones as specific pollution reduction programmes progress. Major improvements in beach water quality probably will not be seen until the sewerage masterplans for the Tsuen Wan and Tuen Mun areas have been fully implemented. This will take another four to five years.

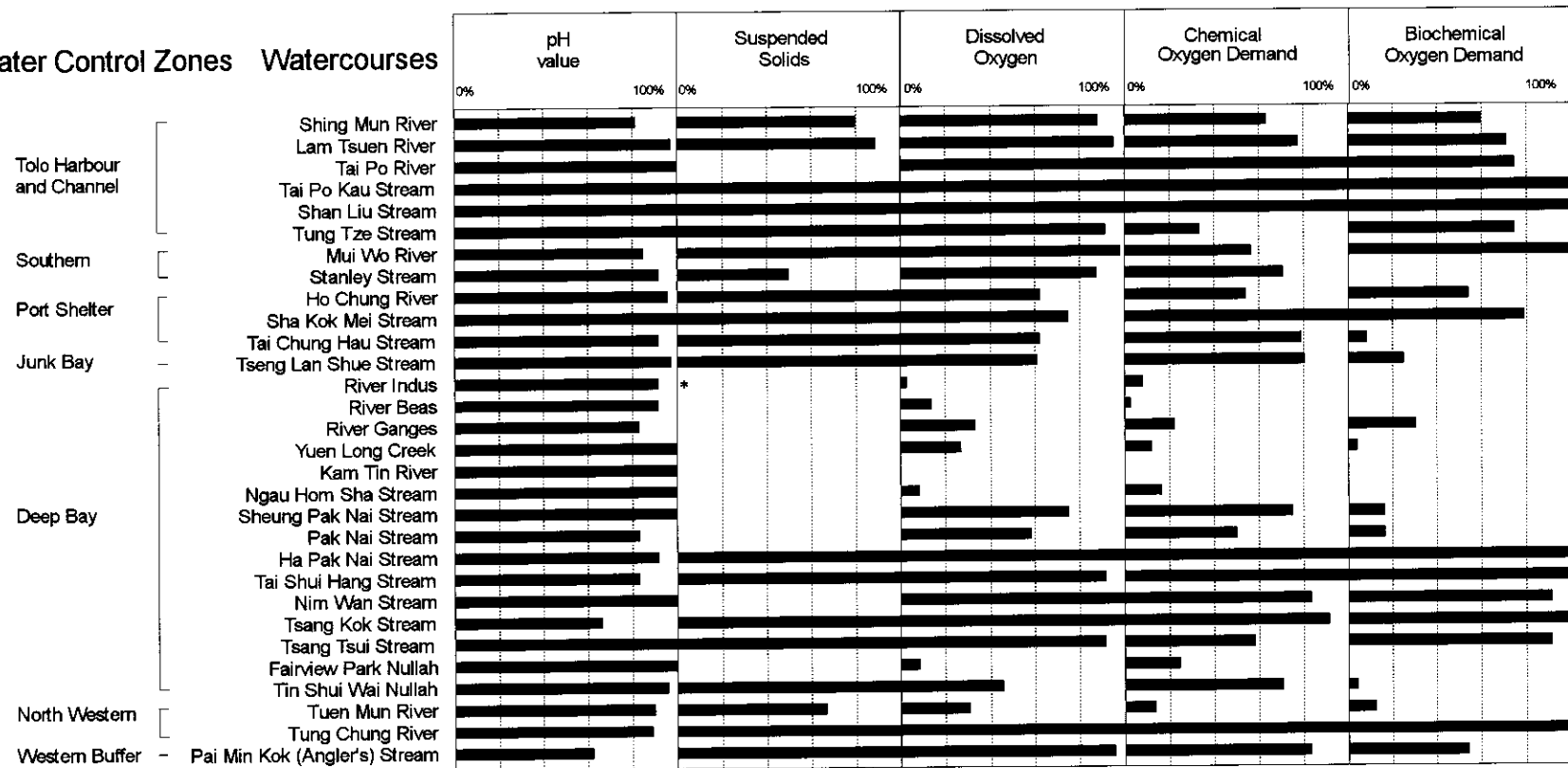


* The absence of a bar indicates 0% compliance

- Note:
1. For Tolo Harbour and Channel Water Control Zone, water column dissolved oxygen means dissolved oxygen level at any point two metres above the bottom in the water column.
 2. For Inner Marine Subzone of Deep Bay Water Control Zone, water column dissolved oxygen means dissolved oxygen level at one metre below surface.

Figure 1 Level of compliance with marine water quality objectives in water control zones in 1993

Water Control Zones Watercourses



* The absence of a bar indicates 0% compliance

Figure 2 Level of compliance of watercourses with the water quality objectives in 1993

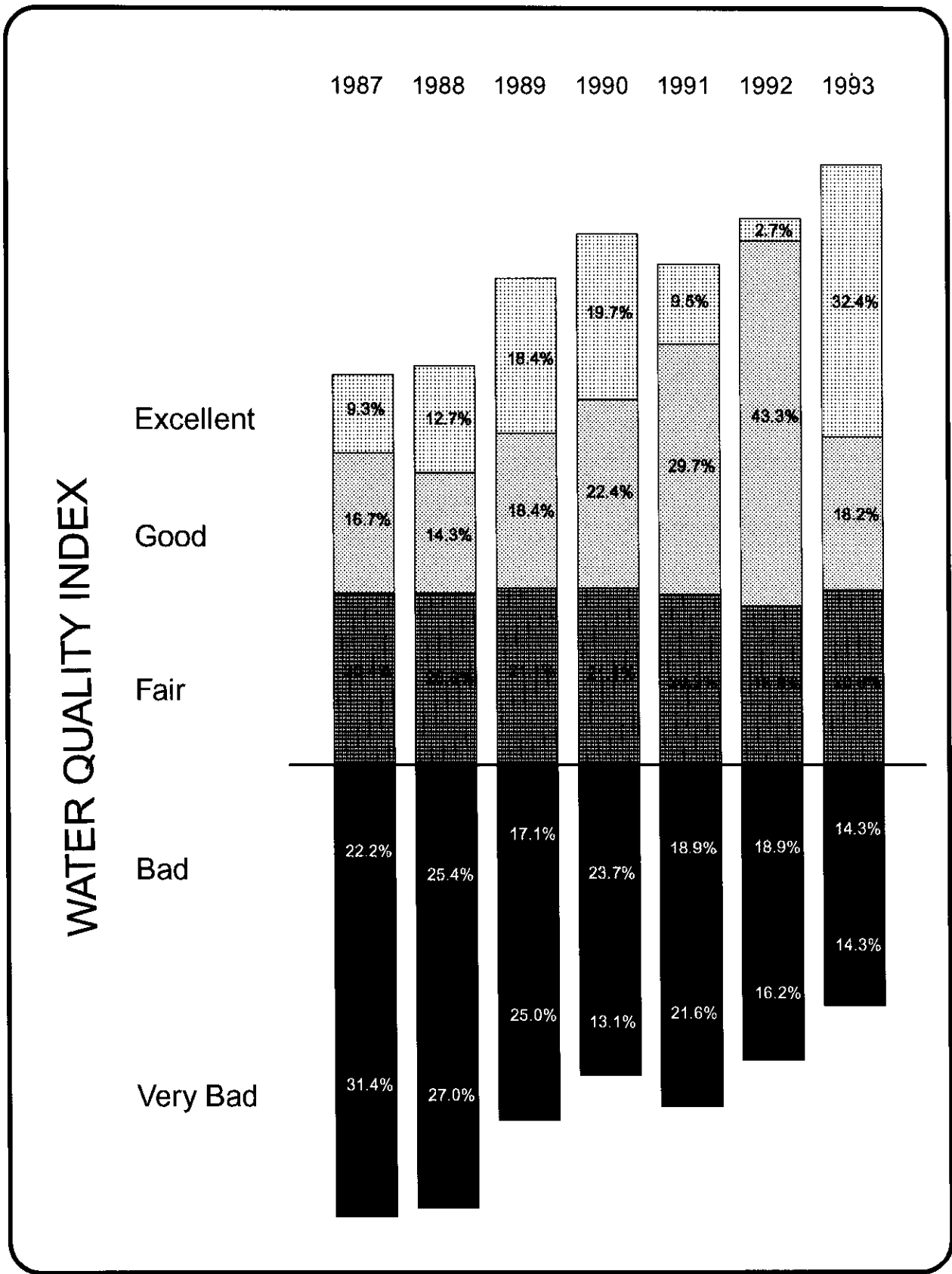


Figure 3 Water quality trends in watercourses, 1987 to 1993

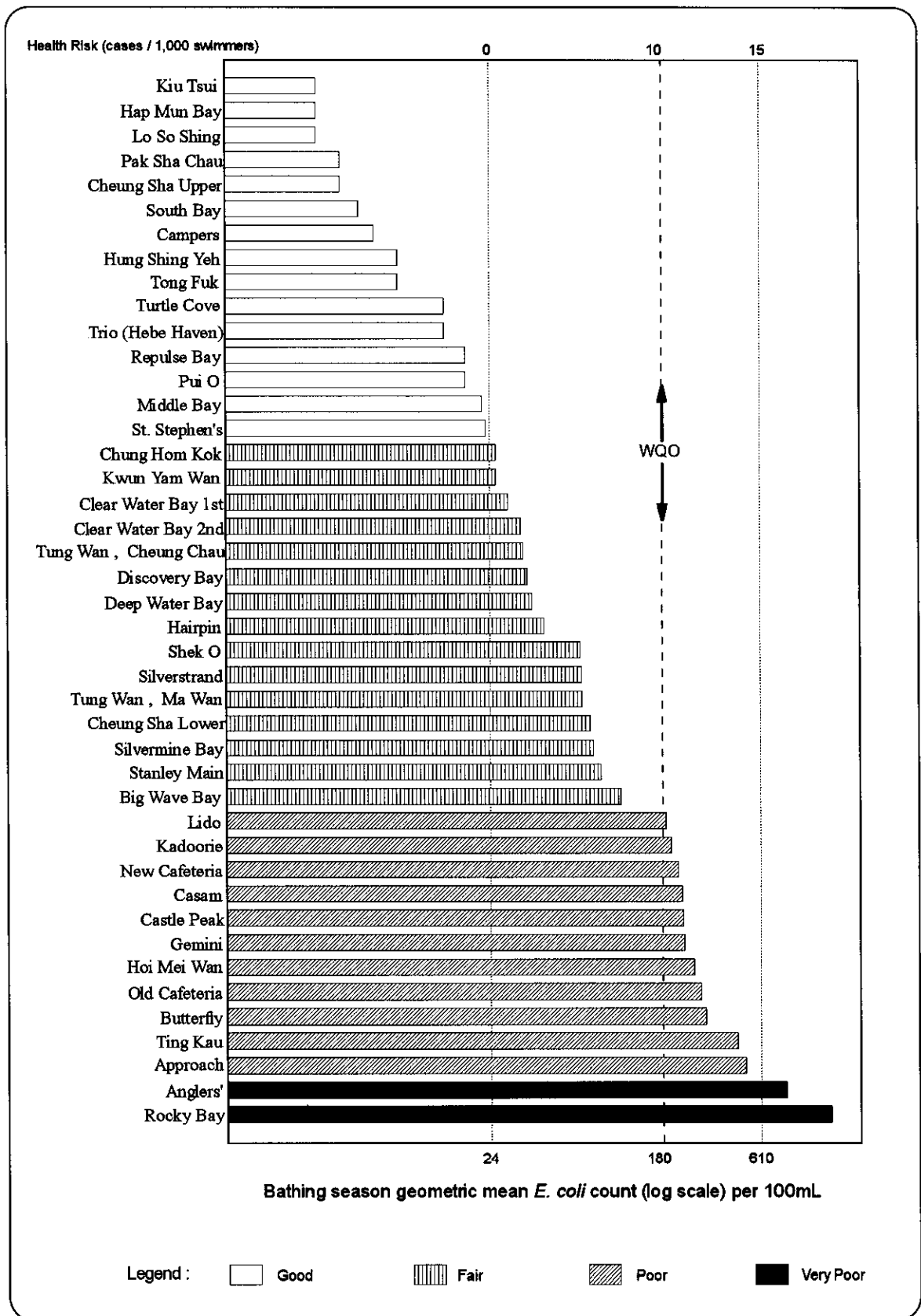


Figure 4 Level of compliance with the bathing beach water quality objective in 1994

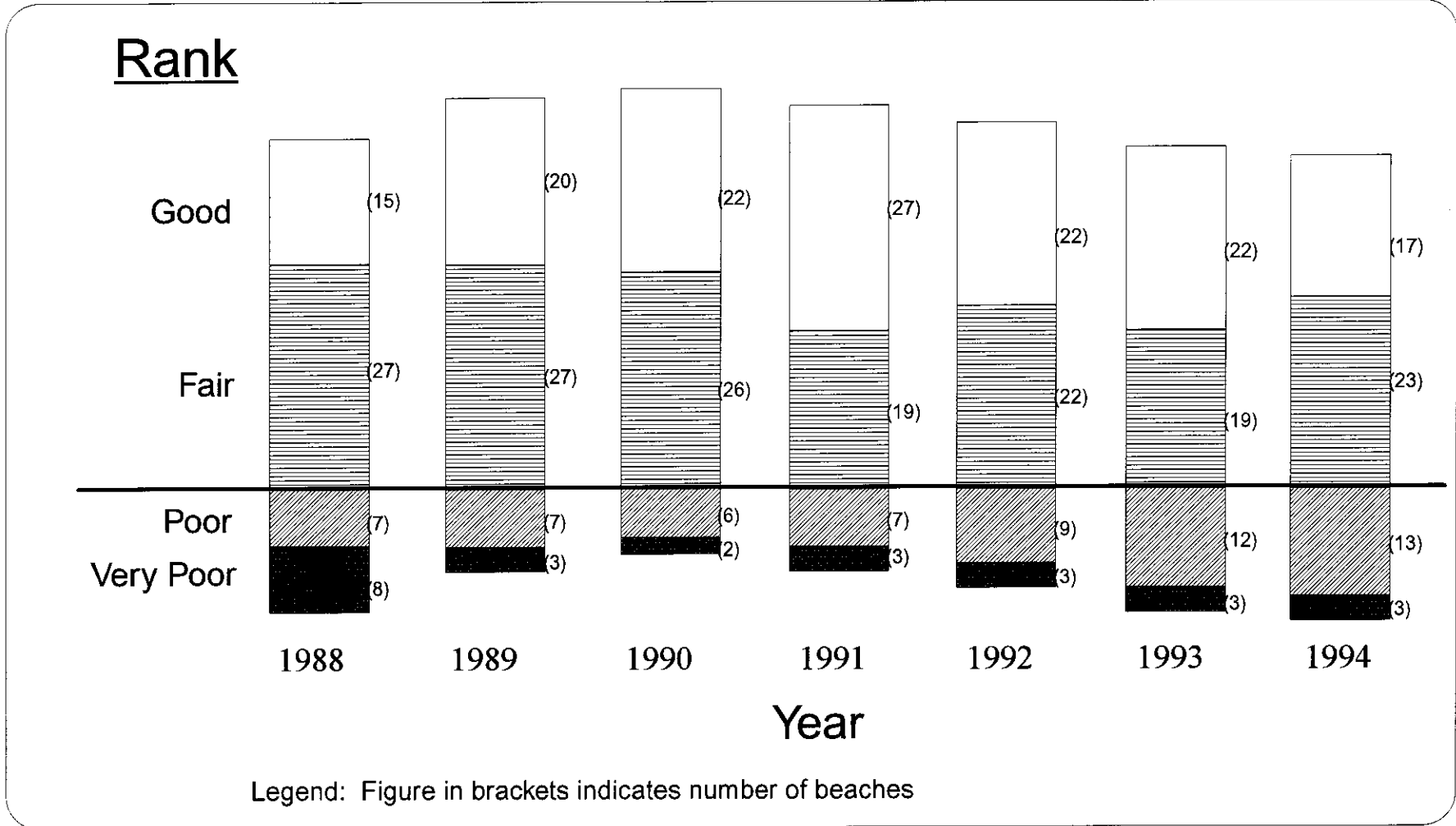


Figure 5 **Water quality trends at beaches, 1988 - 1994**