

KAPITI COAST FLOODPLAIN MANAGEMENT PLANS

WAIKANAE RIVER ARCHIVE

A collation of the management and engineering records of the Manawatu Catchment Board, Central Districts Catchment Board, Wellington Regional Water Board and the Wellington Regional Council (1945-1991)

Prepared for the:

Rivers Department
Wellington Regional Council

by:

John Easter
1991

CONTENTS

1. BACKGROUND TO THE ARCHIVES	5
1.1. INTRODUCTION	6
1.2. EARLY HISTORY	6
1.3. FLOODPLAIN DEVELOPEMNT	7
1.4. THE 1955 EROSION AND FLOOD CONTROL SCHEME PROPOSALS	13
1.5. SCHEME PROMOTION	15
1.6. HYDROLOGY, FLOODING, LOW FLOWS, ABSTRACTION & MONITORING	15
1.7. SCHEME MAINTENANCE	16
1.8. SHINGLE RESOURCES	17
1.9. WAIMEHA STREAM, WAIMEHA & WAIMANU LAGOONS	18
1.10. THE ESTUARY	20
1.11. PLANNING CONTROLS	21
1.12. WORKS BEYOND THE SCHEME BOUNDARIES	22
1.13. SCHEME REVIEW	22
2. ARCHIVES	25
2.1. ARCHIVE 1 : WAIKANAE RIVER PLANS HELD BY WRC 1991	26
2.2. REPORTS AND MCB FILE LISTING	28
2.3. ARCHIVE 3 : SCHEME WORKS 1955	29
2.4. ARCHIVE 4 : ANNUAL EXPENDITURE ON SCHEME WORKS 1954-67	35
2.5. ARCHIVE 5 : WAIKANAE RIVER SCHEME (1955-65)	36
2.6. WAIKANAE RIVER MONITORING	39
2.7. ARCHIVE 7 : WAIKANAE FLOODING	40
2.8. ARCHIVE 8 : LOW FLOWS, ABSTRACTION AND WATER SUPPLY	43
2.9. ARCHIVE 9 : WORKS WITHIN THE SCHEME BOUNDARIES	44
2.10. ARCHIVE 10 : SHINGLE MANAGEMENT	46

2.11. ARCHIVE 11 : SHINGLE EXTRACTION RECORDS	50
2.12. ARCHIVE 12 : WAIKANAE WEIR AT SH1 & NIMT BRIDGES	51
2.13. ARCHIVE 13 : WAIMEHA STREAM.	54
2.14. ARCHIVE 14 : WAIMEHA AND WAIMANU LAGOONS.	56
2.15. ARCHIVE 15 : WAIKANAE RIVER MOUTH	59
2.16. ARCHIVE 16 : WAIKANAE LAND COMPANY DEVELOPMENT	62
2.17. ARCHIVE 17 : PLANNING & CONSENTS	66
2.18. ARCHIVE 18 : SERVICES AND UTILITIES	70
2.19. ARCHIVE 19 : BERM DEVELOPMENT	71
2.20. ARCHIVE 20 : ISOLATED WORKS OUTSIDE THE SCHEME AREA	72
2.21. ARCHIVE 21 : KAPITI - WAIKANAE SCHEME 1983-89.	73

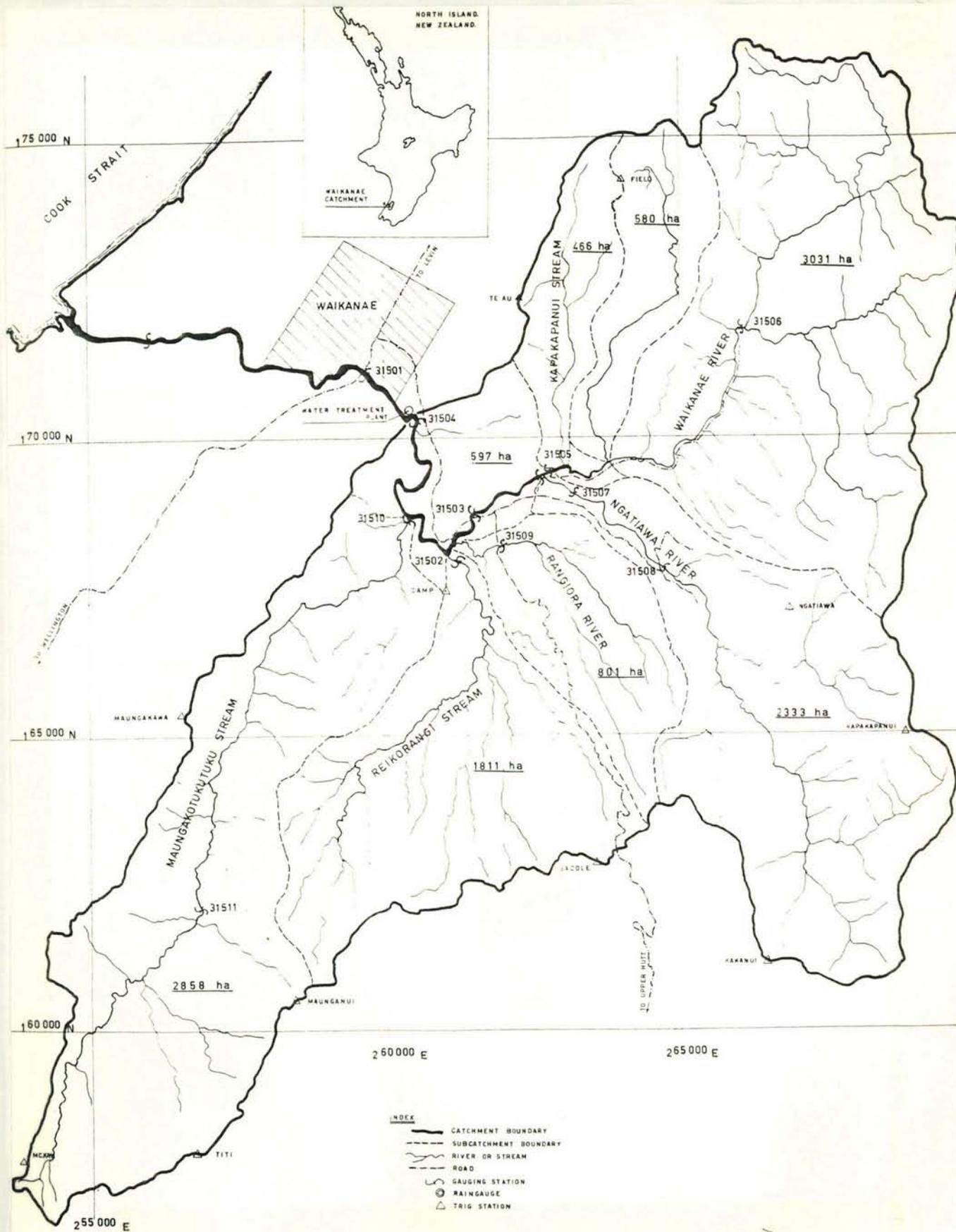


Figure 1. Catchment Location Plan

1.BACKGROUND TO THE ARCHIVES

1.1. INTRODUCTION

The **Waikanae River Archive** is a collation of the administrative records which cover the recent management of the Waikanae River.

Prior to the 1940's, the river and associated crown land was managed by the Lands Department of central government and its predecessors. As there are very few formal management records, background to this period has been obtained from general references and local histories.

In 1941 the Soil Conservation and Rivers Control Act required that catchment boards be established throughout the country, to be responsible for catchment and river management. The Waikanae catchment fell within the Manawatu Catchment Board's (MCB) district. Catchment management activities commenced in Waikanae in 1945 and have continued to the present day.

Between 1972 and 1989 the boundary between the Manawatu Catchment Board district and the Wellington district was changed several times as a result of local authority restructuring. Responsibility for managing the Waikanae River switched between the Manawatu and Wellington districts in 1972, 1982 and 1989. The Wellington Regional Council is the current manager. Despite these changes in responsibility, reasonably complete administrative records have been retained for the period from 1948.

The Waikanae River Archive has been compiled as a series of chronological records, termed **Archives**, classified by subject and being as far as possible direct extracts from the original files of the Manawatu Catchment Board, Central Districts Catchment Board, Wellington Regional Water Board and the Wellington Regional Council. It is a resource document, not a History, as it presents only one slice of the history of the Waikanae River.

This first part of the Archive is an overview of the recent management of the river. This has been written to assist in the interpretation of the subject archives in the second part.

1.2. EARLY HISTORY

Until recently, the Waikanae floodplain was a series of wetlands, contained by the coastal sand dunes and fed by the Waikanae River.

In pre-European times, Maori found the wetland environment to their advantage. Maori extended the swamps and natural watercourses to sustain and improve their food supply. Channels were dug to interconnect the bodies of water to provide a means of access through the dense lowland forest and swamp-lands.

Maori management of the floodplain and exercise of rangatiratanga protected and maintained the fragile wetland environment.

European settlement transformed the wetlands to New Zealand's version of the European pastoral (and now urban) scene. In less than 100 years of occupation, the myriad of waterways and swamps were drained. The Waikanae River was confined to a single narrow river corridor.

The loss of the wetlands can be attributed to the initial phase of European settlement which included unsustainable harvesting of flax and clear-felling of the lowland forests. This all occurred before the introduction of formal catchment management. The 1955 Erosion and Flood Control Scheme, promoted and constructed by the Manawatu Catchment Board attempted to deal with the consequences of this unwise catchment development.

Two physical changes in the river environment also contributed to a reduction of the wetlands. The first was the drying-up of the northern branch of the Waikanae River, circa 1890. The second was the lowering of the bed of the Waikanae River from about 1940 to 1972. The reasons for both follow from the nature of the development of the floodplain which took place in the later part of the 19th century. As these changes were initiated well before the formation of the Manawatu Catchment Board, the mechanisms or events leading to the changes are not adequately covered in these archives. Further research into the lowland flax and timber industries, the road and rail building programs, the climatic extremes and floods of this period (which had such a pronounced effect on the neighbouring Hutt Catchment) and the shingle extraction industry will be required before the changes can be fully understood.

1.3. FLOODPLAIN DEVELOPEMNT

Early accounts of the Waikanae River describe the river as a steep lively stream contained within a heavy forest cover. Mountain streams, cascading from the Tararua Peaks, combined to form a fast flowing mountain river, confined to a gorge by the topography of the foothills, see figure 1, page 4. As it left the foothills it rapidly changed to a coastal river, splitting into two separate channels, the Waimeha to the North and the Waikanae to the South. These branches reunited at the position of the present Waimeha Lagoon. From here the river moved south through an extensive estuary, entering the sea somewhere in the vicinity of Kena Kena Pa (now Mazengarb Road). The estuary dominated the Coastal environment, and with Kapiti Island, formed the focus of Maori occupation. Figs 2 and 3 on the following pages show the river course in 1890 and the current location of roads. Figure 5 is an undated aerial photograph which shows the old northern channel. Figure 4 shows current housing in this area.

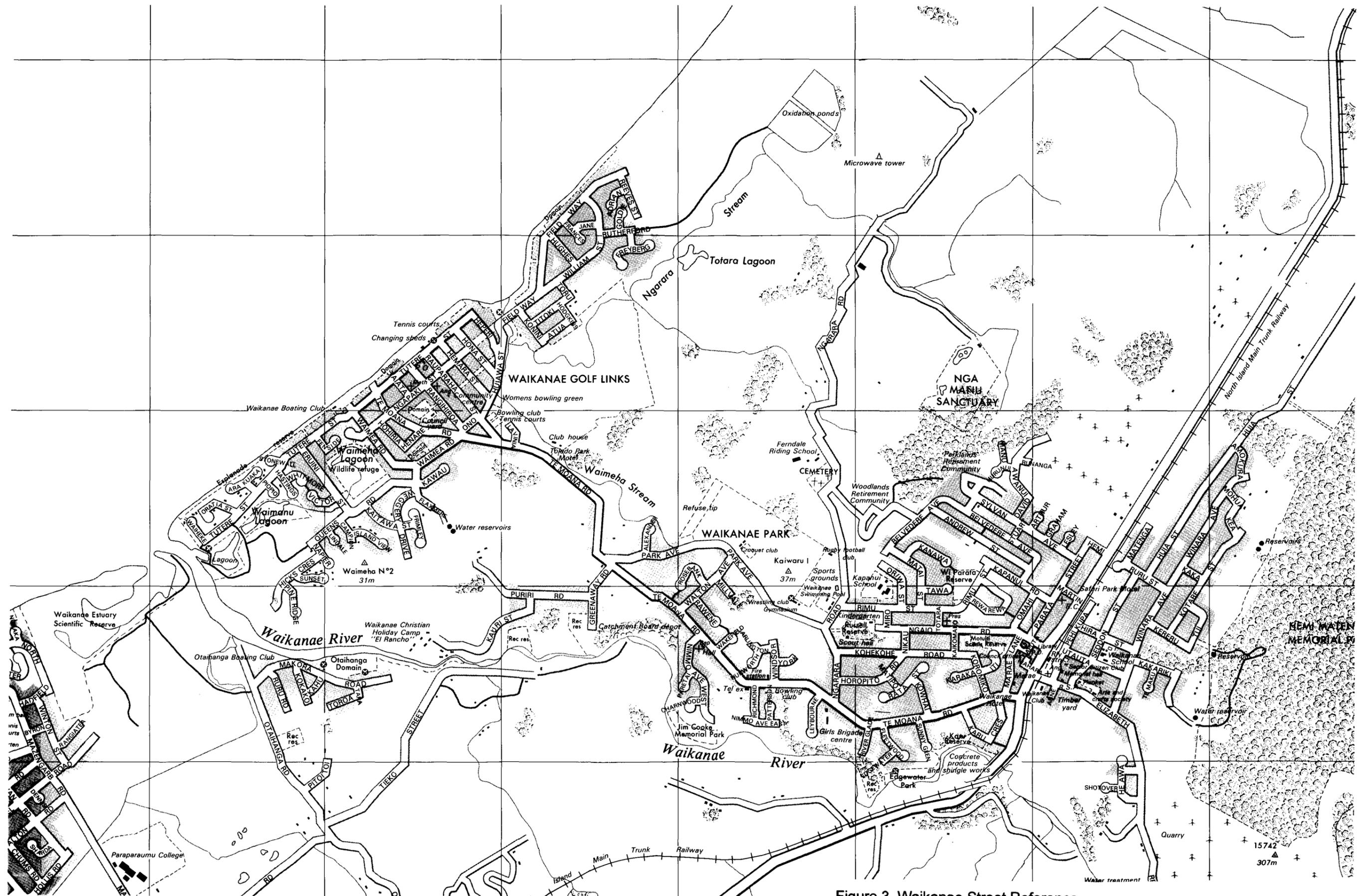


Figure 3. Waikanae Street Reference



Figure 4. A 1990 photograph of the headwater catchment showing the Waikanae River leaving the foothills. Figure 5 is an undated (c1930?) aerial shot of the same reach of river clearly showing the course of the northern Waimeha branch.



The Waikanae River, or southern course, followed closely the current alignment as did the river upstream of the state highway. The Waimeha Stream, or northern channel, separated from the Waikanae River at what is now Edgewater Park and followed the present alignment of the Waimeha Stream to its pre 1920 outlet through the Waimeha and Waimanu lagoons. Contained between the two was the settlement of Tukurakau, located beside the natural river ford near Greenaways Road.

European settlement of the Kapiti Coast closely followed the development of transport routes and access to export markets. In 1886, the railway opened up the flax and timber industries. This led to rapid land clearance and land drainage. By the late 1920's the flax and timber resources were essentially exhausted and the landscape transformed.

Sometime between 1870 and 1896 the northern branch of the river dried up, leaving the Waimeha as a drain serving the local catchment to the boundary of the Peka Peka stream. The Waikanae river retained its southern course and is currently little more than 100m from its 1900 alignment over most of its length.

Forest clearing downstream of the railway extended to the rivers edge, see figure 6. Over this reach, bank erosion became a problem and has continued to the present day. In the upper reaches of the river, a band of trees was left on the river banks. These remnants of the lowland forest retained the original character of the river and provided the shade necessary to maintain the aquatic ecology. Until the forest remnants were cleared the river was known for the quality of the fishing.

The new township of Waikanae quickly developed alongside the railway. 100 houses can be identified on the 1954 plan of the area. Subdivision of the coastal area for holiday and retirement homes did not start until the 1920's when the Waimeha stream was diverted directly to the sea in order to permit the subdivision of the Waimeha Township, now known as Waikanae Beach. Following this initial subdivision, development stalled until the post World War II building boom.

Flooding of the Waikanae River occurred frequently but affected only the lower lying undeveloped areas alongside the river and the estuary. To reduce ponding around the estuary, the river was regularly diverted through the sand-dunes near the location of the current river mouth.

Flooding was not considered to be a problem until a large flood occurred in 1955. At this time, central government was promoting national policies to manage the effects of forest and land clearance through the newly formed Soil Conservation and Rivers Control Council. In line with these policies, and combined with a supportive state funding environment, the Manawatu Catchment Board promoted a scheme of rivers control works.



Figure 6. This undated photograph, possibly taken from the railway embankment around 1900, shows remnants of the lowland forest and the south branch of the river flowing towards the coastal sand-dunes.

The 1955 Scheme promoted the concept that management of the Waikanae River would be of general benefit to the local community. The scheme included works to improve the alignment of the river, works to reduce river bank erosion, construction of stopbanks to control flooding and drainage works to further reduce the remaining wetlands. The Manawatu Catchment Board built the scheme between 1956 and 1964 and continued to manage the river until responsibility for the Waikanae catchment was transferred to the Wellington Regional Water Board in 1972. Responsibility was transferred back to the Manawatu Catchment Board in 1982 and back to the Wellington Regional Council in 1989.

The frequent changes of management inevitably led to difficulties. Of particular concern to the Manawatu Catchment Board was the Wellington Regional Water Board decision to abandon the classified rating base used to fund the Scheme maintenance in favour of funding from regional rates. From 1982 to 1989 the Manawatu Catchment Board unsuccessfully attempted to re-establish a rating district by promoting the Kapiti - Waikanae Scheme for all catchment, river and drainage works to be maintained on the Kapiti Coast.

Since 1980 the Kapiti Coast has had one of the highest growth rates in New Zealand. Most areas previously considered part of the natural flood plain of the Waikanae River are now used for residential housing or zoned for that purpose. Many of these areas remain prone to flooding from the Waikanae River or tributary catchments.

1.4. THE 1955 EROSION AND FLOOD CONTROL SCHEME PROPOSALS

The mid to late 1940's saw the growth of the National Water and Soil Conservation Movement administered by the Soil Conservation and Rivers Control Council (SCRCC) under the provisions of the 1941 Soil Conservation and Rivers Control Act. The Council had ready access to government funds for works which would lead to the wise management of New Zealand's catchments and rivers. This led to the construction of river and flood control schemes throughout New Zealand.

The Manawatu Catchment Board (MCB), also formed under the 1941 Act, started to carry out works in the Waikanae District in the mid 1940's. The first works included the realignment of the river mouth (necessary to reduce water levels in the northern Paraparaumu and Otaihanga areas) and isolated planting and realignment work to relieve minor bank erosion. These works were funded under the "Minor Works Scheme" from the MCB bulk allocation of subsidy monies.

Flooding occurred in July 1951 and caused little concern - minor erosion and overflow occurred in the usual places and it is recorded that the general river alignment improved.

Flooding in February 1955 was not so well received. Apparently the river alignment changed in places, so that properties previously thought to be free from the threat of flooding or erosion suffered damage. Residents demanded that their river be put in order. The MCB already had a scheme investigation in hand and was quick to complete the proposals. Figures 8 and 9 on pages 33 and 34 illustrate the scheme works.

The 1955 Scheme followed the design philosophy of many of the other schemes of its day. This was based on the assumption that the existing form of the river could be redefined to a more stable course that would be substantially cheaper and simpler to maintain than the unimproved channel. Multiple channels and uncontrolled "meandering" were replaced with a single channel on an improved alignment. Development of diversion cuts, clearing of unwanted willow and vegetation, strengthening of bank protection in places recognised as points of permanent erosive of attack, and the introduction of groynes and plantations were established to hold the new alignment. In hindsight, the wisdom of these measures can be questioned. The early confidence is indicative of the short practical experience the engineers had in the management of steep NZ gravel rivers.

The 1955 Scheme included flood mitigation works. The original proposal included low banks (in the order of 1 - 1.5m high) in the Otaihanga and Greenaways Road areas. In the final works, the extent of stopbanking was more than doubled to include the low land on the left bank below SH1. Further flooding occurred during Scheme construction and the stopbanks at Greenaways Road were raised. At the time, most of the land to be protected by the stopbanks was in rural or semi-rural use.

Land drainage also attracted government support as it was then considered complimentary to river channelisation and bed lowering processes. The 1955 scheme included improvements to the Waimeha Stream (then, as now, with a separate, northern mouth) and the Waimeha lagoon. The Waimeha stream, Waimeha lagoon and outlet channels were dredged and enlarged. Water levels in the Waimeha lagoon, controlled by an outlet weir, were lowered after much debate and controversy over the reduction in the wetland area.

Archive 1 contains a listing of the plans which have survived the recent frequent changes of River Authority. The Manawatu Catchment Board numbering system has been retained as this series is most frequently referred to in the file archives. A listing of other reports containing background information on the Waikanae River are listed in Archive 2. Archive 3 contains the details of the 1955 Scheme works. Archive 4 is a schedule of scheme program expenditure.

1.5. SCHEME PROMOTION

The 1955 promotion of the Waikanae Scheme could not have taken place in a more favourable environment for the promotion of a public work. Both the funding organisation, the Soil Council, and the local share contributors required little in the way of financial or environmental reporting. The benefits were assumed. The classification of the area of benefit was unopposed as was the resolution to raise the loan to support the local share. One objection to the start of scheme construction was raised by the owner of the left bank lowlands (Buchanan) who required the flood protection of his lands. His objection was satisfied by the extension of the scheme to include left bank stopbanking - adding 30% to the Scheme capital costs.

It is not clear why the Scheme received such solid support. The works were minor and many of the contributors, although of above average income, had also contributed similar sums to individual river works on their properties over the 1945 to 1955 period. Probably all were convinced that they were embarking on a capital work program which would solve the flooding and erosion problems.

The archives detailing the process of scheme promotion through to the process of scheme review in 1982 are summarised in Archive 5.

1.6. HYDROLOGY, FLOODING, LOW FLOWS, ABSTRACTION & MONITORING

Very few flood observations are recorded for the Waikanae River prior to the establishment of the Reikorangi slope/area observation reach in 1967 and the installation of the recording structure (station 31504) upstream of the Waikanae treatment plant in 1975. Since that time the recording station has had a chequered recording history with very few large floods to confirm an apparently unstable station rating. The most recent, in 1990, has helped in this process, however, there is still considerable debate on the frequency and size of extreme events. For instance the 1955 design discharge (later taken as the "100 year" peak flood discharge) of $680 \text{ m}^3/\text{sec}$ is possibly 50% greater than the current "tentative" estimates.

The processes of monitoring the Waikanae Catchment are reviewed in Kapiti Flood Plain Management Study "Climatology and Hydrology". Chronological extracts from the archives are contained in Archive 6.

The Waikanae catchment lies directly between the Otaki and the Hutt River Catchments. Both these rivers have good flood records and it is probable that extreme flooding occurred in the Waikanae on dates when large floods were

recorded in both these catchments. Flooding of some magnitude could be expected in the Waikanae during any major event in either catchment. Refer to chapter 8 of Hutt River Flood Control Scheme Review Volume 12 "A Modern History 1840 to 1990" for a record of flood events in the Hutt, and to Kapiti Coast Flood Plain Management Reports "Otaki River Archives" and "Kapiti Coast climatology and Hydrology" for records of Otaki Flooding. The observations of Waikanae flooding are obtained in Archive 7.

Low flows and abstraction from the Kapiti Coast waterways have been contentious issues for many years and the Waikanae water resource, as for most of the Coast, is fully allocated. The major allocation and abstraction is for the Waikanae Water Supply Scheme intake, some distance above SH1.

The archives show little evidence of a thorough understanding of the minimum low flow acceptable for the Waikanae River, despite the current water rights held for the abstraction, and it is likely that this will be the subject of further investigation as pressure on the water resource increases. The few archives dealing with abstraction and low flow are listed in Archive 8.

1.7. SCHEME MAINTENANCE

The most active recent period of Waikanae flooding occurred during and shortly after the Scheme construction between 1955 and 1968. Scheme works failures appeared either as identified flood damage or as "follow-up" scheme works.

Beyond this period of establishment, maintenance has been essentially a repeat of the "isolated works" undertaken prior to the scheme construction - small diversions often associated with shingle extraction, the occasional section of riprap bank strengthening and the continued planting of live bank protection by a variety of methods. Attempts have been made to maintain adequate stocks of willows for use in live protection works. In 1970 a programme of poplar and macrocarpa planting was undertaken to provide larger plant material for the construction of tree groynes. The "adequate resource" of plant material recorded in 1954 was largely depleted and not replanted during the scheme construction.

Archive 9, Waikanae River Works, illustrates the "minor works nature" of the continuing scheme maintenance (and in fact the original scheme works). As the engineering files have been transferred back and forth between the Manawatu and Wellington Regions, details of Scheme maintenance have been lost or misplaced and periods of apparent low activity may be due to lost records. Many of the works were described as miscellaneous isolated works within the Catchment Board region and cannot be identified.

The maintenance of the scheme included the management of the shingle resource, the management of the estuary and the Waimeha stream and lagoon.

Within all three of these specific areas, developments on the floodplain were of more concern to the river managers than the requirements of routine maintenance. Separate Archives 5,6 and 7 have been compiled to record the developments effecting these areas.

1.8. SHINGLE RESOURCES

The years during and immediately following the exploitation of the Waikanae forests, including the removal of the lowland coastal forest from 1886 followed by the felling of the Reikorangi hinterland, both largely completed by 1930, were unusually flood prone, as recorded in the adjoining Otaki and Hutt catchments.

The 1924 flood is one of the few recorded for Waikanae, however in the Hutt and Otaki larger order floods occurred in 1893, 1896, 1898, 1913, 1915, 1922, 1924, 1931, 1939, 1947 and 1948. The Otaki catchments was severely effected by a wind storm in 1936 which led to widespread wind-throw and erosion in the northern areas.

As any resident of Waikanae will testify, Waikanae does not experience the climatic extremes of either Wellington or Otaki. With this qualification, it may, however, be safe to assume that extreme rainfall did occur in the Waikanae catchment during the 1890-1950 period and that the river bed-load during, and immediately following the forest clearing operations, would have been considerably higher than "normal", if such a figure can be defined for a rapidly changing catchment.

At this stage it is not clear when shingle extraction commenced from the bed of the Waikanae River, but by 1955, the history of extraction administered by the Land Department was sufficient for the Manawatu Catchment Board to renew the shingle rights and leases and to continue "past practice". The royalties collected by the Land Department in 1955 amounted to approximately £1000 - at least 60,000 cubic metres if the then current Otaki royalty rate applied. Also it may be fair to assume that from the war years to 1955, during the road building boom, much of the roading aggregate and foundation material was obtained from the River, probably without the payment of royalty.

Unfortunately very few records have been retained within the engineering files of the actual volumes of material removed from the Waikanae River, as can be seen from the omissions in archive 11. To fill the gaps a search of the Land Department, Public Works Department and County roading records may be required along with the records (if any) retained by the extraction companies.

Archive 10 records the general management of the shingle resource from 1955 to the present and follows the depletion of the resource, the closing of the river to general extraction in 1972 and the associated bed degradation

Bed degradation was a particular concern beneath the SH1 and NZR bridges. The principal concern was not for river management but for the security of the bridge foundations. This problem first surfaced in 1958 and has continued to the present day. As a result of bed lowering a series of weirs have been built to compensate for inadequate foundation depth, initially on the NZR bridge (later corrected by the NZR), on the ageing State Highway Bridge, and then again on the replacement State Highway One Bridge.



Figure 7. Ministry of Works construction of the Waikanae weir to control bed levels downstream of the state highway bridge. The rock weir replaced a concrete block weir that had been constructed and maintained by the catchment boards.

Archive 12 lists details of the succession of weirs constructed downstream of the State Highway One Bridges between 1959 and 1985.

1.9. WAIMEHA STREAM, WAIMEHA & WAIMANU LAGOONS

The original course of the northern branch of the Waikanae River, the Waimeha River, is now difficult to locate, even with the aid of aerial contoured photography. The line of the old watercourse is well hidden beneath roading and private garden development.

The morphology and relative sites of the north and south branches has not been researched nor has the mechanism and date of the Waimeha River closure. From comparison of plans made in the 1870's and 1890's it appears to have

become a dry river bed in the early 1890's (refer "Waikanae past and present" Chris and Joan McLean 1988. page 154). As a guess the most likely mechanisms for the northern branch closure are the milling of the lowland and forest, the effect of the railway bridge northern approach embankment, and possibly extreme floods in 1893 and 1894. The drying of the Waimeha may already well been occurring as a natural process, accelerated by the rapid changes on the coastal plain.

It appears from, older aerial photographs that the old entrance to the northern branch (now the upstream end of Edgewater Park) was permanently closed. The Waimeha River was reduced to a local drain, presumably following the older river alignment, and it remained in this form until 1921 when it was diverted directly to the sea along the line of Huiawa Street to permit the subdivision and formation of the Waimeha Township. The truncated Waimeha stream outlet, which included the Waimeha lagoon area, remained as a separate minor catchment. The development of a new estuarine area for the Waimeha stream commenced and is still continuing, much to the concern of the local residents and land owners who undoubtedly do not appreciate the consequence of the diversion which permitted their beach front occupation. It will be interesting to see how far the new estuary is permitted to develop before it is forcibly restrained. Repeated mouth realignments had been made to retain the outlet at the centre of the estuary but in recent years there appears to have been significant enlargement of the estuary area.

Works on the Waimeha stream have included the infrequent realignment of sections of the channel to facilitate roading or subdivisional works, and frequent dredging operations to initially deepen the channel and, more recently, to control weed growth. In recent years weed growth has been controlled by the injection of an aquatic weedicide.

Management archives for the Waimeha stream are contained in Archive 13.

The legacy of the 1921 stream diversion did not end with the problems associated with the new Waimeha Stream mouth. As the subdivision of the Waimeha Township continued, complaints of inadequate drainage of the truncated section of the stream increased. The lowering of the Waimeha lagoon by the enlargement of the outlet channel to the Waikanae estuary was proposed as part of the 1955 Waikanae Scheme of Works to solve these drainage problems. This proposal led to fierce debate between those who wished to preserve the lagoon as a bird sanctuary, and those who wanted improved drainage. The lagoon was lowered, then raised and then lowered permanently.

The Waimanu Lagoon, the enlarged outlet channel of the Waimeha Lagoon, was created in 1970 as the result of the attempts to enhance a further subdivisional proposal. The lagoon was to be the boat harbour for a marina based development by the "Waikanae Land Company". Although most of the proposed

subdivision has proceeded, the Company failed through its attempts to establish a navigable fixed river mouth.

Archives relating to the Waimeha and Waimanu Lagoons are contained in Archive 14. The Waikanae Land Company Developments are recorded in Archive 17 and in the next section.

1.10. THE ESTUARY

In pre-European times, the estuary occupied twice the area of the current reserve, extending at least as far south as the location of the Kena Kena Pa (Mazengarb Avenue). All of the estuarine area lost to housing development has been euphemistically termed "natural accretion", although the term reclamation would be a more proper description.

The greatest change within the estuarine environment has been the stabilisation of the sand dunes. Throughout the coastal strip north and south of the river the dunes were of immense proportion, very mobile, and apparently capable of moving rapidly and burying large structures in their path. The process of sand dune stabilisation is attributed to the first European owner of the coastal strip north of the Waikanae estuary, H.W. Field, who imported marram grass from Australia. (Field was also responsible for the diversion of the Waimeha Stream and the subdivision of the Waimeha Township.)

It is likely that the naturally occurring equilibrium position of the river mouth is in the area of the early Maori settlements, north of the Kena Kena Pa. There would have been little incentive for the Maori to realign the mouth to its northern position as has been current practice since at least as early as 1930. 1876 plans show an old mouth at Kena Kena and a new mouth in the northern position. Presumably the mouth drifted south as far as Kena Kena until a flood breached the northern end of the sand spit formed during the southern drift. The Kapiti Coast is subject to predominantly north-westerly wind and tidal currents which produce a southward littoral drift. As a result of the development of the housing areas around the estuary, movement of the river mouth more than 500m south of the northern mouth position causes unsatisfactory outlet conditions for the subdivisional drains, loss of water quality during low flow, and increases the risk of flooding in the lower reaches of the Waikanae River. On average the mouth has been realigned to the northern position once every five years.

In 1970 proposals to fix the mouth in the northern position were prepared by the Waikanae Land Company, who wished to promote land sales through the development of a pleasure craft harbour with an navigable access to Rauoterangi Channel. The proposal was publicly aired by way of a water right tribunal hearing held in 1972 and it is indicative of the then current attitude towards the development of floodplain and river lands that the tribunal recommendation

supported the proposal - claiming in effect that (at that time) the destruction of the estuary environment was already "fait accompli". The evidence presented to the tribunal hearing is essential reading if one is to understand, or at least be aware of, the thinking that drives the current pressure for subdivisional development.

Both the Manawatu Catchment Board and Wellington Regional Water Board were opposed to the fixing of the river mouth on the grounds that they may have become liable for the long term maintenance of a facility which they rated had little chance of success. It was almost certainly the Wellington Regional Water Board's additional approval conditions, requiring the Waikanae Land Company to secure funds against future maintenance, which killed the project.

Archive 15 records the general management of the river mouth. Archive 16 contains a summary of Manawatu Catchment Board River Mouth design criteria - their assessment of conditions which can lead to flooding in the lower reaches of the Waikanae. Archive 17 identifies the processes which were followed in the consideration and approval of the Waikanae Land Company proposal to radically alter the estuary environment.

1.11. PLANNING CONTROLS

The Kapiti Coast has one of the highest growth rates in New Zealand. Once rendered "flood free" the riparian private land holdings have been quickly subdivided.

The Manawatu Catchment Board had a consistent policy discouraging construction on, or the filling of the floodplain, regarding either as a diversion of the river. In 1972 when the Wellington Regional Water Board became the river managers floodplain filling was permitted provided property assets (buildings, septic tanks, driveways etc.) were not constructed within the area of the flood plain considered prone to erosion. When the Manawatu Catchment Board again become the river managers, their attitude to filling had softened. Changes in the local authority boundaries also resulted in a softening attitude towards development of the flood plain. For example in 1972, when the land south of the river was part of Hutt County it is recorded that the County considered that the process of subdivision around the estuary had reached the extent of useable land.

As the floodplain developed, the recreational potential of the river landscape received attention. In 1955 the Horowhenua County (HCC) used reserve land in the Greenaway Road area as a general landfill. In 1970 the Waikanae County Town Committee of the HCC promoted a joint venture between the County and the Catchment Board for a planting and beautification program.

Archive 18 covers the specific consents considered by the river authorities for the development of lands adjacent to the Waikanae River. Consents pertaining to the Waimeha are contained in Archive 13. Consents pertaining to specific bridge waterway approvals or utility river crossings are contained in Archive 19. The gradual interest in the recreational development of the flood plain is recorded in Archive 20.

1.12. WORKS BEYOND THE SCHEME BOUNDARIES

The eastern extent of the 1955 Scheme area can be roughly defined by the access road into the Waikanae Water Supply intake and treatment plant, approximately one kilometre upstream of State Highway 1. Works outside this area have been managed as "isolated works", each treated as an individual rivers control or soil conservation project, then eligible for government subsidy support.

With the exception of the isolated or minor works constructed throughout the river prior to the scheme construction, Isolated works have occurred only in the Reikorangi area, mainly in the reach from the confluence of the Ngatiawa River to Reikorangi Bluff. The works have included the frequent realignment of the central river channel and willow planting, in the past associated with shingle extraction. As for many river works, the perceived urgency has declined following the reduction and removal of Government subsidies. Recorded isolated works are listed in Archive 21. Unfortunately, as many of these works involved simply bulldozing the river, there is very little information contained on the engineering files other than approximate location and total cost.

1.13. SCHEME REVIEW

Until 1972 the Manawatu Catchment Board managed the Waikanae Scheme for the benefit of ratepayers within a defined classification area. Management decisions were clearly related to the requirements of the 1941 Soil Conservation and Rivers Control Act and to the interests of the classified area ratepayers. This clear identification of interest is illustrated by the approach taken by the MCB during the Waimeha Lagoon and Waikanae Land Company debates. The MCB funded the scheme from continuing Soil Council Subsidies and from rates from the classified area. The basis for the continuing subsidy is not known as the original 1955 approval for the scheme works excluded the ongoing subsidy of maintenance works.

During the ten years of Wellington Regional Water Board Management the focus on local benefit was not required as the scheme was funded by the regional ratepayer. Few changes occurred in river management practice other than the adoption of some methods used on the Hutt River - most notably selective

shingle extraction, aquatic weed control and development of the river berm environment.

The major management change occurred by default through the WRWB failure to maintain the classified rating rolls. Subdivisional and use changes over a ten year period effectively invalidated the scheme classification (note: by the 1972 WRWB Act the WRWB did not have access to the classification and rating provisions of the 1941 Soil Con Act, these being replaced by the provisions to levy regional rates).

When the MCB reabsorbed the Waikanae into its district in 1980 it had no method of funding the Waikanae Scheme maintenance other than through its bulk allocation of subsidy monies for minor works, with the local share collected directly from the local authorities, the Kapiti Borough Council and Horowhenua County Council. Under its empowering acts, the MCB was required to establish a new classification area, either for the benefits provided by the existing scheme, for a proposed improved scheme standard, or for an enlarged scheme area.

In order to include the widest rating base the MCB proceeded to promote the "Kapiti - Waikanae Catchment Control Scheme", the proposed amalgamation and upgrading of all the drainage and river schemes on the Kapiti Coast between Paekakariki and the Southern Boundary of the Otaki Scheme. The scheme included a five year program of works to rebuild Waikanae stopbanks and river works (not unlike the 1955 proposals) and proposed improvements to the drainage systems throughout the district.

Probably because the scheme was compiled to maximise the rating base, rather than as a logical association of areas of interest and benefit, by 1986 the proposed scheme had been reduced to cover only the area and scope of the original 1955 scheme.

The reduced scheme was promoted to the Local Authorities in 1988 and although largely accepted by the HCC the Kapiti Borough Council refused to support the proposals without detailed cost benefit analysis and the consideration of other options. Based primarily on the objections of the residents of Otaihanga, KBC refusal was on the grounds of the need for the KBC to adequately consider competing demands for its rating dollar. The proposal was presented with an anticipated 30% - 35% government input and it was not the Kapiti Borough Council refusal to contribute which killed the scheme, but MCB withdrawal after the removal of the subsidy support, soon after.

Since 1982, the 1955 Scheme had been funded from surplus funds within the Manawatu Catchment Board bulk allocation subsidy money. In 1989 a 25% reduction in the bulk allocation to the Manawatu Catchment Board occurred and the board was presumably left with no option but to review its expenditure on isolated and new work proposals. Its consideration of support for the Waikanae

proposal would, no doubt, have been heavily influenced by the proposed November 1989 redefinition of local authority boundaries which saw the catchment area once again transferred to Wellington control.

As part of its annual plans the Wellington Regional Council has defined as a major activity the completion of a Flood Plain Management Plan for the Waikanae. Possibly for the first time the flood plain (as distinct from the river channel) is being considered as a study area. The future direction of the management of the 1955 Scheme will evolve from this study as will plans to minimise the effects of floods which will inevitably occur on the highly developed flood plain. Meanwhile, management of the river continues very much on a "past practice" basis, funded once again from a regional rate.

Archive 22 summarises the key aspects of the Kapiti Waikanae Scheme.

2.ARCHIVES

This section contains a series of tables which record, in chronological order, the contents of the engineering records of the management of the Waikanae River.

The records are not complete as they contained only the files retained by the Manawatu Catchment Board, The Wellington Regional Water Board, The Central Districts Catchment Board and the Wellington Regional Council.

The collation will provide an adequate understanding of the process of Waikanae River Management. The User should widen the focus to include other historical research archives to support specific research.

2.1. ARCHIVE 1 : WAIKANA E RIVER PLANS HELD BY WRC 1991

Plan no.	Description	Date
192	Work at river mouth.	1948
611	Proposed scheme works.	1954
612	Progress on scheme works marked on copies of plan 611.	1956/59
625	Horowhenua C.C. proposed Waikanae County Township.	pre 1954
628	Classification plans. Includes marked up 1973 aerials showing public land and land vested in the MCB.	1954
703	Otaihanga rock protection 1m 15 ch.	29Jun55
708	Proposed boundary alterations to MCB to include Waikanae classification area.	20Jul55
797	Plan of catchment area.	1Jun56
798	Rock Protection 4m 10ch, "Waterhouse".	13Jul56
825	Scheme stopbanking right bank 2m - 2m 60ch.	21Mar57
838	Proposed Otaihanga stopbanking.	15Mar57
852	Waimeha lagoon proposed scheme improvements.	16Jul57
932	Waimeha Stream proposed scheme upgrading.	27Nov58
1136	Diversion Waimeha Stream for "E.W.Howse" subdiv. Park Road from Te Moana Rd to the current landfill entry.	30May61
1383	Showing drainage easements on the Waimeha Stream, Park Ave area.	Jul64
1390	Aerial photograph mouth to Reikorangi.	5Apr68
1476	Current river course and property boundaries, Greenaways Rd to SH1.	Apr66
1497	Proposed berm planting and development, Edgewater Park to SH1 bridge.	Sep66
1589	Proposed stopbanking at Otaihanga Township.	28Jun69
1703	Waikanae Land Company proposed beach subdiv.	22May70
1775	Proposed Weir SH1 & NZR bridge bed level control.	31Mar71
1790	Waimeha Stream diversion, Huiawa / Te Moana Roads (Bowling Green).	26Oct72
1791	Cadastral Plans, Greenaways Road "Leith's" & Otaihanga.	various
1822	Scheme Plan, Fleetwood & Edgewater Rds, "Waikanae Property Enterprises Ltd".	Mar72
1823	Scheme Plan, Nimmo Ave West, "Te Moana Enterprises Ltd".	May72
1830	Waikanae Land Company, proposed mouth stabilisation. Showing Paraparaumu Nth subdivisions.	9Aug72
1835	Waikanae River mouth & estuary contour plan.	30Aug64
2000	Aerial photograph mouth to W.T.P.	Oct73
2415	Waimeha Lagoon survey.	20Aug82
2429	Waikanae Catchment Water Resources, contour plan, cadastral plan, land use.	1976
2431	Drainage improvements, "Howarth ex Buchanan" property approx l.b.4mi.	May76
2432	Proposed Zoning above water intake.	undated
2433	Waikanae catchment plan.	Nov73
2434	Waikanae catchment land use capability and inventory.	undated

2.1. ARCHIVE 1 : WAIKANAЕ RIVER PLANS HELD BY WRC 1991

Plan no.	Description	Date
2439	Waimeha stream, long section and plan.	11Nov82
2504	Waikanae River Survey - superseded by plan series 2811.	10Jan84
2508	Waimeha - Peka Peka Road drainage scheme.	20Feb84
2510	Waikanae River gauging tower details, section, longsection, weir details.	8Nov83
2523	Proposed Kapiti - Waikanae Catchment Scheme.	13Jun84
2525	Drainage channels, Elizabeth Street.	18Jun84
2535	Hadfield Creek, Peka Peka & Tributary Area.	26Jul84
2554	Waikanae River floodable area.	11Oct84
2560	NZ Post telephone duct river crossing.	19Jul84
2561	Subdivision proposals, "Sheffield Properties" Ex Lion Safari Park, Sth bank.	Dec84
2564	Waikanae backwater curves prepared by the WRWB. Includes SSP survey Oct74.	c.1976
2576	Drainage channels, Elizabeth Street, "J.Nash".	27Mar85
2583	Subdivision 14a Puriri Road - spot levels.	26Jun85
2600	Waikanae River backwater curve profiles.	30May86
2635	Aerial Photographs.	24Mar86
2708	Drainage channels, Elizabeth Street "Benge Partnership".	29Jul86
2719	Waikanae River survey adjusted traverse Greenaways Rd & Otaihanga, superseded by 2811.	Sep86
2748	Subdiv. Greenaways Rd. "Larkin" contour survey.	20Nov86
2751	Waikanae River 100yr flood profile (part).	10Dec86
2768	Proposed stopbanks Otaihanga and Greenaways Road.	4Feb87
2796	Waikanae River floodable areas.	2Jul87
2800	Waimeha catchment plan.	c.1986
2801	Catchments draining to Hemi Metenga subdiv. (East sh1/Nth river).	c.1986
2802	Waikanae catchment plan.	c.1986
2803	MWD proposed bed level control weir, SH1.	21Dec84
2804	Otaihanga aerial photographs 1:1000 Kapiti Borough Council.	25May85
2811	Waikanae River Survey. New Traverse.	14Oct87
2812	Waione subdivision. Rankine and Hill plans.	Jul90
2813	Waikanae generalised floodable areas from preliminary information.	17Jul90
2814	Floodable areas.	1985
	Horowhenua / Kapiti Aerial prints 1:10000.	6Oct80

2.2. ARCHIVE 2 : WAIKANAЕ REPORTS AND FILE REFERENCE

Reports

- River scene at Waikanae, New Zealand (picture)* /C.B. Barraud, 1852. painting : oil on canvas.
Birdlife at Waikanae Estuary / (by M.L. Falconer, C.A. Fleming and K.A. Wodzicki). Wellington.
Waikanae : Past and Present / Chris and Joan MacLean; (edited by Anna Rogers). Waikanae (N.Z.) : Whitcombe Press, 1988.
Waikanae Estuary Proposed Scientific Reserve Management Plan. Wellington (N.Z.) : Dept. of Lands and Survey, 1986.
Waikanahi (i.e. Waikanae) pa and part of Kapiti, August, 1846. Power, W. Tyrone (William Tyrone)
Some Geological features of the Otaki - Waikanae District. Te Punga M.T. 1962. N.Z. Journal of Geology and Geophysics 5(4):517-30.
Seismic Survey Waikanae water Treatment Plant. DSIR Geophysics Division Report No 93. S.R. Hicks.
Hanui Matenga Memorial Park Scenic Reserve Draft Management Plan. Dept. of Lands and Survey Management Plan Series No.SR27
Coastal Erosion - Kapiti Coastline. National Soil and Water 1988 J.G. Gibb and D. Wilshere.
Waikanae River. 11 July 1955. (Erosion and flood control scheme proposals) P.G. Evans, Manawatu Catchment Board.
The Water Resources of Waikanae Catchment (Draft) B. de Jonge Wellington Regional Water Board 1976.
The Kapiti - Waikanae Catchment Control Scheme and Proposed Works. 1987-1992. MCB report No. 69 May 1986.
Data Audit for Waikanae at Water Treatment Plant (site No 31504) 3 Mar 75 to 31 Mar 90. Report AU 203. DSIR

Manawatu Catchment Board Engineering Files

- | | |
|---------------------|--|
| 10/12/E | Waikanae Proposals, Scheme promotion and early scheme works 1955-1960 |
| 10/4
Vols 1 - 9 | Waikanae River Management 1951-1990. |
| 10/4/E | Horowhenua South classification - Waikanae 1956 classification. |
| 10/4/E Volume 2 | Waikanae Reclassification 1985 - 1989. |
| 10/2 | Horowhenua South Board approved works - Isolated works prior to the scheme construction and outside the scheme area 1945-1968. |
| 10/1
Vol 1 & 2 | Horowhenua South - General Engineering correspondence 1969-1988. |
| 10/7 | Kapiti-Waikanae Catchment Scheme 1984-1987 - also covered in 10/4 series. |
| 10/5/1 | Waikanae River Shingle Resources and River Bed Surveys 1959-1981. |
| 24/7 | Shingle licence - Golden Bay Cement Group 1975-1987. |
| 10/3/E | Horowhenua South Soil Conservation, 1948-1956 |
| 10/7/E | Horowhenua South Waikanae River Mouth, 1947-1969 |
| 10/9/E | Horowhenua South Waikanae River, Long, Weggery Dolman and Kebbell's Erosion 1947-1948. |
| 20/11/6 | Waikanae Water level Recorder 1967-1988. |
| 10/4/1 | Waikanae land company 1972-1987 |
| 54/4 | Waikanae Land Company - 1972-1973. Application to Divert. |
| 12/2 | Waikanae Land Company - Application to Divert Waikanae River organise correspondence 1973-1982. |
| 53/0
Vols 1 to 3 | Waikanae Land Company. Evidence presented to the Water Right Application Tribunal Hearing. |
| 12/1 | Kapiti Borough General 1982-1987. |
| 49/12/KAP | Kapiti Borough Council Planning and consent matters |

2.3. ARCHIVE 3 : SCHEME WORKS 1955

Catchment Area: 48.8sqmi above SH1 in rural (grazing) use & in Native bush. The 5mi scheme reach (0.5mi u/s of the SH1 bridge and 4.5mi d/s) was described in 1955 as rural land with a beach resort. On the Nth bank area immediately below SH1 subdivision was fairly extensive and of an urban nature.

Reason For Initiation: Local residents requested the implementation of a flood and erosion control scheme following the 1955 flood. During this time Central Government was actively promoting schemes that would lead to the sound management of NZ's River Catchments. There was little impediment to the implementation of flood control schemes.

Prior to the 1955 flood the scheme was being adequately managed by the MCB through the construction of isolated works, funded by the local land owner with a subsidy from central government.

Flooding occurred on the Nth (right) bank over a 0.5mi length, at a point 2mi from the mouth (Greenaways Road area) with overflow moving into the urban area and into the Waimeha Stream. Flooding also occurred into rural land on the south bank at a point 3mi from the mouth, and inundated the lower areas of Buchanan's property before being confined by the coastal sand dunes.

The prevention of flooding into the Waimeha Stream allowed the urban development of a large area of swampy land. The second principle objective of the scheme was the improvement of the drainage of the Waimeha Stream and its pre 1922 outlet channel, the Waimeha lagoon and associated drainage ditches.

According to research undertaken by Chris and Joan Maclean for their publication "Waikanae Past & Present" surveys of Waikanae undertaken prior to 1896 indicate that the Waikanae River occupied two equally sized channels between the current "marina" and a point near the SH1 / NZR bridges. The 1896 survey shows only one channel.

Current aerial mapping does not show a clearly defined point of divergence for the "second river". The Korimiko end of Kohekohe Road is lower than the 1955 bed levels at the bridges but the only clear link across the railway embankment is through the eastern end of Karu Crescent, to a point just south of the timber yard or the old "Pit". Levels on the terrace below the Pit are lower than the terrace levels that used to form the bend immediately upstream of the rail bridge on the right bank.

Other records of the flooding of the Pit, and the flood damage to the building which occupied the site of the "Country Inn" restaurant, suggest this to be the most likely course. The transposition of last centuries surveys to form an overlay of the current topographical information would be a worthwhile and interesting exercise.

The only major events which occurred in the 1880 to 1890 period and which could have led to the permanent closure of the northern river branch was the construction of the Manawatu railway and the gradual improvements to the main highway. The former would certainly have led to the formation of a substantial embankment across this area. A search of the construction records for the railway (if they can be located) would also be a worthwhile study.

The third principle objective was to manage the river alignment to an overall plan. As the 1896 river centreline was a property boundary for the length of the river any diversion required the consent of several property owners. Although the alignment of the river has remained very stable a number of diversion cuts were deemed desirable to relieve pressure on problem areas. It was then common rivers control practice to undertake works which led to a deepening and channelization of the central channel. It is however notable that the problem areas identified on the 1955 scheme plan are identical to the areas causing most concern today.

Scheme Promotion: The scheme was promoted by the Manawatu Catchment Board under the provisions of the Soil Conservation and Rivers Control Act 1941.

Scheme Funding & Administrative Authority: Construction, immediate follow-up works and maintenance of the mouth alignment was subsidized through the Soil Conservation & Rivers Control Council at a rate of £2 subsidy for £1 local share. The local share was raised on the National Provident Fund. A classified benefit area was established and rated in order to fund the loan repayments, and later, the costs of maintaining the scheme.

Rating of the classified area continued until 1972 when the scheme area was absorbed into the

2.3. ARCHIVE 3 : SCHEME WORKS 1955

WRWB district. The rating provisions of the Soil Conservation & Rivers Control Act 1941 did not apply to the WRWB and so the classification was not maintained. Scheme funding was provided from WRWB levies on the LTA's. Subsidies continued to be received from NWASCO, although at a lower level and despite the WRWB lack of progress on a Scheme Review. Management was by way of the "Watercourses Agreement", a negotiated agreement entered into between the WRWB and the TLA's for the maintenance of rivers and streams in each TLA area.

In 1982 the Scheme area was transferred back the MCB district to again be managed under the provisions of the 1941 Act. Due to changes in property holdings and the desire to increase the area of benefit the 1956 classified area was not updated and classification commenced for a new rating district encompassing the entire Kapiti Coast from Paekakariki to the southern boundary of the Otaki Scheme, and including all the contributing catchment areas. To satisfy the requirements to receive National Water and Soil Conservation funding a review of the 1955 scheme was initiated. During the reclassification and review process, which continued until the area was again included in the Wellington Water District and until NWASCO funding was phased out in 1989, the scheme was funded as "Delegated" or "Isolated" minor works within the Manawatu Water District "Bulk Allocation" of subsidy monies for rivers control works. The unsubsidized portion of the maintenance costs was split between the KBC and the HCC by negotiated agreement.

The Manawatu Catchment Board bulk allocation was severely cut in 1989 and MCB interest in the promotion of "New" works was similarly reduced. In the last round of negotiations with the TLA's before the area was handed back to the WRC, the MCB suggestion was that all costs be carried directly by the TLA's. Presumably this may not have occurred had the area remained part of the Manawatu Water District as the MCB was replaced by the Manawatu-Wanganui Regional Council with wider rating powers.

In Oct 89 the scheme area was again designated part of the Wellington area. Scheme funding is from a Regional Rate. There is currently no special rate to reflect local benefit and there is no central government subsidy. A flood plain management plan is currently being developed for the entire Waikanae Catchment, and this may lead to changes in the scheme and the method of scheme funding.

Scheme Objectives: The summary of the Scheme objectives listed:

- The prevention of erosion.
- The prevention of flooding into the rural areas on the north and south banks.
- The clearing and maintenance of the Waimeha Stream.
- The improvement of the drainage of the Waimeha Settlement by improvements to the outlet of the lagoon.
- Maintenance of the mouth of the Waikanae.

It is likely that these scheme objectives were phrased to maximize the rate of subsidy likely to be awarded by the Soil Council.

With the exception of the left bank farmers, who were not suffering severe erosion or significant flood losses, the beneficiaries were all urban settlers who rapidly subdivided their landholdings following the completion of the scheme.

Scheme Area: The Waikanae River from the Mouth to the unformed road (approx entrance to the Waikanae Water Supply Intake (5mi).
The Waimeha Lagoon and outlet channel from the Waikanae River to Waimea Road.
The Waimeha Stream from the Mouth to a point on Te Moana Road just upstream of the Greenaways road intersection (approx 1.8mi).

**Proposed Works
(completed during the
56/57, 57/58, & 58/59
financial years)**

**Refer to figures 8 & 9,
pages 33 & 34:**

Stopbanking:

(left bank) 1m10c to 1m20c Otaihanga
(left bank) 2m70c to 3m50c Buchanan's - added to satisfy his objection.
(right bank) 2m5c to 2m60c Kauri, Puriri, Greenaways

Diversions:

2m25c to 2m45c Development of the "old" channel at Greenaways Road.
3m70c to 4m30c Small cuts and the development of existing preferred channels.
4m40c to 4m60c Development of an existing channel.

Rock Work:

(left bank) 1m10c to 1m20c Otaihanga.
(left bank) 4m10c to 4m12c Waterhouse.

Channel Improvements (blading and clearing):

2.3. ARCHIVE 3 : SCHEME WORKS 1955

2m0c to 2m20c, 3m0c, 3m60c to 3m70c,

Bank Protection:

Left bank: 1m25c to 2m5c (layering), 2m70c to 3m60c, 3m65c.

Right bank: 1m25c to 2m5c (layering), 3m to 4m30c

Drainage:

Waimeha Lagoon - enlarge the outlet channel & lower the lagoon by 18" approx.

Waimeha Stream - enlarge and deepen the channel from the mouth to 1m50c.

Waikanae Mouth Opening:

As required - opened 1955, 1960, 1965, 1971, 1976, 1984, 1989.

Land Acquisition:

Acquisition of a narrow belt of land along the rural reaches (predominantly the left bank) to permit the construction and maintenance of fences to prevent stock damage to the live protection works.

Design Parameters:

The river alignment was based on "Grant's Formula" but confirmed by aerial photography and fitted to the existing dominant features.

- Meander Length 19 - 23 chains (380m - 460m).
- Radius of Curvature 8 chains (160m).

The bankfull width was based on "Lacey's Formula".

- Bankfull width 100 - 130 feet (30m - 40m).

The stopbank levels were set initially .6m (2') higher than the pegged 1955 flood (24,000cusec, 680cumec) gradient. These were modified following the 1956 flood (especially in the Greenaways road area) and during the SC&RCC technical approval process a condition of funding was that the banks be designed to be .3m (1') higher than a 30,000cusec (850cumec) flood profile. It is not known if this alteration to the design levels was made as the design profile was latter referred to as the 30,000cusec plus 6" and as the original 24,000 plus 2'. It is possible than in some reaches an increase in stage of one foot could correspond to an increase in discharge of 6000 cusecs. It is probably the case that the levels were not changed, only the technical description.

The design discharge was based on the measured 1955 Otaki Flood discharge using the proportion of the catchments areas with the result reduced by 25% to allow for the lower altitude, sheltered position and orientation of the Waikanae catchment.

- Otaki 1955 Q = 2514cumecs.
- Area Waikanae 48.8 sqmi, Area Otaki 123 sqmi.
- Altitude Waikanae 600m - 760m, Otaki 900m - 1060m.
- Calculated Waikanae 1955 Q = 680cumecs.

The calculated Waikanae discharge was routed through the SH1 bridge opening for an estimated average velocity and was found to compare favourably with the 1955 flood observations. The design discharge was adopted as 24,000cusecs (680cumecs). As mentioned above this was increased during the Technical Approval stage to 30,000cusecs although correspondence after 1965 refers to the design discharge as 24,000cusecs.

Scheme Benefits: The 1955 report records the benefits to accrue from the scheme works as:

- 600 acres would benefit from erosion protection.
- 50 acres of built up land would be flooded if erosion was not prevented.
- 100 acres which flooded in Feb55 would be protected by stopbanking.
- 50 acres to benefit from improved drainage.
- The river controlled as a whole would benefit the whole district.

Cost of Works:	Capital Expenditure	Estimate 1955	Actual Total 1955-65
	Willow protection of eroding banks (110c at £35)	£3850	£6274
	Rip Rap protection	£1500	£2938
	Layering & Tying of Willows	£600	£844
	Planting of Banks and Nurseries	£800	£1512
	Bulldozing, clearing channel and	£1200	£1513

2.3. ARCHIVE 3 : SCHEME WORKS 1955

developing cuts

Stopbanking	£550	£3760
Poisoning & removing willows	£750	£395
Lowering and improving Waimeha Lagoon outlet 50c @ £9	£450	£1211
Improvements to Waimeha Stream 120c @ £5.10	£660	£993
Light fencing	£600	£2033
Acquisition of land & compensation	£700	£3437 plus \$2700 1967
Contingencies and Engineering costs	£1540	£140
Totals:	£13500	£25050 plus \$2700 1967

Maintenance

River Mouth annual allowance	£70
Lagoon & Waimeha stream	£100
Fences & layering	£100

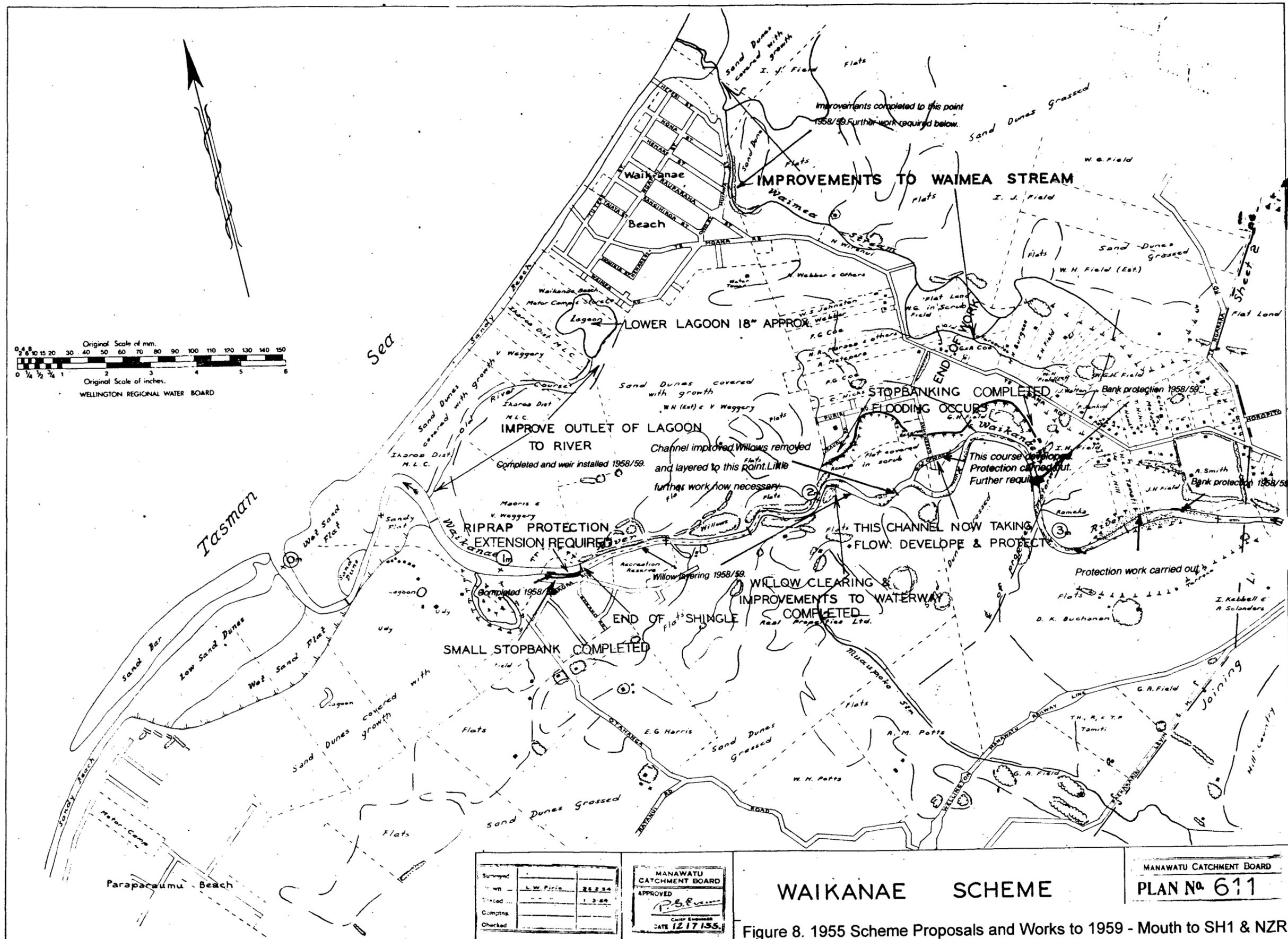
Extra Flood Damage:

Flood Damage

Scheme proposal estimated to allow per year average. The original scheme rating level was set for this sum, although it was presumably adjusted on a yearly basis.	£1000	16Oct59 £360 13Jan62 £1569 1968/69 \$1000 23Dec85 \$25,000 4Oct86 \$10,000
--	-------	--

Works Re-Estimates: Following the 1955/56 flooding a re-estimate of the works was made 20Jul56 which increased the estimate to £16350. The additional expenditure was for willow protection (to 120c @ £40), Rock work at Waterhouse (4m10c) £1500, land acquisition £300 and engineering £350.

Further re-estimates were delayed until the additional Buchanan stopbank was defined. In Oct59 the estimate was increased to £21,250. This was increased to £25050 in the 1960/61 program.



Original Scale of mm.
 0 5 10 15 20 30 40 50 60 70 80 90 100 110 120 130 140 150
 Original Scale of inches.
 0 1/4 1/2 3/4 1 2 3 4 5 6
 WELLINGTON REGIONAL WATER BOARD

Surveyed		
Drawn	L. W. Potts	22.2.54
Traced		1.2.59
Comptd.		
Checked		

MANAWATU CATCHMENT BOARD
 APPROVED
 DATE 12.17.55

WAIKANAE SCHEME

MANAWATU CATCHMENT BOARD
PLAN No 611

Figure 8. 1955 Scheme Proposals and Works to 1959 - Mouth to SH1 & NZR Bridges

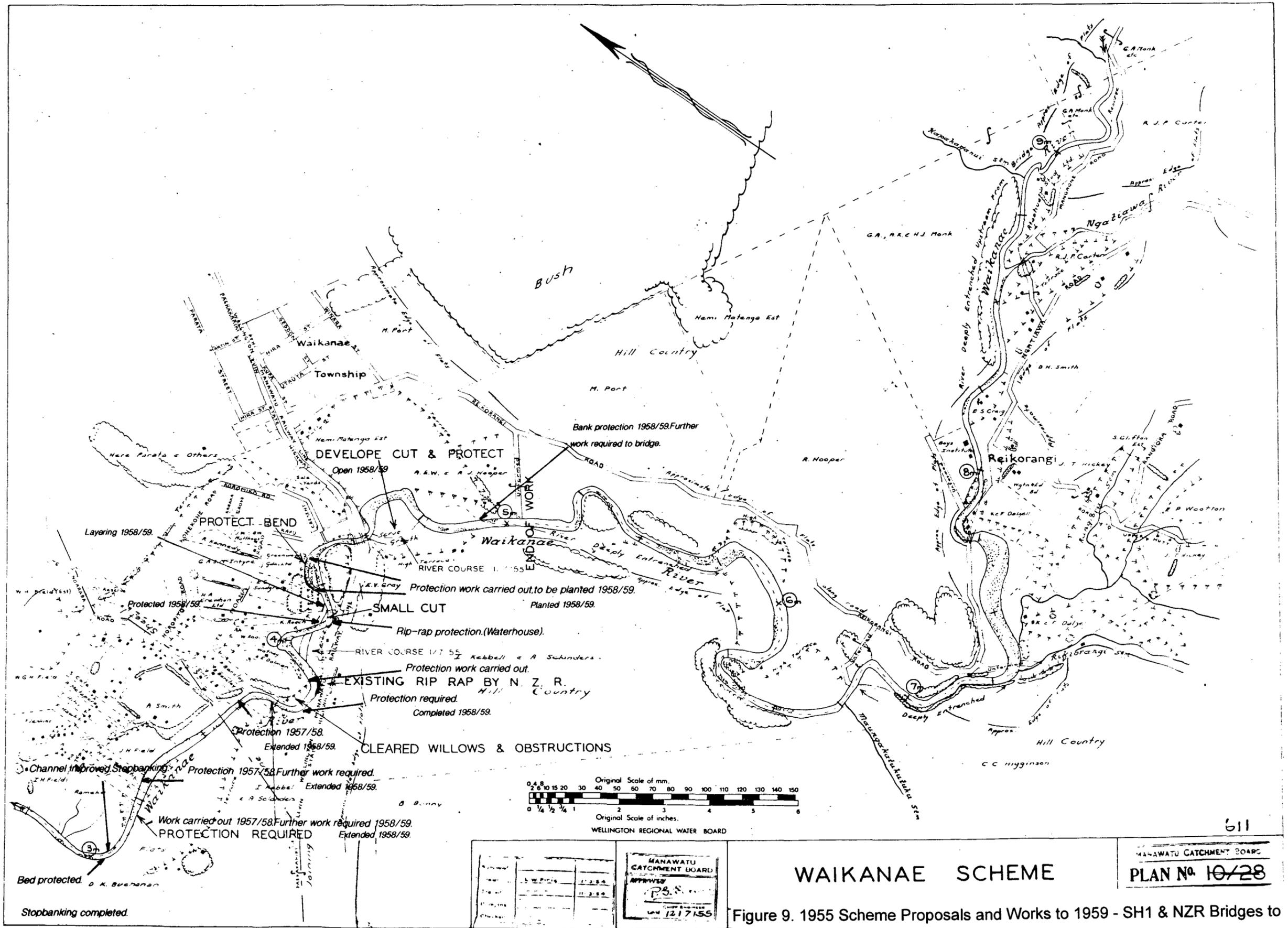


Figure 9. 1955 Scheme Proposals and Works to 1959 - SH1 & NZR Bridges to Reikorangi

2.4. ARCHIVE 4 : ANNUAL PROGRAMMES OF EXPENDITURE ON SCHEME WORKS 1954-67

£ of the day. (CCI)	56/57 £(186)	57/58 £(191)	58/59 £(199)	59/60 £(208)	60/61 £(215)	61/62 £(220)	62/63 £(223)	63/64 £(229)	64/65 £(245)	65/66 £(253)	66/67 £(265)
Willow protection of eroding banks.	435, rb, 3m40-4m25	950	684	575, rb 4m40-4m60	645	1141	1286	500	252 on general works		
Rip Rap (rock) protection	2081, lb 0m20-1m60 & 4m10 completed in 55/56	-	311, lb 1m10-1m15	-	-	-	46	500 SH1 bridge weir			
Layering and tying of willows.	258 1m10-2m50 3m0-4m40	145	74	-	83	10	22				
Planting of banks and nurseries.		37	247	368	309	230	286				
Bulldozer work to clear channels & develop cuts.	763 1m10-2m50 3m0-4m40	428 3m0-3m30 2m40	134 diversion 4m40-4m60	29	24	94	39				
Stopbanking.	462, rb 2m5-2m55 (intermittent)	3049 3m0-3m30	63	105	-	-	75				
Poisoning and removing willows.		42 3m-4m40	87	-	86	175	175				
Waimeha Lagoon lowering and outlet improvements.		-	1211, incl. weir const.	-	-	-	-				
Waimeha Stream improvements.		36	621 0m40-1m40	288	-	37	-				
Light fencing.		566	83	15	37	358	471	248			
Land Acquisition and compensation		216	46	368	-	26	36	644	2708 + 1350 to complete final land acquisition		
Contingencies & Engineering costs.	incl.	16	incl	70	71	-	-				
Totals	3999		3561	1818	1255	2073	2262	1248			
Construction Cost Index	186	191	199	208	215	220	223	229	245	253	265

2.5. ARCHIVE 5 : WAIKANAĒ RIVER SCHEME (1955-65)

Date	Summary of file entry.	File/Plan
1947-55	Small river works were carried out by the MCB on behalf of individual owners to control river erosion, under the "Minor River Works Scheme" subsidized by the Government through the SC&RCC. A small gap in the terrace at 2mi50ch had also been closed and the river mouth had been realigned in 1947 & 1955. The isolated works were mainly tree groynes and willow works associated with local channel diversions and realignments. The plantings were subject to stock damage and the realignments subject to outflanking due to their isolated and limited extent.	MCB rpt55
31Jul51	<u>Flooding</u> . A "good flood" in the river was responsible for minor damage but generally the flow improved the alignment and recent cuts.	10/2v1
Feb53	<u>Scheme Investigations</u> . Preparation of plans for the control of the Waikanae River.	Plan612
1954	Scheme Investigations. A description of Waikanae County Township was supplied to the MCB to form the basis of a Waikanae Scheme classification area.	10/12/E Plan625
21Feb55	<u>Flooding</u> . The river burst its banks at Te Moana Road and caused widespread flooding for a short period. Properties at Otaihanga were surrounded. Trees were uprooted and jetties and light craft were washed away. Banks were eroded. (discharge estimated to be 24,000cusecs (680cumecs).	10/2v1
22Feb55	A request from a local resident for the Chairman of the MCB to visit. "From time to time there have been rumours as to the intentions of your Board in regard to the control of the Waikanae River, but very little has been accomplished and the position is now very serious." Referred to the C.E. and the next Works & machinery Committee meeting.	10/12/E
12Mar55	<u>Scheme Promotion</u> . MCB attended a meeting convened by Mr Greenaways with 15-20 settlers and representatives of the Horowhenua County Council and Hutt County Council at Puriri Street & Greenaways Road. The purpose of the meeting was to impress on the Board the necessity for a flood and erosion control scheme for the Waikanae River. Recent damage and flooding had occurred in areas hitherto considered immune. The MCB made clear to the meeting: - Work on the Scheme proposals was nearing completion. - The area effected was to be classified and rated. The rates were likely to be high as the rating area was small. - Prior to the Scheme program approval and funding, only works on a private contributory basis would be carried out. ("Minor" works funded from the MCB "bulk allocation" of subsidy for the MCB district, with the property owner paying the unsubsidized portion).	10/12/E
23Dec55	<u>Waikanae Classification</u> . Classifier was Mr King of Masterton who also carried out the Otaki classification. - Draft classification completed 6Apr56. Adopted by the MCB 19Jun56. - One objection from Mr Buchanan who wished the stopbanking to include his south bank property (3mi).	10/4/E Plan628
11Jul55	<u>Waikanae River Report & Scheme Proposals</u> . Report by P.G.Evans, Chief Engineer MCB. Refer to Archive Table * for a summary of the report.	12/4 filed Sep73
20Jul55	<u>Scheme Submission for Funding</u> . Waikanae River Report submitted to the Chairman, Soil Conservation and Rivers Control Council following adoption and approval by the MCB 19Jul55. The submission included a recommendation to extend the Boards area to include all the areas of benefit - areas south of the current MCB (HCC) boundary within Hutt County.	10/12/E
17Aug55	<u>Scheme Approval</u> . SC&RCC approval of the Scheme subject to: - Technical approval before construction commences. - Design discharge to be increased from 24000 plus 2'freeboard to 30000 plus 1'freeboard. - A £2:£1 subsidy would apply to the estimate of £13200 and work done under the scheme would qualify for a 2 year follow-up subsidy at the same rate. Periodic mouth openings would also be subsidized at the same rate under the "Minor Works Scheme" if less than £750, and as for "Lake Openings" if over £750.	10/12/E Plan708

2.5. ARCHIVE 5 : WAIKANAĒ RIVER SCHEME (1955-65)

Date	Summary of file entry.	File/Plan
	<ul style="list-style-type: none"> - Maintenance would not be subsidized. Ordinary maintenance would have to be funded from rates. - Flood damage would be subsidized. - All land benefiting from the Scheme or mouth openings were to become part of the MCB. the MCB was to take up the extension of the District directly with the Local Govt. Commission. 	
4Jul56	<p><u>Restimate of Scheme Works</u>. Estimate increased to £16300. Increase due to:</p> <ul style="list-style-type: none"> - Willow protection up £950. Total 120ch @ £40/ch.. - Riprap increased by £1500 for work at Waterhouse's bank. - Land acquisition up £300. - Contingency and engineering costs up £350. <p>The Scheme was designed to protect urban properties only from flooding, although erosion protection was included for the entire "reach".</p> <p>20Jul56: Estimate of £16350 approved by SC&RCC.</p>	10/12/E
Oct56	<p>Plan of the position of the river bank in Oct56 in relation to lot5 D.P.17605 "Greenways".</p>	10/12/E
13Nov56	<p><u>Waikanae River Scheme Loan, 1956 - £5,500</u>. MCB resolution to raise a loan secured by a Special Rate in accordance with the classification. A poll was not demanded.</p> <p>Application to the National Provident Fund for the Waikanae Loan was turned down. 19sep56 MCB applied to SC&RCC to advance the funds. The application was declined and a loan was sought from State Advances. 6Nov56 the National Provident Fund approved the loan.</p>	10/12/E
18Feb57	<p><u>Public Meeting to explain Right Bank Scheme Works</u>. 20 effected property owners were advised of the Board's intention to proceed with the necessary work at the earliest possible date. A survey was being carried out and it would be possible to explain to interested parties the effect of the works at a public meeting to be held at Greenaways Road 25Feb57.</p> <p>The stopbanks would not exceed 3' in height.</p> <p>21Feb57: Letter advising 9 of the owners that the survey had been completed showing that their land was elevated above the proposed works. Unless they were interested in the general plan for the area they need not concern themselves further.</p> <p>(lists on file 10/12/E, 18Feb57 & 21Feb57).</p>	10/12/E
28Feb57	<p>Notice under section 137 of the Soil Conservation and Rivers Control Act 1941 of the MCB intention to construct the stopbanks, giving property owners one month to object.</p> <p>As verbal approval had been given by the property owners at the public meeting it was the MCB intention to proceed as soon as plant was available without waiting for the require notice, in the interests of the settlers.</p>	10/12/E
25Jun57	<p><u>1957/58 Estimated works program, refer archive table *</u>. £4800.</p>	10/12/E
10Aug57	<p>Section 137 notice sent to the effected property owners on the left bank. This notice must have followed previous advice as it included a left bank stopbank on Buchanan's property, not part of the original proposals, to satisfy Buchanan's objection to the original proposals. The stopbank apparently increased by 25% the level of discharge required to flood adjoining land.</p>	
3Sep57	<p><u>SC&RCC Technical Approval</u>. (Submitted to Porirua Residency) Granted subject to a satisfactory cross section detail being provided. In agreement to the inclusion of a stopbank on the right bank to protect Buchanan's property (2mi50ch).</p> <p>"As floods are of relatively short duration a relatively slender bank will suffice. Batters should be 2 to 1."</p> <p><u>MCB</u>. letter to property owners 2Aug57: "Spoil to build the banks will be taken from the</p>	10/12/E

2.5. ARCHIVE 5 : WAIKANAE RIVER SCHEME (1955-65)

Date	Summary of file entry.	File/Plan
	river side on both banks, but on the left bank spoil may be required from the sandhills."	
20Sep57	<u>Scheme Construction</u> . The works were apparently constructed using the MCB Otaki gang and dragline, and by using local contractors on a plant hire basis.	10/12/E
	Correspondence records the clock hours on the plant supplied by C.K.Brill, a Palmerston North contractor, who supplied a TD24 & TD18 tractor drawn scrapers.	
Feb58	Construction program running ahead of time and over budget: - More labour was available as less work was required on the Otaki Scheme. - Banking costs were greater than estimated due to poor ground conditions and long leads.	10/12/E
26Jul58	<u>Technical Approval</u> for the stopbanking 2m65 - 3m50. - Designed for 30000cusecs plus 6"freeboard. - Proposed to improve the river channel between 3m & 3m20 to give a minimum channel width of 2ch, with the excavated material used in the banks. - With the improved channel 12,000 cusecs will be carried in the channel without berm flow. - Refer plan 10/28 sheets 13,14,&15. Sheet 15 contains 1955 flood gradient.	10/12/E
26Aug59	<u>Revised Scheme Estimate</u> increased to £21,250 total. Approved by SC&RCC 29Oct59. The additional funds were required to cover the cost of additional stopbanking (£4,900), the Waimeha lagoon weir, and for follow up work over the next three to four years.	10/12/E
1972	Local government boundary changes transferred the Scheme to the WRWB.	MCB rpt69
1982	Local government boundary changes transferred the Scheme to the MCB.	MCB rpt69
1985	<u>Kapiti-Waikanae Scheme</u> . MCB proposal to upgrade the Scheme to 100yr.	MCB rpt69
1989	Local government boundary changes transferred the Scheme to the WRC.	MCB rpt69

2.6. ARCHIVE 6: WAIKANAЕ RIVER MONITORING

Date	Summary of File Entry	file/plan
1941/71	Waikanae flows monitored by the Wellington Suburban Water Supply at the water supply intake.	MC Brpt 69
1952	Station 31501 - Waikanae at SH1 Bridge, operated intermittently from 1952-74 by the MWD for the collection of National Water Resources. Data collected included flow measurements, staff gauge levels river bed samples.	
1967	Station 31502 - Waikanae at Reikorangi. Initially a slope/area reach operated by the MOWD and MCB between 1967 and 1975. Flow measurements, staff gauge levels.	20/11/6
1973	Station 31503 (N157: 615.687) - Waikanae at Akatarawa Road Bridge. Established in 1973 by the MWD for the Western Tararua Water Resources Survey mapping project. Used as a base station for the tributary gaugings. Operated between 1973 and 1975 recording continuous stage data and flow measurements.	
1975	Station 31504 - Waikanae at Water Treatment Plant. Established in 1975 by the Wellington Regional Water Board and has operated from 1975 onwards. Data collected; continuous stage data, flow measurements, temperature measurements.	
21Nov83	The stability of site 31504 disturbed regularly by activity associated with the maintenance of the intake at the WTP. The construction of a 150mm weir consisting of driven rails and timber whailing planned by the MCB.	10/4 plan 2510
Dec83	Plans of replacement tower and slackline cableway including a long section of the monitoring reach and details of the proposed bed control weir, site 31504.	Plan 2510
21Mar84	Construction of bed control weir, site 31504	Site audit DSIR 1990
12Jun84	Weir dismantled, site 31504	"
3Dec84	Piles for Weir installed, site 31504	"
31Jan85	Weir Constructed, site 31504	"
23Dec85	Weir destroyed, site 31504	"
1986	MCB used South Waiotaura rainfall station for information on the Waikanae (Station EO5913 Automatic)	MCB rpt 69
C.1989	C.D.C.B. employed <u>Chas Page</u> to create synthetic data for 31504.	
May90	Data Audit for Station 31504. Period 3 Mar 1975 to 31 Mar 1990. Water Resources Survey, DSIR Marine and Freshwater, May 1990.	
Sept90	Report on computer modelling to confirm the rating for station 31504. River backwater routing from 410m downstream of the weir to the WTP weir.	N/6/11/10
21Feb91	High Stage Discharge Rating Site 31504, Hydrology Centre DSIR. Contains; - EVI on the West Coast (Waikanae, Otaki, Ohau) - Hydraulic analysis of WTP "weir" - new flood frequency analysis. - cross sections at 31504 - Annual maxima at Waikanae	

2.7. ARCHIVE 7 : WAIKANAE FLOODING

Date	Summary of file entry	file/plan
1924	Flooding resulting in the loss of the "creamery" which once stood on the current site of the Country Life restaurant	Alexander Turnbull library photo
31Jul51	Reference to "good flood". Erosion, but general comment that the flood had improved recent cuts and done minor damage.	10/2 VI
Feb55	<ul style="list-style-type: none"> - From Upper Mangahone (daily raingauge) 21 Feb 55, 72 hr, 210mm 28 Feb 55, 48 hr, 189mm - Floods accompanied by high sea conditions well above normal astronomical tides. - Flood levels surveyed (currently no record). - 'Extensive' flooding of Kauri, Puriri, Greenaways and Te Moana Roads flowing into the Waimeha stream. Floodwaters entered houses causing 'extensive' damage. - Flood level R.L.5.317m at Kauri Street. - Girls Brigade Property at Te Moana Road damaged. - Article Kapiti Observer 3 Mar 55, "Trees uprooted carrying away jetties and light craft. Properties surrounded by water for a brief period. Banks eroded. - Estimate at the time 24,000 cusecs (680 cumecs) - At Waikanae many houses were flooded. - MCB prepared a flood map. 	<p>MCB rpt 69</p> <p>10/2 V1</p> <p>N/6/11/10</p>
May55	Floodwaters covered Kauri Road and the western area of Puriri Road.	MCB rpt 69
21Apr56	<p>Flooding estimated by residents slightly lower than Feb 55.</p> <ul style="list-style-type: none"> - Provisional estimate 23,000 cusecs (650 cumecs). - Severe erosion Otaihanga, 4.5 - 6m deep by 3m high over 300m. - Serious erosion near the mouth. - Minor surface damage to roads where tributaries flooded across. Several large slips. - At Reikorangi two fowl houses, a cowbail and a garage was washed away. A small unoccupied house was removed before its foundations were eroded. - At Waikanae many houses were flooded. - MCB prepared a food map. 	10/12/E
15May56	<p><u>Report to SC&RCC</u></p> <ul style="list-style-type: none"> - Below SH1 bridge on the right bank two properties (Ballantyne & Sundgren) lost attractive bush and a way was opened to the old river channel which caused flooding inland. Anchored tree protection for 120m was required but the pressure had been lessened by a cut made by the Waikanae Shingle Company. - On the left bank waterhouse lost 3m from an 8m high bank over 40m. - At Greenaways road, lawns and gardens were flooded as were 'some' houses. Silt was deposited. <p><u>SC&RCC Response Suggested</u></p> <ul style="list-style-type: none"> - Possible to do advance work. - find a way to speed up classification - MCB re-estimate the scheme cost before starting on the scheme construction. 	10/12/E
16Oct59	In letter to SC&RCC MCB describes flood of 16 October 1959 as the largest since the scheme was started. It caused some damage to unconsolidated tree protection works.	10/12/E

2.7. ARCHIVE 7 : WAIKANAĒ FLOODING

Date	Summary of file entry	file/plan
5Dec59	Flash flood damaged groynes upstream of the State Highway bridge. Repaired by MWD.	10/12/E
9Dec59	<u>SC&RCC</u> Approval for 1959 flood damage of £320	10/12/E
17Apr61	Flood combined with high tide. Largest since the scheme started, combined with a high tide causing level to be high at Otaihanga. There was no damage to the 'existing' works but there were several new places where protection work was required.	
13Jan62	Flooding on the 13th and 14th January 1962. <ul style="list-style-type: none"> - With 225mm of the top of the Stopbank at #45 Kauri Road (MCB comment "due to normal consolidation this part of the bank is too low"). - 15m of 'embankment' washed away at Bradley's - "Westernesse, Main Road, Waikanae. - Changed course at Greenaways Road and Washed away part of the reserve and Chillingworth's property. In the Greenaways Road subdivision water rose to 450mm from the lowest part of the bank. - Damage at Otaihanga, Makora Road, estimated at £500. - Repaired by Hutt County Council using hillside rubble faced with rock. - Flood damage total £1,568 	10/4V2
26Apr66	ANZAC day weekend. (flood peak recorded in Hutt at 4:30am 26 April 1966). 3½ acres lost upstream of the bridges.	10/4
3May66	Two Floods occurred entering houses at Otaihanga.	MCB rpt 69
8Aug66	<u>Otaihanga Progressive Assn</u> Deep concern regarding the condition of the river after three floods in recent weeks. <ul style="list-style-type: none"> - heavy shingle deposits. - log and debris. - bank erosion. <p>13 Sept 66: Inspected by SC&RCC. Complaints exaggerated. Asked MWD to dump surplus from roading to fill the eroding parts and build up the small stopbank if material was available.</p>	10/5
April68	(record from MCB report 69 - may be incorrectly recorded possibly flood of April 66); <ul style="list-style-type: none"> - Stopbank at Otaihanga had been practically overtopped on numerous occasions proceeding this flood. Subsequently raised by 0.45m - At Greenaways subdivision the flood topped the western section of the Kauri Road area stopbank. Subsequently the stopbank was raised 0.45m. - Flood damage claimed 1968/69, \$1000. 	MCB rpt 69
10Aug76	"Three typical foods occurred covering the berms below the terrace/escarpment/stopbanks at Puriri and Kauri Roads to depths of 1.2-1.5m."	MCB rpt 69
17Jul80	Highest recorded since records started in 1975. Staff gauge 9.2, approximately 200 m ³ /sec. (During one flood between 1980-82 the owner of the 'Larkin' house located on the berm abandoned the house by boat. At this stage the flood had not left the active channel 1km upstream).	10/4V7
4Nov83	Flooding 4 & 5 November 83 causing erosion at Greenaways Road.	10/4
23Dec85	Flooding causing approximately \$25,000 damage. Peaked at the highway bridge at 5:30pm approx. At Greenaways road the levels had dropped .3m by 7pm.	10/4V8 49/12/KAP V4
4Oct86	Flooding. Extensive damage of river banks from SH bridge to Otaihanga. Following this, general concern was expressed from many riparian owners over the maintenance of the river and the methods employed by the M.C.B.. Included a complaint to the Ombudsman by the owner of property in the Greenaways Road area.	10/4V8

2.7. ARCHIVE 7 : WAIKANAЕ FLOODING

Date	Summary of file entry	file/plan																
	<p><u>6 Mar 87</u>: Following combined inspection with the KBC, the Horowhenua United Council and the MCB it was agreed to allow an extra \$10,000 in the 87/88 budget to finance cross blading works from the mouth to Greenaways Road, 50% to be met by KBC & HMC.</p>																	
1986	<p><u>"Kapiti - Waikanae" Design Flood</u> Following consideration of the recorded data the 1955 flood was adopted by the MCB engineering and planning staff as the "Design Flood" for the proposed scheme and for the purpose of the building and subdivision bylaw controls.</p> <ul style="list-style-type: none"> - 9 years of records considered part of a decade of "relatively benign" weather. - difficulty in gauging higher flood discharges due to the short concentration time of 1.5 to 3 hrs. - From consideration of past floods there appeared to be sufficient evidence to suggest that extreme events have higher values than indicated by the present analysis. <p>Using the provisional high stage rating curve, the frequency analysis predicted:</p> <table border="0" style="margin-left: 40px;"> <thead> <tr> <th style="text-align: left;">Return Period (years)</th> <th style="text-align: left;">Flow (m³/sec)</th> </tr> </thead> <tbody> <tr><td>2.33</td><td>157</td></tr> <tr><td>5</td><td>203</td></tr> <tr><td>10</td><td>241</td></tr> <tr><td>20</td><td>277</td></tr> <tr><td>30</td><td>298</td></tr> <tr><td>50</td><td>324</td></tr> <tr><td>100</td><td>359</td></tr> </tbody> </table>	Return Period (years)	Flow (m ³ /sec)	2.33	157	5	203	10	241	20	277	30	298	50	324	100	359	MCB rpt 69
Return Period (years)	Flow (m ³ /sec)																	
2.33	157																	
5	203																	
10	241																	
20	277																	
30	298																	
50	324																	
100	359																	
1986	<p><u>Hydrographs</u></p> <p>Between 1975 - 1985 hydrographs typically of short duration with a time of concentration of 1.5 to 3hrs with single stage peaks.</p> <p>The floods of 1976, 1980 and 1982 show multiple peak hydrographs of 24-48 hours duration suggesting the extreme events are part of a different rainfall population.</p>	MCB rpt 69																

2.8. ARCHIVE 8: LOW FLOWS, ABSTRACTION AND THE WAIKANAЕ WATER SUPPLY

Date	Summary of file entry	file/plan
Feb28	Lowest recorded flow in Waikanae was assessed at 0.6 cusecs per sq mi from a gauging by H.L. Hume.	20/11/12
Feb70	Gaugings taken during the drought of summer 1969-70. Details on file 1Sept74.	10/4 V4
20Jan73	Investigation by Beca Carter Holdings and Ferner Ltd into a water supply scheme for Kapiti Borough and to look at potential long term storage options. - seeking water level and hydrological data.	20/11/12
1975	<u>Draft report of the Water Resources of the Waikanae Catchment.</u> B de Jonge. WRWB containing plans and descriptions of the upper Waikanae catchment. Contains summary of low flow gaugings and correlations undertaken by the MWD. - A base station (#3) was established at the Akatarawa Road Bridge (Station 31503, N157:615.687 rating curves 5Oct73 - 25Mar75, 1975 considered unstable). most tributaries were gauged and correlated against station #3. - WRWB carried out additional gaugings at site #4 (31504 at WTP), #5 (Mangaone Road Bridge) \$ # 7 (Ngatiawa, Mangaone Road). - Low flow estimated at WTP 526 l/s (10mgd)	10/4
	<u>Water Rights to Abstract</u> <u>760037</u> (Waikanae water supply) 263 l/s <u>70058</u> 100,000 gpd (5.26 l/s) or a maximum of 20% of the low flow of the Ngatiawa River (5.63 l/sec) <u>70061</u> 20,000 gph (25.25l/s) or a maximum of 5% of the Waikanae at the Akatarawa Road Bridge (16 l/sec).	
	<u>Proposed Restrictions</u> <u>760037</u> to receive priority during times of low flow. Restrictions to apply to the residual flow only.	
1941-71	Waikanae low flows maintained by Wellington Suburban Water Supply.	MCB rpt 69
1972-76	West Coast water Resources Mapping Project. MWD correlations established to determine mean annual flows for water allocation purposes (used by the WRWB and MCB).	
1974/75	Construction of the Water Supply Treatment Plant and intake weir commenced in 1974/75. The plant was commissioned in 1977.	
1978	Operational Survey 252; WRWB, undertaken to provide data for a Water Allocation Plan.	
1979	Allocations for Water Abstraction Waikanae. - Allocated Surface Water Takes 0.455m ³ /Sec - Groundwater extraction 0.008m ³ /sec - Discharges insignificant.	MCB rpt 69
1983	Bulldozing work upstream of the water supply intake to maintain a flow towards the intake opening. Bulldozing on 7Jan83, 7Feb83, 24June83, 30Aug83, 22Nov83, 10Dec83. Degradation of the downstream channel (as a result of weir overflow caused scouring beneath the weir sill, with low flows bypassing the intake, beneath the intake weir.	Sit Audit DSIR 1990
12Aug83	Water supply intake weir under scour. Approval sought from MCB for proposed repairs. Proposal included driven piles and whalings upstream of the intake weir sill to form a concrete curtain below the weir sill, land to place rock on the downstream face. Approved. 9Sep83 - Additional advice from MCB to make the downstream rock massive. 22Dec83 - KBC approved proposals 21Feb84 -Repairs carried out for an estimated cost of \$23,000	10/4
1987/89	Bulldozing carried out to maintain low flows towards the intake opening 11Jan1987, 28Mar1989	Site Audit DSIR 1990

2.9. ARCHIVE 9 : CAPITAL AND MAINTENANCE WORKS WITHIN THE SCHEME BOUNDARIES

Date	Summary of file entry.	File/Plan
Note	All works built within the scheme area received a £2 : £1 subsidy until the late 60's. Prior to the scheme the local share was raised by the property owner. Thereafter the local share was provided by scheme rating based on a general benefit classification rating area. Prior to 1955 Each work was covered by a separate subsidy application. After 1965 general scheme maintenance was processed as isolated works with the scheme paying the local share, presumably to avoid the restriction of no subsidy funding of maintenance works.	
1947-48	Erosion control works at Leong, Weggery, Dolman, and Kebbles properties. Total cost £174.10.8. River diversion along the four properties. Owner to plant willows following diversion works. Dolman broadcast wattle seed before the river "washed back to where it was before the diversion".	10/9/E
19Feb48	Request from H.C.C to provide an outlet to "Weggery's" lagoon, Waimeha Beach Township.	10/9/E
28Mar48	Diversion cut upstream NZR bridge, estate "R.Hooper" dec'd, £70. Also to add one more tree groyne to work carried out in 1947.	10/2v1
16Sep49	Willow work associated with minor diversion, "Ballantynes" at "Greenways" opp Waikanae Shingle Co. plant.	10/2v1
30Sep49	Small works at "Buchanans" opp Nimmo Ave. West. Residents Otaihanga complained.	10/2v1
25Mar50	Planting at "Simmons"	10/2v1
2Jun50	Small works on properties "Fields, Hill, Watanes", 3mi, £150	10/2v1
24May51	Erosion Hemi Matenga estate, r.b. upstream NZR bridge, £100	10/2v1
1955	Waikanae Shingle Company sought permission to build stopbank to prevent the erosion of their stockpile. Permission refused on the basis of restriction to channel. Illegal bank formed of sand filled drums to be removed to line set by MCB.	10/12/E
22Feb55	Erosion Otaihanga. Estimate for rock repairs £600. Residents advised that any work built prior to the proposed scheme would require local contribution. MCB applied for subsidy for stand alone work.	10/12/E
Dec55	Rockwork at Otaihanga. Local owners contribution £325. Rock placed by MWD. Follow up work £35 20/12/55.	10/12/E Plan703
22Feb56	Request from Ballantyne, owner of "Greenways" to correct river alignment to prevent further r.b. loss. MCB advised to wait for scheme. Ballantyne would not contribute local share on an earlier occasion. Work desirable but not urgent.	10/12/E
25Jun56	Otaihanga. Rockwork to repair damage 1955/56. 1m.20ch. 4ch rockwork estimated to cost £780. Rock obtained from Otaki & Paraparaumu mixed with local rock at a ratio of 3 local to 2 Otaki.	10/12/E
9Oct56	Rockwork to protect NIMT and Kebbles. A small return to be added to existing NZR rockwork and to be extended 70m to protect Kebble. NZR place rock supplied free by MCB at Manawatu siding. Kebble contributed £25 to the cost of rock. By 3May57 180 tons placed.	10/12/E
Jul56	Plan of protection works proposed for "Waterhouse", 4m 10ch.	Plan798
13Mar58	More rock required behind Otaihanga Boat Club.	10/12/E
Apr63	Erosion at Kebbles Bluff. 5ch. protection works, £180. Follow up work 14Oct63	10/4
7Aug64	General scheme maintenance £400	10/2v1
27Apr65	Otaihanga. Severe scour upstream of boating club.	10/4
11Sep67	NZED power pylons, Nimmo Ave. River realignment, reclamation and rockwork. \$1815 paid for by NZED.	10/4v3

2.9. ARCHIVE 9 : CAPITAL AND MAINTENANCE WORKS WITHIN THE SCHEME BOUNDARIES

Date	Summary of file entry.	File/Plan
28Mar68	Otaihanga. Request from HCC for MCB to prepare a scheme for an embankment and rockwork to protect Otaihanga. HCC prepared to pay 50% of estimated \$1000. Rockwork for 3ch downstream of old boat landing ramp. Stopbank to connect with the access to the boat harbour.	10/4v3 Plan1589
12Jul68	General trench planting within the scheme, \$1000	10/2v2
Nov68	Kebbles Bluff erosion. Invest. shows only 30 perches lost in 14 years. MCB not prepared to do anything unless Kebble prepared to pay \$1000 of \$4000 estimate. NWASCO approved 3:1 subsidy 6Feb69.	10/4
29Jun69	General trench planting of willows, \$1500.	10/2v2
28Jul70	General bank planting, 70/71, poplar & macrocarpa, \$900	10/2v2
Jan71	Land acquisition, "Wilkin & Chillingworth" east Greenaways Rd, \$300	10/2v2
19Oct71	NZED pylon. Tree protection 4ch. Rockwork 50 cu yds.	10/4v4
16Mar72	Agreement with Waikanae Shingle Co. for improvements to the channel alignment and the removal of metal. WSC contributed 1/3 total cost of \$1350.	10/2v2
20Feb74	General scheme works for WRWB. 160ch channel works, 20ch berm planting, 6ch rockwork, 8ch tree protection. \$4800	10/2v2
Jun76	Drainage improvements behind stopbank l.b. 2m 60ch to 3m 15ch. "Howarth ex Buchanan"	Plan2431
21Jul76	Request to remove snags by Otaihanga Progressive Ass.	10/4v5
July76	Bank erosion Karu Cres to Sunny Glen Reserve. Bulldozing completed Aug76.	10/4v5
Aug80	NZED power pylons. WRWB recommend relocation of pylons. NZED prefer to protect structure. Works involving realignment and hard protection, \$6000.	10/4v7
Aug80	Christian Holiday Camp. Two areas of erosion. In the lower reaches near facility cross blading and planting carried out. In the upper reach river allowed to erode.	10/4v7
1Oct80	Request not to cross blade during the whitebaiting season	10/4v7
5May81	Plans of right bank abutment protection works for SH1 bridge	10/4v7
4Feb83	Kebbles Road erosion. MCB intention to place rock groynes and renew willow planting. Rock groynes placed by MCB on r.b. 100m upstream.	10/4
30Mar83	Otaihanga. to protect eroded areas of river bank reserve with rounded boulders and silver poplar plantings.	10/4
30Mar83	Christian Holiday Park. Intention to construct a guide bank to divert floodwater away from the sewage treatment plant	10/4
23Sep86	In response to a formal complaint re river management in the Greenaways Road area by Messrs Pike & Blake. Advice to Minister of Works: - Channel shaping Greenaways Road to SH1 Feb83 - Shaping 0.5km west Greenaways Rd to SH1 Nov83 - Shaping 0.5km west Greenaways Rd to 1 km west SH1 bridge Feb85 - Shaping to SH1 with exception of Pike/Blake (following objection) Sep86	10/4v8
11Feb88	Complaint re demolition concrete in the river. Response from MCB "escalating cost of quarry rock have had to discontinue use".	10/4v8

2.10. ARCHIVE 10 : SHINGLE MANAGEMENT

Date	Summary of file entry.	File/Plan
1956	To date royalties from shingle extraction went to the Land Department" - approximately £1000 was received in 1955.	10/12/E
10Apr56	Reference to work undertaken by the Waikanae Shingle Co. upstream of the "dragged" area using a dragline dredge.	10/12/E
20Apr56	<u>Waikanae Shingle Co (WSC).</u> - Considering increasing plant capacity. - Necessary to obtain further extraction areas. MCB advice requested.	10/12/E
27Nov58	<u>Application for "Metal Permit".</u> Jensen, 5mi20ch working from Hooper's property, right bank. Application declined: - Scour at railway bridge. - Scheme works include a small cut above the bridge and bank protection on the right bank to 4mi65ch with willow planting to 5mi5ch. - Land titles go to the river centreline. The landowner on the opposite bank was opposed. - extraction plant in this locality "not in the interests of the Scheme".	10/12/E
Dec58	<u>PWD extraction, Reikorangi.</u> 10,000 cuyds removed without consent of the MCB. MCB advised PWD that consent was required for further extraction. PWD required a further 6000cuyds. 13Feb59: License issued to Jensen to extract 7500cuyds for the PWD contract. MWD instructed that they require MCB approval before letting contracts for the extraction of metal from the Waikanae River.	10/12/E
13Jan59	Request from WCC to the MCB to control extraction upstream of the proposed water supply intake. MCB advise that they can only stop extraction for rivers control and soil conservation purposes - not to protect a water supply intake.	10/12/E
9Sep59	WSC estimated volume of extraction for the period 1Jul59 to 30Jun60 was 36,000cuyds.	10/5/1
22Jul60	PWD application for 30,000cuyds for highway construction south of the SH1 bridge. Application declined.	10/4
24Sep62	MWD application for 20,000cuyds for road construction 1mi south of the Waikanae Rail crossing. Consent granted by the MCB chairman.	10/4
5Apr63	Reikorangi property owners (through the HCC) concern that metal deposits had built up to the level of the road.	10/4
17May63	Complaint from resident that the extraction activity by the WSC and the MWD has lowered the river bed and forced residents to drill deeper wells. MBC replied that the MWD extraction had no effect on bed levels. Wells had proved inadequate because of 3 dry years with no floods.	10/12/E
25Mar70	<u>WSC Lease.</u> Prior to 1958 the Company was removing shingle by license issued by the Lands and Survey Department. In 1958 the terms and conditions to extract from Crown Land now vested in the MCB were continued by the MCB. Copy of 1969 lease. 5 year term with further rights of renewal. License fee \$200pa + \$20 fee. Royalty 10c/yd payable after the first 2000 yds taken (presumably cover by the license fee). Renewed 1Jul69.	10/5/1
Apr70	<u>Pollution.</u> - Waikanae classified under the Water Pollution Regulations 1963 by the Pollution Advisory Council. - WSC issued a temporary right to discharge washwater on 24Apr70 on condition that treatment works to meet the discharge requirements were installed and operating by 31Mar71. - Golden Bay cement Co issued a permit to discharge 20Mar70. required the	10/4v4

2.10. ARCHIVE 10 : SHINGLE MANAGEMENT

Date	Summary of file entry.	File/Plan
	<p>maintenance of the existing settling ponds.</p> <ul style="list-style-type: none"> - Pollution Advisory Council insistent that the two extractors (WSC at SH1 and Golden Bay Cement Co near the mouth) wash water discharge conditions be met in the classified bathing waters. - Treatment works (settling ponds) to be maintained so that the effluent did not discolour the receiving waters at a distance greater than 10yds from the outfall. - MCB reaction to complaints was that the discolouration was caused by the movement of bed material and was not due to the introduction of foreign material into the river. Such discolouration took place naturally with every fresh. current concern aggravated by the lack of recent flooding. Generally regarded the interests of the "scheme" to be paramount to other (part time and casual) river users. 	
24Feb71	<p><u>Douglas Metal Div. Golden Bay Cement Co.</u> Located on the left bank on Hadfield's property, 2mi, just d/s Greenaways Road area. Operated under a permit to remove shingle from privately owned property. MCB ensured that the removal followed good river engineering practice. For the then current activity which included carting quarry material to the Waikanae river to be washed, the MCB required the installation of settling ponds.</p>	10/4v4
27Apr71	<p><u>Meeting MCB & WSC.</u></p> <ul style="list-style-type: none"> - Extraction down to a hard clay pan in the license area. - WSC has entered into arrangements with private owners in Reikorangi. - MCB advised WSC that restrictions were likely to be imposed because of the general degradation of the bed. <p><u>Meeting MCB, MWD, NZR.</u></p> <ul style="list-style-type: none"> - Concern over degradation beneath the road and rail bridges (see archive file *). - MCB proposed the construction of a gabion bed control weir. - MCB considered that WSC could still take the metal that moved over the weir. - MCB contended that as a result of the Board's work degrading would have occurred irrespective of the activities of the shingle company - "there had been no floods or severe freshes in the Waikanae River for some years and consequently the metal was not coming down as it had done in the past". 	10/4
19May71	<p>NWASCO refused to subsidize the bed control weir built by the MCB at SH1 on the basis of MCB mismanagement of the extraction operations. (Reading between the lines MCB continued to permit extraction in the belief a flood would occur and replenish the supplies. This continued until they found themselves in an embarrassing situation. On their part NWASCO were concerned that the MCB were mining the river for revenue).</p>	10/4
29Dec71	<p>Complaint re the effects of dredging the river for the entire length from the Main Road Bridge to Otaihanga.</p>	10/4v4
14Feb72	<p><u>MWD.</u> Re complaints about pollution from washwater in the Waikanae River. Asked what the MCB as a water board was going to do about it.</p>	10/4
19Sep72	<p>MCB response to a complaint re discolouration.</p> <ul style="list-style-type: none"> - Effluent inspected and while not perfect was of reasonable quality. - To remove all colloids altogether would impose economic difficulties on the companies concerned. - An approach will be made to the company to improve the quality. 	10/4
13Mar72	<p>Extraction as part of river works undertaken by the MCB and WSC as an isolated work.</p> <ul style="list-style-type: none"> - 8000cuyds removed adjacent to the NZED power pylons from two beaches, "B" 6000cuyds and "C" 2000cuyds. Area "B" to be removed within two months and a reasonable channel formed in area "C". - Permission already granted to work area "A". - Referred to plan 24/10/2. 	10/4
26Mar74	<p>Inspection of Deposits.</p> <ul style="list-style-type: none"> - WSC area only metal available at the top end of the excavation. Site in good condition. - Golden Bay (Otaihanga, Hadfield's 2mi). Shingle becoming scarce. Site in good condition. - Reikorangi (Port's). 13May74 extractors digging too deeply. 20Aug74 gradient steep. 	10/5/1

2.10. ARCHIVE 10 : SHINGLE MANAGEMENT

Date	Summary of file entry.	File/Plan
	Extraction to be permitted only above water line.	
1July74	Golden Bay (Waikanae Shingle Co) license renewed for 5 years.	24/7
c.1974	Golden bay abandoned the crushing operation and dismantled the plant due to the small volume of material available for extraction.	MCBprt69
17Jul74	WRWB Shingle Committee to meet as soon as possible to discuss the situation on the Waikanae River. As a result the WSC advised that they could take no more metal until there was clear evidence of surpluses.	12/2
4Oct74	WRWB refused permission to Goodman Contractors to remove metal from WRWB land adjacent to Howarth's property for farm track surfacing on Howarth's property. WRWB claimed almost exclusive rights to available metal had been guaranteed to Golden Bay (now owners of Waikanae Shingle Co.). Shingle was in short supply and should be used for aggregate production.	10/5/1
10Feb75	All sites inspected by G.Gray. No metal available for extraction.	10/5/1
19Aug75	No current licenses for extraction. No metal available for extraction. Evidence that the river in the lower reaches was degraded.	10/5/1
17Feb76	Permission for GB to extract. - NW of old Otaihanga plant to 300mm below water level. - NE of plant to water level. - East of road and rail bridges on Kebbles property, two beaches between the WTP and the bridges to be removed to water level.	24/7
15May76	Complaint from Port (Reikorangi). Since 1970 when several cuts were made with a dragline (river diverted & willows planted) regular extraction has taken place in 1971, 1972, and in 1973 to 250m past the Reikorangi Bridge. Since the WRC took over extraction had been "banned".	10/5/1
18Jun76	Reikorangi, Port. metal extraction refused 11May76 on the basis of cross section surveys showing no surplus.	10/5/1
3May78	Reikorangi, Port. Shingle taken by Culley construction for aggregate.	10/5/1
15May79	Reikorangi, Raymer. Extraction to stockpiles beside the main road by Golden Bay.	24/7
1Jul79	Golden Bay License due for renewal. Although a draft document was prepared it was not completed. This was partly due to a lack of incentive/shingle volumes and partly due to the WRWB intention to increase the royalty rate to 90c/cm. (Generally opposed by all extractors incl. those in the Hutt Valley. Eventually a base rate of 65c/cm for the year ending Mar79 was agreed with inflation adjustment thereafter. The rate from Jul81 was 82c/cm). 19Jun84: MCB resolved to give Golden Bay first option to remove metal (required for rivers control purposes).	24/7
14Jul79	Greenaways Road. Extraction (by John McLaughlan for GB and Colin Smith for River Properties, the land owner). GB in the process of working down the river removing surpluses at the direction of the WRWB overseer.	24/7
6Mar80	Reikorangi, extraction.	24/7
27May80	Concern over silt loadings resulting from extraction and bulldozing during low flows.	24/7
24Jul81	Reikorangi, Port. Agreement for extraction.	10/5/1
3Aug81	John McLaughlan extracted 1158cu.m.	10/5/1
16Nov83	Schedule of land ownership on the Waikanae. Prepared for MCB following hand over from the WRC.	24/7
7Mar86	Application by Port to extract. Consent declined. Request to Horowhenua United Council for a change in its Regional Scheme to	10/4v8

2.10. ARCHIVE 10 : SHINGLE MANAGEMENT

Date	Summary of file entry.	File/Plan
	prohibit general shingle extraction from the Waikanae River.	
1986	<u>Kapiti-Waikanae Scheme investigations.</u> - Based on the estimated Otaki bedload supply of 6000 - 14000 cm/year by proportion of 100year peak flows the Waikanae annual bedload supply estimated to be 960 - 2240 cm/year. - Degradation over a 2000m reach downstream of the SH1 bridge averaged 2m. - Degradation over a 800m reach upstream of the SH1 bridge averaged 1.5m. - Estimated loss in bed material 126,000 cm.	MCBrpt69
13Dec87	Reikorangi, Port. Request to extract declined.	10/4v8
29Mar88	Reikorangi, Port. Request to extract declined.	10/4v8
11Jan89	Reikorangi, Port. Application for planning consent by Kapiti Quarries to KBC to permit extraction from Ports property on a twice yearly basis with the extracted material stockpiled clear of the river. File contains reference to MCB correspondence between KBC and HUC (Sep87) covering the reasons for a general prohibition of extraction from the Waikanae River. Includes a comment that within a year or two metal extraction for rivers control purposes is likely within the Waikanae Scheme Area. The hearing was cancelled after the application was withdrawn (presumably following KBC informal advice to Kapiti Quarries that they were wasting their time).	

2.11. ARCHIVE 11 : SHINGLE EXTRACTION RECORDS

Year	Volume (cubic metres)
1940-57	Extraction managed by the Lands Department; no records available.
1957-58	15000 removed from 2m5 to 2m40 as part of the scheme works channel development. Extraction 3m0 to 3m30c for the construction of the Buchanan stopbank.
1958-59	13400, PWD, Reikorangi
1959-60	WSC estimate 28,000
1960-70	estimated 8000-13000 per year.
1960-75	100,000 + 160,000 (from GB and WSC?)
1960-61	no record
1962-63	16,000, MWD, at SH1.
1963-70	no records
1970-71	Reikorangi, extraction, Port.
1971-72	6700 Reikorangi, extraction, Port.
1972-73	8000+ , WSC, centred at power pylons. Reikorangi, extraction, Port.
1973-74	6864 Reikorangi, Port, extraction.
1974-75	22397
1975-76	3269 from area of GB plant, Otaihanga and east of road and rail bridges at Kebbles.
1976-77	2689
1977-78	8917
1978-79	12603 Reikorangi, extraction, Port by Culley for aggregate
1979-80	5146, surpluses d/s SH1 Reikorangi, extraction, Port Mar80 & Raymer May79. Both by GB.
1980-81	1506
1981-82	1158, GB, d/s SH1 Port's, Reikorangi, extraction.
1982-91	no records

2.12. ARCHIVE 12 : WAIKANAE WEIR AT SH1 & NIMT BRIDGES

Date	Summary of file entry.	File
07Mar58	<u>NZR</u> advice of intention to protect bridge piers by placing rock to build up the bed. Scour exposed hardwood piles beneath conc. cap.	10/12/E
10Jul59	<u>NZR</u> 1930 w.l. 6.55m below rail level. 1959(winter) w.l. 8.08m below rail level. To protect piles necessary to raise level to 7.47m below rail level. Propose rock weir downstream of the bridge. <u>MCB</u> Bed must not be raised above 7.32m below rail level and erosion downstream of the weir must be controlled by NZR.	10/12/E
Dec59	<u>MWD</u> Propose to form a sheet steel weir 600mm higher than present bed level. Only a minimum acceptable 1.98m remaining anchor on the SH1 bridge piles. <u>MCB</u> Sought support from SC&RCC. MCB did not want a permanent weir as it would prevent the upstream reach from degrading. MCB would prefer the replacement of the bridge (apparently needed). MCB would tolerate a 300mm weir on condition it was removed following the speedy replacement of the bridge.	10/12/E
03Oct62	<u>MCB</u> Erosion on the left bank downstream of the weir constructed by the MWD. Rock to prevent scour supplied by MCB and placed by MWD.	10/4
23Nov62	Maintenance cross blading at the weir.	10/4
23Dec64	<u>MCB</u> Request MWD to remove weir following completion of the replacement SH1 bridge and removal of the temporary Bailey bridges (refer to plan dated 1962 filed as first entry on file 10/4 vol 5). <u>NZR</u> Request that the weir remain for a further 5 years (to June 1966) to permit the alteration of their abutments to suit the new SH underpass. <u>MWD</u> Advise weir will be demolished after June 1966.	10/4
Jul66	<u>MCB</u> Weir removed.	10/4
30Mar71	<u>MWD</u> Reference to discussion with MCB 11Feb71 re construction of a bed control sill.	10/4
31Mar71	<u>MCB</u> Request quote from Soil Stabilisation Ltd. for gabion weir. pan 1775	10/4
20Apr71	MCB form sub committee to consider construction of a weir to control bed degradation at the SH1 & NZR bridges.	10/4
27Apr71	Meeting on site MCB, NZR, MWD. Degradation greater than expected. MWD consider degradation due to over extraction. MCB consider degradation an objective of their river management to increase flood capacity. Degradation would have occurred regardless of extraction. Accelerated rate due to lack of floods and associated bed load movement. General agreement that a "sill" will control bed levels to protect the bridges, with extraction continuing to remove material passing over the sill. Proposed cost sharing 20% NZR, 20% MWD, 60% MCB.	10/4
May71-Jul71	Rock apparently dumped across the river.	MCB rpt69
03May71	<u>MCB</u> Request for 2:1 subsidy for the construction of the weir. <u>MCB</u> Order placed for the supply and construction of a 3' weir, 200' downstream of the SH bridge.	10/4

2.12. ARCHIVE 12 : WAIKANA E WEIR AT SH1 & NIMT BRIDGES

Date	Summary of file entry.	File
19May71	<u>NWASCO</u> Subsidy application declined on the basis that the benefit will accrue to the NZR & MWD and the works are due to over extraction. Work should be financed from shingle revenue.	10/4
27May71	<u>NZR</u> Reference NZR plan D.E.21169 (not on file). Concrete filled steel piles are founded 3.66m into solid rock.	10/4
09Jun71	<u>MCB</u> Request to Marine Department for fish pass requirements.	10/4
11Jun71	<u>MWD</u> Withdraw financial support for weir on the basis of <u>NWASCO</u> decision.	10/4
01Jul71	<u>MWD</u> to DCW advising that due to the hardness of the rock the SH bridge piers were not founded the full .76m into hard material hence the resistance to horizontal shear is less than desirable. Absolute max degradation permitted should be 5' below the original bed level of approx R.L.60'. As built plans on file. This advice conveyed to <u>MCB</u> 12Jul71. R.L.55' referred to as 8' below the top of the steel casing on pier D, 100' from the south abutment. <u>MCB</u> not advised of reasons.	10/4v5
20Jul71	<u>Marine Dept</u> advise that fish pass is required. Observe that <u>MCB</u> is in breach of the regulations. At the time no water was flowing over the weir.	10/4
20Jan72	<u>MCB</u> gabion mattresses ordered (apparently to repair weir).	10/4
29Jun72	<u>Marine Dept</u> consider weir illegal structure and ask for plans for approval.	10/4
19Jul72	<u>MCB</u> do not consider Waikanae River navigable in this reach. No approval required. Plan 1775 supplied.	10/4
Sept72	Large conc blocks placed in river bed.	MCB rpt69
21Dec72	<u>MOT</u> consider weir clearly hinders navigation ... (<u>MCB</u>) shall be liable for indictment for nuisance, encroachment or obstruction...	10/4
07Nov73	<u>MWD</u> advise <u>WRWB</u> that weir partially breached in Labour weekend floods. Please arrange repair. <u>WRWB</u> sought advise from <u>MCB</u> , <u>MWD</u> , and <u>NZR</u> re the need for the weir.	10/4
10Dec73	<u>NZR</u> supplied bed level survey for 1930, 08Sep58, 01Jul59, 15Mar60, May71. The bridge had been underpinned however <u>NZR</u> considered it essential for the bed to be retained at its present level.	10/4
Jan74	Rock placed on the weir abutments.	MCB rpt69
Mar74	Rock placed on the weir abutments.	MCB rpt69
01Apr74	Survey of <u>NZR</u> & SH1 cross section, SSP plan <u>WRWB</u> 177. Note by <u>WRWB</u> Chief Engineer that bed level 150mm above the minimum, the weir had been repaired and 100 tons of rock placed below it.	10/4
01Oct74	Photographs of weir on file.	10/4
Jan75	Photograph of <u>NZR</u> bridge on file 10/4 Jan76.	10/4
12Sep75	Photograph of weir on file.	10/4

2.12. ARCHIVE 12 : WAIKANAЕ WEIR AT SH1 & NIMT BRIDGES

Date	Summary of file entry.	File
	WRWB memo refers to cost sharing arrangements for Bulls Bridge - NRB agree to all costs for works 400m upstream and 100m downstream and 50/50 share for works 400-800m upstream. Proposed an approach be made to NZR & MWD for cost sharing for the Waikanae weir.	
10Dec75	<u>WRWB</u> invitation to Ground Engineering to quote for the supply of gabions for a new weir 12m upstream of the existing.	10/4
16Jan76	<u>Ground Engineering</u> details of proposed weir and quotation.	10/4
08Jan76	<u>WRWB</u> advise NWASCA that the existing weir is not repairable. Consider NZR & MWD should fund replacement weir. Propose a concrete block weir founded on reno mattresses with the blocks secured to a deadman cable. NWASCA opinion on proposal sought	10/4
02Feb76	Photograph of weir on file.	10/4
26Apr76	<u>NWASCO</u> questioning the need for the weir and indicating subsidy support only if a community benefit can be shown.	10/4
18Jun80	<u>MWD</u> Advise that the bridge seismic resistance is below code requirements. Require the maintenance of the bed level. A low cost weir would be acceptable provided there was a commitment to repairs being made within a 6 week period. Without this commitment a weir that can withstand the 100 year flood must be provided.	10/4
08Sep80	<u>WRWB</u> Recent flood damaged weir (random tied concrete block). Weir reinstated. With reference to MWD bridge stability report (on file) a meeting of all parties suggested.	10/4
01Sep81	<u>MWD</u> Hold <u>WRWB</u> responsible for the maintenance of the bed level at R.L.55'.	10/4
07Oct81	<u>WRWB</u> Following meeting with NRB,NZR,MCB,WRWB, advise MWD that the <u>WRWB</u> will continue to maintain the rubble weir and the general alignment of the river but will not undertake other works directed at protecting services.	10/4
29Sep83	<u>MWD</u> Porirua Residency to undertake immediate works at MCB expense to protect the bridge and are to undertake investigations for the long term protection of the bridge.	10/4
26Oct83	<u>MCB</u> Subsidy funds are not available for the protection of roads or bridges. Works require approval from the MCB but are the financial responsibility of the MWD.	10/4
1986	Further works proposed by MWD	MCB rpt 69
21 Dec 84	MWD proposed for a rock weir to replace for existing pyramid block weir constructed in 1985 for a cost of approximately \$120,000, funded by the National Roads Board and currently in a servicable condition.	plan 2803

2.13. ARCHIVE 13 : WAIMEHA STREAM.

Date	Summary of file entry.	File/Plan
c.1921	<p>The stream was diverted directly to the sea through a low point in the sand dunes to allow the development of the Waimeha Township subdivision by H.W. Field who owned and farmed the coastal strip north of the Waikanae River. The residual cut off section remained to form the Waimeha Lagoon. the lagoon outlet channel was enlarged in 1970 to form the "Marina", by the then owners the Waikanae Land Company.</p> <p>The coastal strip was dominated by large (10m high) shifting sand dunes until they were stabilized by Field using marram grass imported from Australia. Refer "Waikanae Past & Present", Chris and Joan MacLean.</p> <p>The present mouth has developed since the diversion.</p>	
12Apr45	<p>MCB assistance requested from the Waikanae Beach Progressive and Ratepayers Association to control the southerly movement of the mouth.</p> <p>The Association had cut the stream through to the sea and repaired the old groyne c.1944, but the work was destroyed during the first spring tide.</p> <p>The Association attributed the original diversion to the County who later drained further areas into the stream and built the groyne which then fell into disrepair.</p>	10/2v1
1955	<p>Waikanae River Scheme. The Waimeha Drainage was included in the river scheme as urban development of the land between the Stream and Te Moana road was envisaged and drainage improvements could be made.</p>	1955 Scheme Report.
30Jul55	<p>Waikanae Town Board request to MCB to realign the mouth to prevent erosion of the southern sandhills.</p>	10/12/E
1958	<p><u>Scheme Works</u>. Channel enlargement from 0ch to 67.5ch. Bed width 10', gradient 1 in 1056, side slopes 1.5 to 1, velocity 2'/sec, Q = 50cusecs. carried out as part of the Scheme program from 1958 to 1960.</p>	Plan932
9Mar59	<p>Waikanae County Town Committee request to remove weed and logs. Dragline sent in Mar59.</p>	10/12/E
22Apr59	<p><u>Waikanae Subdivisions Ltd</u>. Nth side Te Moana Road, west Park Ave. Approval of drainage easement in favour of MBC.</p>	10/2v1 Plan960
30May61	<p><u>Howse Subdivision</u>. Park Ave. Diversion of the Waimeha to improve the subdivision. Initially not permitted as the diverted section gradient was considered too steep, but later approved.</p>	10/4 Plan1136
29Jul61	<p>Mouth realignment requested.</p>	10/4v3
16Feb62	<p>Mouth realignment requested.</p>	10/4v3
21May62	<p>Maintenance easement in favour of MCB detailed.</p>	10/4v2 Plan1383
10Jan63	<p>Abnormal weed growth. Weed sprayed and mechanically removed with weed bucket.</p>	10/4
6Mar63	<p>Bridge approval (approx 12'span).</p>	10/4
27Mar64	<p>Request to clear weed. Sprayed.</p>	10/4
1964-1966	<p><u>Howse Subdivision</u>. Correspondence leading to the approval of the waterway requirements for the subdivision.</p>	10/4v2
25Oct66	<p>Howse. 16ch of the stream cleared as a Board Approved subsidised work, £600.</p>	10/2v1
12Aug68	<p>Mouth realigned, \$200.</p>	10/4v3
20Aug68	<p>MCB submitted weedicide to the Wildlife Division of the Dept of Internal Affairs & Marine Dept. for approval for use in the Waimeha Stream.</p>	10/4v3
3Oct68	<p>Following overspray damage within Te Moana Market Gardens MCB instructed the overseer to discontinue the use of hormonal sprays near nurseries and market</p>	10/4v3

2.13. ARCHIVE 13 : WAIMEHA STREAM.

Date	Summary of file entry.	File/Plan
	gardens. "Paraquat" to be used in these areas.	
15Nov68	Proposed diversion in the vicinity of the bowling greens, Huiawa Street.	10/4v3
29Jul69	Waimeha Mouth stabilization No.2. Extension of the existing (deteriorated) breastwork. bundles of manuka brushwork was tied to the works to for a permeable groyne over a distance of 5ch. \$200.	10/4v3 & 10/2v2
3Jul70	Mouth realigned, \$120.	10/2v2
Jan72	Weed cleared by dragline. On file 23Jun75.	10/4
9Mar72	Request to carry out maintenance clearing outside the whitebait season.	10/4
2Nov72	Diversion. 5ch diversion and backfilling of old channel. Local share HCC & MCB Waikanae Scheme. refer 15Nov68 above. \$3200.	10/2v2 Plan1790
Dec72	Weed cleared by dragline. On file 23Jun75	10/4
5Dec72	Subdivisional Approval. Lots 1, 2, & 3, D.P. 23746. Te Moana Rd & Huiawa St.	10/4
28Mar73	Mouth stabilization. 3ch boulder protection (prob. right bank d/s Field Way bridge. \$400.	10/2v2
13Sep73	Diversion, Te Moana Road, J.F.Dixon. Approved WRWB.	10/4
Dec73	Weed cleared by dragline. On file 23Jun75	10/4
Nov74	Weed cleared by dragline. On file 23Jun75.	10/4
15Feb80	Mouth dune erosion. Photo 1980.	10/4v7
Oct82	Stream Survey. Long section, plan, and cross sections.	Plan2439
3Feb83	WRWB procedure for the injection of diquat for the control of weed growth. MCB comment that there was no water right to cover the injection.	12/1
24Jan84	HCC request for weed to be cleared.	10/4
Nov85	Silt discharge . During the laying of the natural gas pipeline and HCC roading works the dewatering water was discharged directly to the Waimeha Stream. The water contained a high sand content which was deposited in the stream invert, leading to a significant increase in bed level. Discharges were thereafter passed through a settling tank before discharge to the stream. The contractors removed the stream deposits.	10/4v8
5Dec85	Stream clearing. Complaints from whitebaiters. MCB stated that the weed growth was causing unacceptable water levels and could not have been left till the end of the season. Stream clearing during the school holiday period was avoided as rotting weed was deposited at the mouth after each clearing.	10/4v8
1986	Waikanae-Kapiti Scheme Investigations. Waimeha Abstractions. - Allocated surface water takes 0.003cm/sec - Allocated groundwater takes 0.005cm/sec - Discharges 0.023cm/sec	MCBprt69

2.14. ARCHIVE 14 : WAIMEHA AND WAIMANU LAGOONS.

Date	Summary of file entry	File/Plan
1955	Waikanae Scheme Report. - Winter water levels restrict surface drainage of the properties along the north of Waimea Road. - Survey & report to be completed before the lagoon was lowered.	MCB 1955rpt.
27Apr56	Further requests to improve Lagoon outlet following flooding of 21Apr56.	10/12/E
23May56	<u>Fauna Protection Advisory Council.</u> - Lagoon habitat for protected water fowl and was an unspoiled swamp. Concern over the effect of lowering the water level. MCB replied that the lagoon drainage could be removed from the Waikanae Scheme but the responsibility for the associated maintenance and flooding would have to be transferred to the Dept of Internal Affairs. It should be possible to arrive at a compromise. Scheme proposes: - To enlarge 1.5mi of the outlet of the Waimeha Stream channel. - To open the outlet of the lagoon to lower water levels 1.5' or more.	10/12/E
3Aug56	Minutes of site meeting, MCB, Dept Int. Affairs. - The lagoon and the fall from the critical drainage areas to be surveyed. - MCB considers the interests of those classified within the scheme as being paramount (the local property owners as distinct from the "Bird Lovers"). - Wildlife Division of the opinion that the lagoon has characteristics not duplicated in the Wellington Provincial District. Any significant lowering will result in the lagoon's virtual disappearance. - "In the short term at least the operations of the MCB must run counter to the idea of the preservation of wild life". - The area was classified and there was pressure to "prosecute the scheme with all expedition".	10/12/E
11Sep56	Waikanae Motor Camp (owner of land on which the lagoon was located). Would claim compensation for damage to property if MCB proceeded with the lagoon lowering.	10/12/E
19Sep56	SC&RCC advised that the MCB would be carrying out an investigation of the lagoon because the "lowering of the lagoon is causing considerable lamenting from Bird Lovers and others outside the area effected".	10/12/E
5Oct56	Levels of Lagoon Taken 1948-51. - Lagoon 0.46' lower in Mar48 than in Jun55. - Lagoon 0.62' lower in 1951 than in Jun55.	10/12/E
5Oct56	Report on Waimeha Lagoon. - Future of lake should be decided as soon as possible. Future development will pollute the lagoon and an option may be to completely fill it in. - MCB resolved to proceed with the proposed scheme works.	10/12/E Plan852
11Dec56	MCB advice to Forest and Bird Soc.. - Engineers report indicates a lowering of 3" would suffice for drainage purposes. - MCB was prepared to lower the lagoon to the full 18" mentioned in the Scheme Report if the lesser lowering did not have the desired effect.	10/12/E
29Jan57	Levels within the drainage system.	10/12/E
19Sep57	Proposed Works and hydrological design. - Regrade and enlarge the outlet drain, lowering the bed level. - Fix the level of the lagoon at RL 6.45' as the lowest level to which the lagoon will fall (lowest summer level 18Feb57). - Construct a concrete weir structure. Rise and fall depending on the flow of 6". - Necessary for the County Township to enlarge the culvert beneath Waimea Road and to improve drains upstream. SC&RCC. - Advise a delay to lagoon outlet improvements until the upstream drainage work is carried out and the effect of the improvement observed. - Discuss the improvements on the ground with the Internal Affairs and Health Depts.	10/12/E

2.14. ARCHIVE 14 : WAIMEHA AND WAIMANU LAGOONS.

Date	Summary of file entry	File/Plan
23Dec57	Letter explaining proposal and seeking objections from effected residents and from "Maoris" through the Dept of Maori Affairs. Dept advised MCB that the Maori owners would probably wish to object as part of the land was a cemetery and provided the addresses of the principal owners. File note from MCB C.E. to Area Engineer "doubtful if you need do much more". No record of the individual Maori owners being contacted.	10/12/E
15Jul58	<u>Dept Int Affairs.</u> - On 10Jul58 50-67% of the lagoon area was clear of surface water, much below the summer low. MCB reply 17Jul58. - Level was slightly higher than agreed. - Birds seem to be quite happy. - Doubtful if they can do anything further about the water level. Locals claimed the level was nowhere near the summer low. The local fire-fighter's summer wells were useless.	10/12/E
1Dec58	<u>SC&RCC.</u> - Water level to be maintained at a higher level by fitting a flash board to the weir. - Thereafter neither MCB or SC&RCC will be responsible for drainage. - Lagoon matters to be passed on to D.I.A. for adjudication. - DIA Wildlife branch to gazette lagoon as a wildlife reserve. <u>MCB reply. 13Dec58</u> - Will not divest responsibility for the drainage of a classified area. - Flashboard installed to determine if the level could be raised without effecting drainage.	10/12/E
14Mar61	Lagoon weir sandbagged. (note: there was apparently a battle between the locals who wished to keep the levels low (in the belief that it improved their property drainage) and those who wished to retain the lagoon at a high level to preserve the habitat. The weir was vandalized and the flashboard removed on several occasions).	10/4
Apr63	Weggery Subdivision. Approval sought for the installation of two 30" pipes in the outlet channel.	10/4
18May65	HCC report on the future of the lagoon with respect to local subdivisions.	10/4v2
29Jun65	Weggery Subdivision Plan.	10/4
Aug66	Appeal by Waikanae Beach Motorcamp (objection 29/17) to the area surrounding the lagoon being zoned "existing reserve" in the District Scheme Review. Appeal disallowed. HCC District Scheme Review #1, described the area surrounding the Lagoon as "existing reserve". By objection 33/45 this was changed to "proposed reserve" with an underlying zone residential. The zoning was to provide interim protection as the Crown had indicated its interest in acquiring the land for a wild life reserve. (Proclamation published in the NZ Gazette no63, 22 Oct 59 vol III p.1502 made pursuant to sec14 Wildlife Act 1953. Describes an area of 32 acres). In the decision to disallow the appeal the following comments are made - In 1966 the reserve area was approx 5 acres. No proclamation revoking or amending the original had been gazetted. The proclamation of 1959 appears to have taken advantage of the wildlife act although the DIA supports retention of a wildlife reserve.	10/4
18Sep68	By 1969 the whole of Waimeha Lagoon and the land surrounding it on the north, east, and south banks had been purchased by the Crown for retention as a wildlife reserve. land on the western bank had been taken by HCC as reserve allocation during final subdivision of lands owned by the Waikanae Beach Motorcamp and Store Co Ltd.	10/4v3
17Mar71	Realignment of the drain and filling of the old drain over 3ch undertaken as a subsidized work. \$200.	10/2v2
14Feb72	Letter from Fleming suggesting improvements to the Lagoon.	10/4

2.14. ARCHIVE 14 : WAIMEHA AND WAIMANU LAGOONS.

Date	Summary of file entry	File/Plan
	<ul style="list-style-type: none">- Flashboard disappears causing the lagoon to dry out and weed growth to spread.- Suggests progressive lowering of the lagoon to match the weir level, and the removal of the weed in an attempt to establish a stable habitat. <p>MCB suggested meeting of interested parties which led to Dept of Lands and Survey reminding the MCB that the lagoon had been purchased by the crown with the management of the whole domain vested in the HCC. letter 13Apr72.</p>	
27Feb72	<u>Dept of Internal Affairs</u> . Management proposals for the Waimeha lagoon.	10/4
10Jan73	<p>Agreement on methods for managing the lagoon.</p> <ul style="list-style-type: none">- Provision for fire breaks every 15-20' around the periphery.- Deepening of the lagoon by 8" overall (prob. depth of flashboard).- Provision of walks and hides.- Investigation for an artesian water supply to refresh the waters in the lagoon.	10/4
15Mar75	Outlet channel to the "marina" cleared.	10/4
1984	Drain dug around the lagoon to improve the upstream drainage without effecting the water level within the lagoon.	MCBrpt69

2.15. ARCHIVE 15 : WAIKANAЕ RIVER MOUTH

Date	Summary of file entry.	File
	All works built within the scheme area received a £2 : £1 subsidy. Prior to the scheme the local share was raised by the property owner. Thereafter the local share was provided by scheme rating based on a general benefit classification rating area. Each work was covered by a separate subsidy application, and in some cases general scheme maintenance was processed as isolated works with the scheme paying the local share.	
prior1947	File note by P.G.Evans. From a local resident: - New mouth opened about 1930 (or a little earlier). - Again just before the war, prob. 1938. - Between 1930 & 1938 another attempt had been made but was unsuccessful.	10/4/v1 May60
19Dec47	River eroding north Paraparaumu. Cut put through in adverse weather conditions. Only partially successful. Proposal prepared for SCRCC consideration to build a low stopbank to prevent the southerly drift and to direct flow through the cut - 3600cuyds of sand with a scrub mattress cover. Fresh in Jan48 fully developed the cut and further work was postponed. 15Mar48 application to SCRCC for £2 for £1 subsidy on the original work. Local share collected from Hutt County Council.	10/7/E
May48	Mouth moved approx 100m south.	10/7/E
25Feb49	Southerly mouth movement. Paraparaumu residents wish to have a wall groyne built. MCB consider southerly movement will be slow but formal works will be required in the near future.	10/7/E
1955	Wind set up caused a wash across Ocean Beach Road (Otaki) similar to the 1976 storm when a combined stage of RL 5.8m msl was observed.	MCB rpt69
c.1955	Mouth opened by private contractor.	10/4/v1
1955	Waikanae Scheme Report. From past experience mouth realignment unlikely to be required more than once every 5 years. Infrequent realignment preferred to permanent works.	MCB rpt'55 Waikanae Scheme
5Oct59	"Terris", landowner and developer to the south of the river mouth, concern over southern and inland river alignment. Consent and advise sought for resiting the present channel near the beach instead of along the foot of the "solid land". Terris was proposing to construct a marina-type subdivision on 160 acres of estuary frontage.	10/12/E
8Dec59	"Terris", first stage of subdivision approved by HCC. Engineers Brickell/Smith. Require MCB advice on next (water frontage) stage.	10/12/E
24May60	"Terris", further request to open mouth.	10/4/v1
c.Jun1960	Mouth opened in adverse tides and westerly conditions. Cost £946.4.6.	10/4/v1
1Mar64	"Terris", request to cut mouth. River eroding his land to the south. MCB. Proposal prepared and referred to SCRCC. Quotes called Nov65 and quote for £500 accepted 14Dec65.	10/4
30Aug64	Photometric contour plan of estuary.	Plan1835
25Feb71	<u>Waikanae Land Company</u> . Water Right application # 117 granted (right 710072) for the construction of exploratory works to determine the feasibility of establishing and maintaining a northern river position and navigable marina opening. Period 12 months. MCB reserve the right to divert or to stop any work on the proposed mouth that could have a detrimental effect on the Waikanae Scheme. WLC to satisfy objectors conditions before right issued.	53/0v1
c.Jul71	Mouth opened by Waikanae Land Company and exploratory works constructed including sand filled drums, railway iron breastwork, warratahs and netting, brush mattresses and embankment construction.	53/0v1
25Aug71	<u>Marine Department</u> . To MCB. Works at mouth without authority. File Note: Chief Engineers understanding;	53/0v1

2.15. ARCHIVE 15 : WAIKANAЕ RIVER MOUTH

Date	Summary of file entry.	File
	<ul style="list-style-type: none"> - MCB has a delegated authority (from the Marine Dept.) to open the mouth. - MCB advises the Dept. so that a navigation warning can be issued. - Authority required for works on tidal land subject to sections 176 to 182 of the Harbours Act 1950 (in part. sect 178). <p><u>MCB</u> advised Marine Dept. that it did not give authority for the work.</p>	
7Sep71	<u>Hutt County Council</u> to Marine Dept. Approval for WLC works obtained by County Engineer, application 29Jan71, approval 2Mar71, advice of commencement of works 27Jul71.	53/0v1
10Sep71	<u>MCB</u> gave notice of intention to instigate proceeding against WLC for proceeding with mouth opening without MCB approval. MCB legal advised the case would be lost on the basis of being trivial.	53/0v1
16Nov71	<u>MCB</u> Right to divert the mouth of the river and to carry out exploratory works granted 16Nov71 for a period of 9 months. A further application required before permanent works are constructed.	53/0v1
16Aug72	<u>Waikanae Land Company</u> made an application for the right to set the mouth of the Waikanae River in a permanent location. (Note the construction of the marina on the outlet channel of the Waimea Lagoon was approved under a separate water right, applied for in Jan70). The permanent works partly conceived and presented as follow up works to prevent the loss of the embankments constructed as temporary works. MCB reaction of qualified approval was on the basis of preventing the unnecessary loss of capital works while retaining the right to require modification or removal, and accepting no financial liability for ongoing maintenance. Plan R115/1 on file.	54/4 Plans 1703 & 1830
	Over 10 objections were received mainly on the grounds of the intrusion into a natural space and on the difficulty of maintaining a fixed outlet. The MCB Water Committee recommended that the application and objections be heard by a special tribunal. Tribunal was held 5Feb73 and recommended the application be approved. The tribunal recommendations were then further considered by the WRWB with conditional approval granted 11Jun73. Technical approval for the final works was not obtained before the company went into receivership.	
15Feb72	<u>MCB</u> Request WLC to remove temporary work, rusted drums etc..	10/4/1
25Aug72	Complaints that work by WLC to extend Tutere Street resulting in dune erosion and loss of marram grass.	10/4/1
Sep72	Plan on file showing areas of accretion and subdivision in the southern estuary area.	10/4/1
4Sep72	<u>MCB</u> instruction to WLC to clean up mess of temporary works.	10/4/1
14Sep73	Minister of Works made a requirement pursuant to sec21(7) Town and Country Planning Act 1953, that an area of approximately 50 ha at the estuary of the Waikanae River be designated in the relevant district planning schemes as "Proposed Recreational and Wildlife Reserve".	12/2
20Apr74	Photograph of river mouth held on file.	10/4v5
24May74	Water right 740032 to divert Waikanae River in favour of WLC.	12/2
20Jul74	Photographs of Waikanae River mouth.	12/2
26Sep74	Dragline deepening WLC marina channel and modifying the breakwater. WRWB ordered work stopped until WRWB approval obtained.	12/2
4Dec74	Photograph of marina.	12/2
12Feb75	From 1975 all reaches of the river severely depleted of shingle. Extraction permitted only for "Rivers Control Purposes".	MCB rpt69
	Extraction had deepened the active channel in most areas including the mouth by up to 2m. Continued aggradation within the mouth is expected.	
5Dec85	MCB use 3.7m above m.s.l. as the design flood level at the mouth. Due to wave run-	10/4v8

2.15. ARCHIVE 15 : WAIKANAE RIVER MOUTH

Date	Summary of file entry.	File
	up. Backwater calcs on file.	
Dec1976	<p>Cyclone 500-700km west of Cape Egmont. Winds 50km from the NW. Swells of 10-12m. Barometric pressure dropped to 970mb.</p> <p>- wave run-up in Estuary over-topped the Waikanae Land Company left bank embankment, RL 3.2m msl. Max level of the run-up approx RL 3.6m msl.</p> <p>- sea level observed as 2.6m above normal driftwood line along the Raumati - Paraparaumu coast.</p> <p>- sea level approx 1.7m above normal high tide at the Waikanae Mouth.</p>	MCBprt69
29Jul76	Mouth opened 29th July & 3rd August. Unsuccessful on 29Jul. Description on file and recommendations for future mouth openings. Photocopies of photos of the 3Aug work on file 10/4v5, 10Aug76.	10/4
19Aug76	Photograph of mouth taken after heavy seas (which caused erosion at Raumati). Mouth moved 20m south.	10/4v5
18Nov76	Investigation to establish "tamarisk" and "elders" to protect the gravel banks at Otaihanga.	10/4v5
14Apr80	Request to WLC to maintain Waimea Lagoon outlet culverts. Statutory managers advise no funds available.	10/4v7
19Jan84	Kapiti Borough Council. Mouth has moved as far south as it is normally permitted.	10/4
1984	Mouth cut. \$4000-\$5000.	10/4v8
1986	<p><u>Factors Affecting River Mouth Stage</u></p> <p>Flood levels at and downstream of Greenaways Road are significantly affected by the sea stage and river mouth position. Unacceptable flood levels can occur at Greenaways Road for flows less than the design discharge.</p> <p>A rise in sea level of .88m above M.H.W.N. is enough to impede floodwaters and raise levels at Greenaways Road.</p> <p>An increase in level of .55m due to MHWST, wave run-up and set-up can be expected.</p> <p>Barometric pressure variations will lead to a change in predicted tide level of 10mm for every 1mb pressure variation. Tide tables calculated for 1014mb. Design storm assumed to be 980mb.</p> <p>A change in bed gradient occurs at Greenaways Road from 1:230 upstream to 1:380 downstream with a northerly mouth position. The predominant NW winds cause a southerly littoral drift of sand, a process which can move the mouth opening up to 800m south of the direct line to the sea before it is artificially redirected into its northern course. The southerly drift results in a flatter gradient in the outlet reach, water quality problems in times of low flow, and in drainage problems within the northern Paraparaumu Beach subdivisions.</p>	MCBprt69
8Mar89	Kapiti Borough Council request mouth opening. Adverse effects; loss of water quality, difficulty with boats, effect on stormwater outfalls.	10/4v8
Apr89	Mouth cut.	10/4v8

2.16. ARCHIVE 16: WAIKANAĒ LAND COMPANY DEVELOPMENT

Date	Summary of file entry.	File/Plan
1898	The land titles at the estuary were fixed by the centreline of the river as surveyed in 1898 (also until recently the southern Horowhenua County boundary). As there has been considerable accretion and river movement since 1898 a large proportion of the estuary was in private ownership in 1970.	12/2 4Mar74
20May69	Tentative proposals to develop the Waimea stream outlet and surrounding land as a marina centred subdivision put to MCB for comment by Clark & Davy Ltd, Palmerston North developers (Waikanae Land Company). No objection to the tentative scheme but will give due consideration to proposals when a final scheme is submitted.	10/4v3 Sketch on file.
15Aug69	Waikanae Land Company successful in tendering for an adjacent 20 acre block. In a position to proceed with subdivision and marina design.	10/4v3
21Aug69	Meeting with WLC and HCC engineers to discuss development. MCB Board Member, Engineering and Admin staff attended. River reserves will be required on Waikanae River, but to be included in marina reserves on the Waimea outlet.	10/4v3
15Sep70	<u>Terris</u> . Property owner and developer to the south of WLC. River mouth currently on his land. Would object strongly to its diversion north of his boundary by WLC. Intends to link the mouth with a small inland lake on his subdivision. <u>MCB</u> no action will be taken without prior consultation with all parties.	10/4v3
20Oct70	<u>WLC</u> to investigate all possibilities for access to the sea and sought to consult with <u>MCB</u> engineering staff. <u>MCB</u> to inspect mouth. Welcomed submissions from the WLC as to their ideas and requirements. 21Oct70 MCB advise that the MCB had no firm policy on the Waikanae River mouth other than the terms of the MCB Waikanae River Control Scheme. Any proposals will receive consideration when submitted.	10/4v4
1970	Sketch plan of proposed subdivision and marina.	Plan1703
28Oct70	<u>HCC County Engineer</u> acting in an advisory capacity to the Waikanae Land Company (WLC) (with HCC authority) discussed the proposed marina development with the MCB. Concept included a northern mouth opening maintained with a 3' minimum draught. MCB advised that the max design river flow was 24,000 cusecs. The MCB had no definite policy for stabilising the mouth although any scheme acceptable to the Board, technically and politically would receive consideration. and referred the proposal to <u>NWASCO</u> for comment. (The proposed MCB design discharge for the Waikanae Scheme was 24,000 cusecs, with a 2' freeboard. During technical approval <u>NWASCO</u> required this be increased to 30,000 cusecs, with a 1' freeboard. The earlier figure is used exclusively after c.1960, possibly a mistake by the MCB Chief Engineer <u>Leenards</u> , as a result of reference to the 1955 Scheme Report.)	10/4v4
2Feb71	<u>NWASCO</u> . The aim of the works appears to be highly desirable and technically sound. Suggested that a local benefit rating area be formed. <u>MCB</u> advised WLC that the Marina is approved in principle.	10/4v4
25Feb71	<u>WLC</u> application to divert the Waikanae River to undertake exploratory works for the development of a navigable marina entrance. Application no. 117. Objections received from; MCB (to reserve the right to stop or divert any works which could have a detrimental effect on the Waikanae Scheme), <u>Wgton Acclimatisation Society</u> (objection withdrawn on the understanding that no permanent works would proceed without public consultation), <u>C.F.Terris</u> , developer to the south (objection withdrawn after entering into a formal agreement with the WLC regarding the availability of tidal flows for a proposed southern marina) Application to be granted subject to WLC concluding the formal agreement with <u>Terris</u> . Water right 710072 granted 16Nov71.	53/0v1
30Mar71	<u>MCB</u> to WLC. While MCB may approve in principle the marina development it makes no guarantee to keep a minimum depth in the mouth opening. Company should propose how it is to finance the development and fund future maintenance. could be by way of a local benefit area , or by inclusion in the present district but at a higher	53/0v1

2.16. ARCHIVE 16: WAIKANAE LAND COMPANY DEVELOPMENT

Date	Summary of file entry.	File/Plan
	rate.	
25Aug71	<p><u>Marine Department.</u> To MCB. Works at mouth without authority.</p> <p>File Note: Chief Engineers understanding;</p> <ul style="list-style-type: none"> - MCB has a delegated authority (from the Marine Dept.) to open the mouth. - MCB advises the Dept. so that a navigation warning can be issued. - Authority required for works on tidal land subject to sections 176 to 182 of the Harbours Act 1950 (in part. sect 178). <p><u>MCB</u> advised Marine Dept. that it did not give authority for the work.</p>	53/0v1
17Jul72	<p><u>WLC</u> Proposal for permanent works.</p> <p>Experience of the last year has shown that the temporary works (anchored tree work on both banks near high tide) was generally on the right lines. Propose to replace this with permanent rip-rap to be placed to the bottom of deep water. The company's dredge to deepen the channel to 6' below low water level. The bank to be 2' above extreme high tide to prevent waves washing over it and removing the far side.</p> <p>The bank to be constructed from sand from the dredging augmented by sand pushed up by bulldozer where necessary. Bank to be covered with broken rock containing a reasonable percentage of fines, finished off with larger rock of 1' to 1.5' along the bulk of the length. For two chains near the sea rock size 3' to 4' with a strong point with rock all round the end. Rock work designed for 6' waves using Islbash formula. Shape designed to fit in with the Waikanae Scheme meander length of 19-23ch, radius 8ch. It does not extend far enough seaward to interfere with the littoral sand drift and could be extended a further 2ch before having such an effect.</p> <p>Work will be of mutual benefit to WLC, to the district and the Waikanae River in particular. Request that an application be made for Soilcon subsidy on the estimate of \$14,755 with the unsubsidised portion equitably shared between the WLC and the MCB. Not anticipated that there will be much maintenance but the increased capital value of the WLC developments should bring in sufficient rates. The classification of the area could be considered at the time.</p> <p>Temporary work nearing the end of its useful life and permanent works should be carried out before there is any appreciable alteration to the present location of the river.</p>	54/4
Sep72	<p><u>MCB Report on the River Mouth (D.M.Brown, A.G. Leenards)</u></p> <ul style="list-style-type: none"> - Follow-up works proposed by WLC considered sensible but could not be guaranteed. - Restriction of mouth regarded with concern as was the proposed development around the estuary. - Proposed work would not have a detrimental effect on the Waikanae Scheme although it may be washed away. - To obtain a complete safeguard that the works would not fail would require extensive investigations not warranted at the present time. - There was a danger of temporary success and then who pays when the works fail. - The temporary works were in a deplorable condition. They should be cleaned up before Christmas. MCB lost heavily in public goodwill. - Maintenance costs were likely to be high. - Purpose of the works was to sell 240 sections to the north. WLC would cease to exist after the sale of the last section. <p><u>Recommended</u></p> <ul style="list-style-type: none"> - WLC proceed with permanent works as proposed. - All temporary works be removed. - Could permit no danger to the public. - MCB accept no responsibility for maintenance without a formal financial arrangement. - MCB advise HCC to stop any further subdivision or construction until mouth stability has been satisfied. 	54/4 Plan1830

2.16. ARCHIVE 16: WAIKANAE LAND COMPANY DEVELOPMENT

Date	Summary of file entry.	File/Plan
19Sep72	<p><u>MCB response to WLC letter and MCB reports.</u> The MCB circulated the confidential MCB reports to HCC and WLC. Informed HCC that they did not consider the area suitable for subdivision and that restrictions should be placed under the Town and Country Planning Act.</p> <p>MCB advised WLC that they would not be prepared to apply for a subsidy on the grounds that the expenditure was not justified for the purpose of maintaining the position of the Waikanae River mouth but if an application is made the MCB would subscribe the equivalent annual amount as paid in the past to maintain the mouth opening. If WLC was to proceed with a stabilisation scheme the full cost and maintenance would be the permanent responsibility of the Company and successors in title. MCB provide no guarantee that it would provide permanent stability or protection to the area. Full details of the proposed scheme would be supplied to NWASCO.</p> <p>The advice supplied by the MCB in its role as River Authority. It had no bearing on the WLC application for a water right to divert, to be considered by the MCB in its role as a Regional Water Board.</p>	10/4/1
5-6Feb73	<p><u>Tribunal set up to hear objections to the WLC's proposal.</u> The Tribunal recommendation was that the application be granted subject to:</p> <ul style="list-style-type: none"> - Full engineering plans and specs to be supplied to the MCB. - Work to meet technical and aesthetic standards required by the MCB. - The seaward end of the "mole" to be accurately determined and agreed upon with the MCB. - The works to be supervised by the MCB. - The full cost to be borne by the Company. - The company to maintain the works for a specific period (to be agreed by the MCB) after which the MCB take over full maintenance responsibility. The maintenance responsibility likely to be influenced by a likely review of rating for the whole area. 	53/0v1-3
1973	<p>With the formation of the Wellington Regional Water Board on 1Dec72 the MCB boundary was changed to exclude the Waikanae River catchment, effective 1Mar73. By letter 24Jan73 the WRWB authorised the MCB to act as its agent at the special Tribunal. The MCB received and recommended to the WRWB the recommendations of the Tribunal. On the 16May73 the applicant and objectors were advised that the matter lay with the WRWB. The recommendations remained confidential.</p>	54/4
11Jun73	<p>Following discussion with the MCB and HCC the WRWB approved the application, with the tribunal recommendations adopted and strengthened with additional clauses;</p> <ul style="list-style-type: none"> - Works to be prepared and supervised by a registered engineer. - An additional reserve be provided to the south side of the river. - Maintenance to be the responsibility of the WLC for as long as it remains in existence and in any case for a period not less than 10 years. To be supported by a bond stipulated by the Board. - During the 10year maintenance period the WRWB may require the company to deposit in a trust account a sum considered sufficient to ensure continuing maintenance of the Works, with the WRWB having access to the capital and income from the trust. - The company acknowledge that no guarantee is given for the continued navigability of the channel and that this be particularly drawn to the attention of prospective purchasers. - That the WLC enter into an indemnity with the WRWB in respect of any claims which may be brought against the WRWB in respect of any of the works of the WLC. 	12/2
18Jul73	<p><u>WLC</u> submits plans for technical approval. These were returned requiring they be brought to a higher standard of specification. Over the following year the WLC submitted further details but failed to produce a detailed set of construction drawings. The WRWB sought the advice of Seaton Sladden & Pavitt, Consulting Engineers, NWASCO and the Marine Department (MOT) leading to a conditional technical approval, 9Jul74. Marine Department approval followed 25Sep74.</p>	12/2
14Aug73	<p><u>Appeal</u> against the WRWB decision by D.R.Ranger on the grounds of environmental</p>	

2.16. ARCHIVE 16: WAIKANAE LAND COMPANY DEVELOPMENT

Date	Summary of file entry.	File/Plan
	damage. Appeal hearing held 4Oct73 during which MWD engineers suggested alternative options of a more southerly mouth position (refer "Alternative Management Scheme for the Waikanae River Estuary" H R Thorpe NWASCO 3Oct73, and letter 8May74, Thorpe, 12/2). The appeal was dismissed but the additional requirement was made to maintain the estuary south of the diversion as a tidal area.	
14Sep73	Minister of Works made a requirement pursuant to sec21(7) Town and Country Planning Act 1953, that an area of approximately 50 ha at the estuary of the Waikanae River be designated in the relevant district planning schemes as "Proposed Recreational and Wildlife Reserve".	12/2
24May74	Water Right 740032 to divert Waikanae River issued in favour of WLC.	12/2
22Jul74	WLC accepts conditions of water right but wanted to discuss the 1ch southern reserve and maintenance of the works as a public work.	12/2
20Aug74	WLC application for subsidy. 2:1 on \$48,000 expenditure in the 1974/75 year. \$12641 spent in the 1973/74 year. 5Feb75 subsidy declined.	12/2
6Jun75	<u>WLC</u> to WRWB. seeking meeting to discuss the future of the marina; - Is it viable. - What facilities would be required by the WRWB (sheds, clubhouse, moorings, access lock etc.. - How should the mouth be fixed. - How should the area south of the marina be used.	12/2
	As a result of the meeting the WLC propose to engage a landscape architect and asked for WRWB contribution. Contribution declined by WRWB.	
26Jul76	Two further letters from WLC (consultant P G Evans) suggesting possible mouth positions. Second letter followed the flooding of 17-18Jul76. WRWB advise WLC of their intention to cut the mouth top arrest the southerly drift. WLC request a delay in order to fit in with their plans. The WRWB proceeded with the mouth opening without specific reference to the WLC plans.	12/2
7Sep76	<u>WRWB</u> to WLC(P G Evans); - Do not think that a permanent mouth is required. - Continuing with occasional cuts is the best option. - Up to the WLC to put forward proposals. - A subsidy is unlikely.	12/2
6Dec76	<u>WLC</u> intends to complete the undertaking along the lines recommended by the MWD during the water right appeal (refer 14Aug73 above). Altered plans on file.	12/2
26Oct77	<u>Marine Dept (MOT)</u> response to the WLC proposal; - Still only a sketch plan. - Work would have to be of a better standard than the works constructed to date. - Preferred to WLC original proposal.	12/2
14Apr80	<u>WLC in statutory receivership.</u> In a response to a WRWB request to maintain the Waimea Lagoon outlet channel the statutory managers (Wilkinson Wilberfoss) advise that the "Land and Building Systems Ltd. Group of Companies" of which WLC was part, had no funds.	10/4v7
1May80	<u>WRWB</u> suggested that the land forming the lagoon, boat harbour and river bed should be transferred to the County and the Board otherwise maintenance will become a charge on the land under the relevant sections of the Land Drainage and the Soil Conservation and Rivers Control Acts. Plan of reserve areas on file.	10/4v7
12May80	<u>HCC</u> suggest that the reserves be transferred to HCC to meet the outstanding contributions and costs (WLC share of stormwater works, fees etc. unpaid).	10/4v7
24Apr87	HCC still dealing with court cases arising from the WLC proposals. Contact person Pat Malloy, Chief Executive Officer, HCC.	10/4v8

2.17. ARCHIVE 17 : PLANNING & CONSENTS

Date	Summary of file entry.	File
1920	First subdivision of Paraparaumu. D.P.4828	
1923	First subdivision of Waikanae. D.P.6570	
1962	<u>MCB</u> response to flood damage caused in the 1962 floods. - Wrote to Counties in the area asking for subdivisional plans to be submitted for MCB scrutiny before the subdivisions took place. - Noted that MCB could give no guarantee that areas would be made flood free but would advise owners if their land was floodable or part of the old river bed.	10/4v1
Mar65	<u>Leybourne Avenue, lot 12 D P 25567.</u> Application to build referred by HCC. - Liable to flooding. - MCB would not agree to stopbanking. Owner reply 3Jul67: - Propose to build house on stilts. - Will give an under-taking not to require MCB to build works. MCB reply: - Had no authority to prevent building. - Did not advise building. - Would not build stopbanks. - Would take owners letter as an under-taking not to require works. <u>HCC</u> refused building permit on the basis of liability to flood.	10/4
9Aug65	<u>Elizabeth Street, lot 2 D P 22984.</u> Application to build referred by HCC. MCB, 13Sep65: - Land liable to flood from the river and from banking up from the storm-water drainage ditches. - Not suitable for building. - Could build a stopbank but would require a pumping station to discharge s/w.	10/4
4Jun70	<u>Waikanae Section no 148. "Godber", c.3mi40ch.</u> Relocation of stopbank to permit subdivision.	10/4v3
31Aug71	<u>11 Puriri Road, M.L.1491 C.F.135/31.</u> "Existing" MCB building restriction to remain.	10/4v4
14Sep71	<u>Christian Holiday Camp.</u> Septic tank soakage tests performed. No dye appeared in Waikanae River. MCB noted current HCC application for a loan for a community sewage scheme. The Holiday Camp to be connected in due course.	10/4v4
19Nov71	<u>HCC Proposed Scheme Change #5 MCB Submission.</u> - No objection to a 1ch coastal reserve. - Consideration should be given to increasing the reserve to a wider distance. - Sufficient land should be taken to cover any prospect of sea erosion.	10/4v4
30Mar72	<u>Waikanae Section 170c lot 5 D.P.17605.</u> Te Moana Road, "W.M.Sommerville", Waikanae Property Enterprises Ltd. - Formation of Fleetwood and Edgewater Streets.	10/4 plan1822
16May72	<u>Waikanae Section 194 Subdivision of Pt Ngarara West A21C.</u> Te Moana Enterprises Ltd. - Extension to Nimmo Ave West.	10/4 plan1823
26Jun72	<u>Valuation Roll no. 1494/403/1.</u> Adjacent to Nimmo Ave. - Subject to flooding, unsuitable for house construction.	10/4
25Jul72	<u>Paraparaumu North Subdivisions.</u> - Hutt County Council consider subdivision has reached the extent of usable land. MCB asked to comment.	10/4
26Sept72	<u>Waikanae River Mouth (Waikanae Land Company subdivisions).</u> MCB again emphasize 1ch reserve is not considered adequate in this circumstance.	10/4/1

2.17. ARCHIVE 17 : PLANNING & CONSENTS

Date	Summary of file entry.	File
	<p>29Sep72 HCC to MCB:</p> <ul style="list-style-type: none"> - What is the width and location recommended for both the river and the sea boundaries? - Does MCB have the money to pay compensation. - HCC currently requires 1ch from the line of the marram grass. <p>17Nov72 MCB to HCC:</p> <ul style="list-style-type: none"> - MCB consider 1ch not enough to protect property from either sea or river erosion. - MCB provides advice as required to HCC. - The County Act requires subdividers to deposit <u>not less than</u> 1ch. - MCB has no funds as subdivision is not its area of activity. 	
24Nov72	<u>Greenaways Road</u> . HCC lease river reserve land to graze dairy cows.	10/4
8Mar73	<u>Paretai Grove, Part lot 29 D.P.28643, Mr Fahey</u> . - Land floodable, not suitable for building or subdivision.	10/4
	20Feb73: HCC refuses to approve subdivision on the grounds of floodable.	
	9Apr73: HCC refers building application received 23Mar73, seeking confirmation that MCB would recommend refusal.	
	2May73: MCB confirms that no works are proposed to protect the property from flooding.	
Sep/Oct73	<u>Hadfield, end of Greenaway Road</u> . (part of Kapiti Borough) Landfill operated by HCC at the end of Greenaways Road was overfilled onto Hadfields property. As compensation HCC swapped a parcel of land which gave Hadfield legal access to the north side of the river onto Greenaways Road. Plans on file. Refer entry 4Aug55, Archive Table *, for details of landfill.	10/4v3
24May76	<u>Greenaways Road Extension Subdivision</u> . River Properties Ltd (later Mr Lynds and later Mr Larkin).	10/4/4
	Tse Group Ltd. seeking flood information for the development of the right bank, 2mi20ch, for a proposed conference centre.	
	23Nov76 WRWB to Tse Group:	
	<ul style="list-style-type: none"> - 50yr flood covers ground to approx 1.5m. - 100yr flood covers ground to approx 1.9m. - Stopbank required 1.5 to 3m high to protect against 100yr flood plus 0.5m freeboard. - No objection to the development proceeding subject to approval of the stopbank. - The stopbank would have to extend east to high ground beyond the development property. 	
	13Dec76: At KBC request WRWB lodged an objection to the proposal to ensure that the requirements were made a condition of approval. The proposal was eventually abandoned and the site sold to Mr Lynds (see entry 9Nov81 below).	
18Aug76	<u>Waikanae Section 285, Greenaways Road</u> . Chillingworth, lot 2 D.P.32036. Approval to subdivide granted on condition that any dwelling to be erected on lot 1 is to be on the high northern portion unless WRWB approval is obtained.	10/4v5
	24Aug76: Plan of position of the proposed house site.	
	8Sep76: Comments re flood levels, floor level 7.0m(msl), and the proposed new stopbank to protect the proposed conference centre on the downstream property.	
	4Nov76 WRWB:	
	<ul style="list-style-type: none"> - House site approved as it is above the 50yr flood level prediction. - Allowance must be made for erosion along the river boundary. - Plan on file identifies the area of lot 1 above the 50yr flood level. 	
24Nov76	<u>Lot 32 D.P.28643, Mr Pike</u> . Advice to HCC regarding conditions for the subdivision of the floodable river berm, requiring the blocking off of old flood channels and the building up of some areas. A 50m allowance for river erosion was recommended. Plan and cross sections on file.	10/4v5

2.17. ARCHIVE 17 : PLANNING & CONSENTS

Date	Summary of file entry.	File
9Nov78	<u>Greenaways Road Extension</u> . Mr Lynds. Proposal to build a house and to undertake berry fruit production on the site of the proposed conference centre. WRWB have no objection provided the house elevation and situation with respect to the river are adequate. 4Jan79: Site visit by WRWB and follow-up letter implying that the house level was satisfactory. 16Jan79: Letter from WRWB giving flood level in terms of a reduced level. The property was built with the floor level in terms of local ground level, significantly below the recommended flood level and has subsequently been flooded.	10/4v7
25Feb80	<u>Kapiti Coast Developments Ltd</u> . Cuttriss, Mckenzie, Martin & Co plans 5742. Advise on proposed subdivision including flood levels, recommendations for filling, recommendations for location of stormwater outlet, etc..	10/4v7
5May83	<u>Elizabeth Street, west of WTP</u> . V.F.Devereux. Application to establish camping grounds on the right berm downstream of the Waikanae water supply treatment plant and river intake. Consent refused on the grounds of the sites proximity to the WTP.	49/12/KAPv2
13Dec84	<u>Greenaways Road Extension</u> . Lynds property sold to Larkin. Correspondence explaining previous advice supplied by the WRWB.	49/12/KAPv4
29Jul85	<u>Sheffield Properties, ex Lion/Safari Park</u> . Lots 3 & 4 D.P.44753. Invitation to MCB to purchase part of the subdivision adjoining the river for rivers purposes.	49/12/KAPv4
5Mar85	Approval for septic tank location on a rural property on the Ngatiawa branch of the Waikanae River.	49/12/KAPv4
4Apr85	Planning application by Gold Coast Removals Ltd. to store relocatable dwellings on the left river berm downstream SH1 bridge.	49/12/KAPv4
29May85	<u>Te Maku Farms Ltd</u> . Proposal to subdivide. Scheme plan SP405.	49/12/KAPv4
6Nov85	Design flood levels in the Waikanae River at the Reikorangi bridge.	49/12/KAPv4
3Dec85	<u>Lot 8 D.P.27528</u> Burnard residence at the "bluff", Reikorangi. Application to erect dwelling. Approval 26mar86.	49/12/KAPv4
20May86	<u>Otaihanga</u> . M.J.Greaves. Proposed subdivision scheme plan no SP413.	49/12/KAPv4
21May86	<u>Kebbles Bluff</u> . Howarth / Kebble / Napier. Seeking Zone change.	49/12/KAPv4
29Oct86	<u>Greenaways Road Extension</u> . Larkin. Application to subdivide. Consent refused by HCC Planning Tribunal hearing 28Apr87.	49/12/KAPv4 Plan2748
1986	<u>Kapiti-Waikanae Scheme</u> . Left Bank Zoning - residential E (rural/residential) mainly used for dairying in the past and after subdivision broken into 10-12acre allotments. Only limited suitable dwelling sites amongst the sandhills and small swamps. Scheme proponents call for a "Flood Channel Zone" for the Waikanae River channel, berm and stopbank areas with specific ordinances to prevent development within the zone.	MCBprt69
1986	<u>Foreshore Building Line Restrictions as at 1986</u> . - KBC District Scheme, 20m building line restriction and 30m relocatable zone applies south of Wharemauku Road, 20m building line restriction north of Wharemauku Road. - HCC District Scheme, 20m wide esplanade reserve, 50m reserve proposed. MCB recently obtained a "Grant Of Control" for the Waikanae River - the creation of a zone with recreational and catchment works as predominant uses.	MCBprt69
27Jun86	<u>Leybourne Ave</u> , Te Moana Road, Sawbourne Associates Ltd., Planning Application 428.	10/4v8
20Mar87	<u>Reikorangi Road</u> . Lot 7 D.P.27528, Wright. application for building permit.	49/12/KAPv4
16Sep87	<u>Devereux</u> . Lot 7 D.P.28171, Christian School adjacent to WTP. Application for	49/12/KAPv5

2.17. ARCHIVE 17 : PLANNING & CONSENTS

Date	Summary of file entry.	File
	planning consent. Approved 31Mar88.	
12Nov87	<u>Otaihanga Road</u> . R.W.Thomson, Scheme Plan 535. (also letter 18Jul88)	49/12/KAPv5
Dec87	<u>Floor Levels at Otaihanga</u> . 13 Otaihanga Road 3.7m (msl) 2 Makora Road 3.7m (msl) 22 Makora Road 4.0m (msl) flooded from s/w and Waikanae.	10/4v8
17Dec87	Drainage and floor plans for properties at Otaihanga.	49/12/KAPv5
14Jan88	<u>Larkin House</u> . Aerial photo showing extent of flooding and positions of proposed stopbanks.	10/4v8 plan2748
25Mar88	<u>Elizabeth Street</u> . "Menchi House", Part 1 D.P.22984. Floor level given with respect to approval given for the adjoining lot, "Ferretti House".	10/4v8 plan2635
23Feb89	<u>Greenaways Road Extension</u> . Willow Park Developments Ltd. Tucon Holdings Ltd. Following a meeting in Waikanae 17Feb89 where landowners were given the opportunity to discuss stopbanking proposals at Greenaways Road (proposed CDCB Waikanae-Kapiti Scheme) Tucon holdings observed that they were the only property owners interested in stopbanking and they were therefore interested in funding the Greenaways Road stopbank provided they had the right to subdivide. 22Mar89: MCB applied to MCB(water right) to alter the position of the Greenaways Road stopbank. Plan on file. 19Jun89: CDCB advise Willow Park Group that they could not permit the improvements to the Greenaways Road stopbank until banks were built at Otaihanga as the improvements could lead to increases in flood level at Otaihanga by 100mm. 14Jul89: Application from Willow Park Group to build on mounds. MCB still require a water right application to divert the river flows. Plan on file. Water Right application received 21Jul89.	10/4v8
24May89	<u>Weggery Estate</u> . Payne Sewell, requesting minimum ground levels required within the proposed subdivision at the Waikanae Mouth. 31May 89: MCB advised a minimum ground level of 3.0m (msl). 9Jun89: Payne Sewell requested a reconsideration of the minimum level to minimize the volume of earthworks required. 20Jun89: CDCB advised it could not alter the 3.0m level.	49/12/KAPv6
1Jun86	<u>Makora & Kahu Roads</u> . "100yr flood level" 4.15m (msl).	49/12/KAPv6
15Aug89	<u>Waione Development</u> . (Woodleigh Subdivision) south of Waikanae River off Mazengarb Road.(Originally proposed mid 1988 see file 10/4). - CDCB objection on grounds of flooding. 18Sep89: KBC correspondence noting that "some form of agreement (had been) reached with CDCB (and the proposer)". 19Sep89: Evidence of proposer's engineer, Hickling, Rankine & Hill. 24Oct89: CDCB notice of appeal against decision to allow subdivision. (KCB decision on file)	49/12/KAPv6
13Oct89	<u>4 Kahu Road</u> . Recommended floor level 4.1m (msl)	49/12/Kapv6

2.18. ARCHIVE 18 : SERVICES AND UTILITIES

Date	Summary of file entry.	File/Plan
9Apr59	Reikorangi Bridge waterway approval. - Replacement in 59/60 year. - 50yr flood level 112' (soffit 114.5'). - Based on 1954 flood, 25,000cusecs. Design flood 30,000cusecs = 50yr. - Eastern approach to be kept low to allow the passage of superdesign floods. Approval granted subject to the secondary flow path being kept open.	10/12/E
Apr66	Webbling Property, Kauri Road. Reference to floodgates.	10/4
30Jul68	Lots 46 & 47, Kauri Road. Details of flapgated culvert beneath stopbank. Plan on file (HCC 20/467).	10/4
1Jul71	SH1 bridge & NZR NIMT bridge. Plan on file detailing existing SH1 bridge and the positions of the previous wooden truss and bailey bridges.	10/4v4
17Nov75	Waikanae water supply weir. WRWB approval for the weir structure.	10/4v5
Mar78	New Zealand Post Office. Installation of ducts beneath the river. Includes 4 100mm ducts set in concrete and buried to a depth of approximately 2m. Crossing installed 21Mar78. Copy of WRWB approval on file 10/4, 1Aug84.	10/4
15May80	Ngatiawa bridge. Waterway approval. Plan on file.	10/4v7
6Oct80	Reikorangi private bridge, P.F.Cadle. Waterway approval.	10/4v7
23Dec80	Natural gas pipeline Waikanae loop. Details of river crossing.	10/4v7
12Aug83	Waikanae water supply intake. Proposed repairs to intake weir to close off the erosion holes beneath the weir sill. MCB approval followed by letter 9Sep83 advising that the downstream rock will have to be massive to prevent washout. Suggesting that the MCB work proposed to control the bed at the MCB recorder (31504 immediately upstream) will help align the flow towards the intake. Repair work estimated to cost \$23000 approved by the KBC 22Dec83 and put in hand 21Feb84.	10/4
4Apr84	Proposed footbridge to link reserve lands at the mouth. A joint KBC, HCC, NZ Army proposal. Preliminary plan on file 6Mar85.	10/4
1Aug84	New Zealand Post duct. Plan to pull a new cable through an existing duct. Duct approval 20Mar78. Details of new cabling 13Apr85.	10/4
21Oct87	Mangaone Bridge waterway approval. Proposed construction Feb88. Approval granted 17Nov87.	10/4v8
11Dec87	Telecom Duct. Request to protect the exposed duct. Includes works order for \$3000.	10/4v8
15Jul88	Greenaways Road Extension. Proposal to link a south bank subdivision with Greenaways Road. MCB requirements on file. Plan detailing spot heights on plan 25Aug88.	10/4v8

2.19. ARCHIVE 19 : BERM DEVELOPMENT

Table	Summary of file entry.	File/Plan
4Aug55	Application by HCC to establish a rubbish tip on land at the end of Greenaways Road. Lot 60 D.P.16850, Town of Waimeha recreational reserve (plans on file). MCB approval subject to: - Placement of rubbish to the direction of the MCB engineer. - Rubbish to be protected against river erosion by the construction of a small stopbank or by planting willows. - Should be possible to find an area in a backwater not effected by the flow of water.	10/12/E
	Jun65: Plan showing line of fill in 1961 & 1965. MCB request HCC not to extend further towards the river.	10/4v2
17Feb65	HCC plans to purchase property for a foot access along the Waikanae River. Application to use MCB tracks. MCB no objection but HCC must get permission of adjacent property owners.	10/4
27Nov66	Edgewater Park. Proposed planting and recreational development of the berms between SH1 and River Glade.	plan1497
14Oct68	Planting of poplars and macrocarpas on the river bank and the establishment of cuttings in a "nursery" - to provide plant materials for river works.	10/4v3
5Oct70	Recreational planting proposals. HCC (Waikanae Town Committee) suggested a joint program by the County and MCB. MCB approval in principle 8Oct70.	10/4
1972	Grassing and clearing of bermlands. General correspondence between HCC, MCB, and property owners with requests to improve the river environment.	10/4
1975	Swimming Hole. Edgewater Park. WRWB repeated the Hutt River practice of excavating swimming holes at the start of each summer. Natural holes were filled during bulldozing operations.	10/4v5
13Mar82	Vehicle control. The establishment of a security system to restrict vehicle access.	10/4v7
Feb83	Vehicle control. Petition from Nimmo Avenue residents to have the berm areas adjacent to their properties chained off to excluded all vehicle traffic.	10/4
15Aug83	Rabbit Control. HCC invitation to MCB to include river land. HCC arrangement with a rabbitier for a "shoot-out", Saturday evening, 10Sep83.	10/4
1986	Environmental assessment Kapiti-Waikanae Scheme. MCB considered that an environmental assessment of the proposed scheme upgrading would not be necessary as the impact would be no greater than the existing situation.	MCBrpt69

2.20. ARCHIVE 20 : ISOLATED WORKS OUTSIDE THE SCHEME AREA

Date	Summary of file entry.	File/Plan
3Nov66	Dalzeill, Reikorangi, 8ch. tree protection & shingle stopbank, £200.	10/2v1
12Jul67	Oakley, 20ch. medium protection works & planting, \$1000.	10/2v1
17Aug67	Thomas, bank protection, \$300.	10/2v1
17Aug67	Hadfield, bank protection, \$300.	10/2v1
22Apr70	Port, Te Maku, bulldozing & tree protection, \$900.	10/2v2
8Mar71	Port, Te Maku, 30-40ch bulldozing, 6ch tree protection, \$600	10/2v2
21Jun72	Port, Te Maku, bulldozing, \$300.	10/2v2
25Jul72	Dalzeill, 8ch bulldozing, \$150.	10/2v2
31Jul73	Port, Te Maku, bulldozing, \$450.	10/2v2
13Jun73	Plimmer, Upper Waikanae, tree protection, \$180.	10/2v2
3Nov74	Port, Te Maku, over 1mi bulldozing, \$600.	10/2v2
4Aug75	Dalzeill, d/s Reikorangi Rd. Br., channel improvements, \$600.	10/4v5
6Oct75	Port, Te Maku, Reikorangi Stream, bulldozing, \$400, result of logging activities, shingle slides, very high bed load and channel aggradation.	10/4/4
11may76	Port, Te Maku, bulldozing above road bridge.	10/5/1
13Sep76	Port, Te Maku, bulldozing, blocks, willow planting, \$800.	10/4v5
17Jul80	Port and Cleverly, bulldozing, subsidy dependent on bulk allocation.	10/4v7
12Jul82	Port and Cleverly, 250m bulldozing, \$330.	10/2v2
31May83	Monk Bros., 300m bulldozing & willow planting, \$1260.	10/2v2
22Sep83	Ngatiawa Stream works.	10/4
9Jan84	Port, Maunganui Stream, 2km bulldozing, \$1667.	10/2v2
23Nov84	Port, Reikorangi Stream, bulldozing, \$840.	10/2v2
13May85	Kapiti Borough Council / Oakley, bulldozing, \$2475.	10/2v2
Sep87	KBC / HCC / landowner, Reikorangi Bluff, bulldozing, \$3030.	10/4v8

2.21. ARCHIVE 21 : KAPITI - WAIKANAЕ SCHEME 1983-89.

Date	Summary of file entry.	File/Plan
1982	<p>Local Government Boundary changes requested by the Wellington Regional Council and supported by the Horowhenua and Kapiti Districts saw the reversion to the pre 1973 Catchment and Regional Water Board Boundaries.</p> <p>The 30Apr80 "final scheme area" for the WRC left the area outside the Region, being part of the Wellington Water Region, an out-district of the WRC for functions under the WRWB Act 1972. The out-district was to apply until alternative arrangements between the WRC and authorities in Kapiti and Horowhenua could agree on a preferred arrangement for water board functions. This was effective by Order in Council, 11Oct80 with the WRC assuming functions of the WRWB with effect from 1Dec80.</p> <p>In Apr80 the WRWB asked the Local Govt Commission to alter the WRWB boundaries to coincide with the WRC boundaries and to transfer the out district to the Manawatu Catchment District & Water Region (and functions under the Soil Con & Rivers Control Act 1941 & Water & Soil Conservation Act 1967.). Water supply was jointly assumed by the KBC & HCC. This came into effect on 1Apr82 by Order in Council 22Mar82.</p>	
29Apr82	<p><u>Scheme Funding.</u></p> <p>Prior to 1972 the Waikanae Scheme was funded by a special rate on a classified area. When the WRWB took over the area the Scheme was funded by a Regional rate as required by the WRWB Act 1972. This method of rating was continued by the WRC. The 1956 classification was apparently not maintained, probably because the classification sections of the 1941 Act did not apply to the WRWB, and because the maintenance of the classification was a substantial task.</p> <p>In 1972 the Waikanae Scheme was also due for Review. This was not carried out by the WRWB/WRC.</p> <p>Consequently, on the re-inclusion of the Scheme into the MCB District the MCB resolved to review the Scheme and to reclassify the area of benefit. In order to include an adequate rating base the concept of a Kapiti-Waikanae Catchment Control Scheme was promoted, including drainage and flood control works and covering the entire Kapiti Coast from Paekakariki to Te Horo. This was eventually reduced to the area of the 1955 classification, with neither the Scheme Review or the reclassification completed before the area reverted to the WRC in 1989.</p> <p>To provide funding during the review process (an interim period of "at least two years") the MCB requested grant assistance from NWASCO (in addition to its 1982/83 allocation). The local share was collected directly from the local authorities.</p>	10/4
4Mar83	<p><u>NWASCO allocation approval 1982-83.</u></p> <ul style="list-style-type: none"> - The programmed works for the Waikanae was altered to zero and the 82/83 works were funded as delegated works under the Board's bulk allocation. - River Control Works for the Waikanae would be retained on the Works programme. - An early submission of a scheme proposal was encouraged. 	10/4
23May83	<p><u>Funding 83/84, 84/85.</u> A start had been made on the Scheme review and reclassification. Funding for 83/84 & 84/85 would be as delegated works from the board's bulk allocation.</p>	10/4
1986	<p><u>PROPOSED SCHEME WORKS refer figures 10 page 77</u></p> <p><u>Stopbanking -</u> Upgrade stopbanks at Otaihanga and Purirui Road to contain a 100 year Hood.</p> <p><u>River Works:</u></p> <p>Improvements to the Water Treatment Plant</p> <ul style="list-style-type: none"> - placement of quarry rock - channel shaping - tree planting <p>Maintenance would be extended to the Akatarawa Road and 31km up the Reikorangi tributary.</p>	MCB rpt 69

2.21. ARCHIVE 21 : KAPITI - WAIKANAE SCHEME 1983-89.

Date	Summary of file entry.	File/Plan																																																																																																												
	<u>Flood Channel Zone</u> - the formal adoption of a flood channel zone																																																																																																													
	<u>Waimeha Stream</u> - continue maintenance																																																																																																													
	<u>Drainage Channels</u> The maintenance and improvement of - Hadfields Creek Drainage network (6.5km) - Black Drain network (1.0km) - Lion Park Drain (2.5km) - Wharemauku Stream (6km) - Whareroa Stream (Queen Elizabeth Park) (6.0km) - Smith's Creek (2.5km)																																																																																																													
	<u>Works Program and Summary of Costs</u>																																																																																																													
	<table border="1"> <thead> <tr> <th></th> <th><u>Estimate</u></th> <th><u>Subsidy</u></th> <th><u>Subsidy</u></th> <th></th> <th></th> </tr> <tr> <th></th> <th></th> <th><u>Rate</u></th> <th></th> <th></th> <th></th> </tr> </thead> <tbody> <tr> <td>1987/88</td> <td>Scheme Improvements</td> <td>50,000</td> <td>60%</td> <td>30,000</td> <td></td> </tr> <tr> <td></td> <td>Construction Maintenance</td> <td>12,500</td> <td>60%</td> <td>7,500</td> <td>7,500</td> </tr> <tr> <td></td> <td>Maintenance</td> <td>37,500</td> <td>25%</td> <td>9,375</td> <td></td> </tr> <tr> <td>1988/89</td> <td>Scheme Improvements</td> <td>112,500</td> <td>60%</td> <td>67,500</td> <td></td> </tr> <tr> <td></td> <td>Construction Maintenance</td> <td>12,500</td> <td>60%</td> <td>7,500</td> <td>7,500</td> </tr> <tr> <td></td> <td>Maintenance</td> <td>37,500</td> <td>25%</td> <td>9,375</td> <td></td> </tr> <tr> <td>1989/90</td> <td>Scheme Improvements</td> <td>112,500</td> <td>60%</td> <td>67,500</td> <td></td> </tr> <tr> <td></td> <td>Construction Maintenance</td> <td>12,500</td> <td>60%</td> <td>7,500</td> <td>7,500</td> </tr> <tr> <td></td> <td>Maintenance</td> <td>37,500</td> <td>25%</td> <td>9,375</td> <td></td> </tr> <tr> <td>1990/91</td> <td>Scheme Improvements</td> <td>112,500</td> <td>60%</td> <td>67,500</td> <td></td> </tr> <tr> <td></td> <td>Construction Maintenance</td> <td>12,500</td> <td>60%</td> <td>7,500</td> <td>7,500</td> </tr> <tr> <td></td> <td>Maintenance</td> <td>37,500</td> <td>25%</td> <td>9,375</td> <td></td> </tr> <tr> <td>1991/92</td> <td>Scheme Improvements</td> <td>50,000</td> <td>60%</td> <td>30,000</td> <td></td> </tr> <tr> <td></td> <td>Construction Maintenance</td> <td>12,500</td> <td>60%</td> <td>7,500</td> <td>7,500</td> </tr> <tr> <td></td> <td>Maintenance</td> <td>37,500</td> <td>25%</td> <td>9,375</td> <td></td> </tr> <tr> <td></td> <td></td> <td><u>\$687,500</u></td> <td></td> <td><u>\$346,875</u></td> <td></td> </tr> </tbody> </table>		<u>Estimate</u>	<u>Subsidy</u>	<u>Subsidy</u>					<u>Rate</u>				1987/88	Scheme Improvements	50,000	60%	30,000			Construction Maintenance	12,500	60%	7,500	7,500		Maintenance	37,500	25%	9,375		1988/89	Scheme Improvements	112,500	60%	67,500			Construction Maintenance	12,500	60%	7,500	7,500		Maintenance	37,500	25%	9,375		1989/90	Scheme Improvements	112,500	60%	67,500			Construction Maintenance	12,500	60%	7,500	7,500		Maintenance	37,500	25%	9,375		1990/91	Scheme Improvements	112,500	60%	67,500			Construction Maintenance	12,500	60%	7,500	7,500		Maintenance	37,500	25%	9,375		1991/92	Scheme Improvements	50,000	60%	30,000			Construction Maintenance	12,500	60%	7,500	7,500		Maintenance	37,500	25%	9,375				<u>\$687,500</u>		<u>\$346,875</u>		
	<u>Estimate</u>	<u>Subsidy</u>	<u>Subsidy</u>																																																																																																											
		<u>Rate</u>																																																																																																												
1987/88	Scheme Improvements	50,000	60%	30,000																																																																																																										
	Construction Maintenance	12,500	60%	7,500	7,500																																																																																																									
	Maintenance	37,500	25%	9,375																																																																																																										
1988/89	Scheme Improvements	112,500	60%	67,500																																																																																																										
	Construction Maintenance	12,500	60%	7,500	7,500																																																																																																									
	Maintenance	37,500	25%	9,375																																																																																																										
1989/90	Scheme Improvements	112,500	60%	67,500																																																																																																										
	Construction Maintenance	12,500	60%	7,500	7,500																																																																																																									
	Maintenance	37,500	25%	9,375																																																																																																										
1990/91	Scheme Improvements	112,500	60%	67,500																																																																																																										
	Construction Maintenance	12,500	60%	7,500	7,500																																																																																																									
	Maintenance	37,500	25%	9,375																																																																																																										
1991/92	Scheme Improvements	50,000	60%	30,000																																																																																																										
	Construction Maintenance	12,500	60%	7,500	7,500																																																																																																									
	Maintenance	37,500	25%	9,375																																																																																																										
		<u>\$687,500</u>		<u>\$346,875</u>																																																																																																										
	Average subsidy rate 50%																																																																																																													
26Jun86	Kapiti - Waikanae Scheme presented to MCB and to NWASCO for comment.	10/4v8																																																																																																												
23Jul86	Request from HCC for the inclusion of the following in the reviewed scheme: - The 3 drains flowing to the river south of Elizabeth Street. - The Waimeha Stream to Te Moana Road, the boundary of the existing residential development. MCB reply 23Dec86: - Waimeha Stream to the residential area (Golf Course) would be included. - The other rural drains previously intended to be part of the Scheme were to form the Peka Peka Drainage Scheme (Ngarara Stream (Black Drain) to SH1, Mile Drain, South Drain, Diagonal Drain, Hadfield's Creek).	10/7																																																																																																												
23Sep86	<u>Grant Levels.</u> - River improvements 50% (40% grant + 10% premium) - Construction maintenance 50% (40% grant + 10% premium) - River maintenance 25%	10/4v8																																																																																																												

2.21. ARCHIVE 21 : KAPITI - WAIKANAЕ SCHEME 1983-89.

Date	Summary of file entry.	File/Plan
	- Drain maintenance 25%	
Oct86	Details of land held by the MCB on the Waikanae including copies of Gazette notices on file.	10/4v8
14Oct87	<u>New traverse.</u> Otaihanga to SH1.	Plan2811
15Sep87	<p><u>Scheme Promotion.</u> recommendations from the C.E. to the MCB: Investigations completed for a 100year flood design and a meeting had been held with KBC which had received a favourable response.</p> <p>- Approve proposed stopbank works for Otaihanga (KBC estimate \$72,000) and for Kauri Road and Puriri Road (HCC, WDCC estimate 16,000). Total incl engineering fee \$110,000 + G.S.T. - Consider financing during the 1988/89 estimates. - Discussions to be held with representatives of HCC & WDCC. - Programme over the next two years with the local share being paid by the two local authorities (or to classify the entire area for benefit to derive the local share of finance). A subsidy rate of 35% was considered appropriate although this could not be confirmed until the MCB bulk allocation for 88/89 was confirmed.</p> <p>A meeting was arranged with HCC & WDCC for 20Oct87 but was not held.</p>	10/4v8
17Dec87	<p><u>Scheme Estimates.</u> based on recent work KBC and HCC independently considered MCB Scheme Estimates were too low (by approx 100%).</p> <p>KBC referred the matter to Otaihanga Progressive Association and recommended a public meeting should be held to explain the effects of the proposals on the residents properties.</p>	10/4v8
22Jan87	MCB revised estimate for Kauri/Puriri upwards to \$32,000 + eng fees, and Otaihanga to \$118,000 + eng fees.	10/4v8
17Mar88	Meeting with HCC to explain proposals. Concern over the slow progress of the reclassification.	10/4v8
22Mar88	<p><u>KBC.</u> No sum had been allowed in the estimates for the coming year for stopbank construction. KCB believe that a more detailed analysis of options and benefits will be required before progress can be made.</p> <p>The questions raised by KBC were addressed by the MCB in a letter of reply 1Jul88. The reply provided a plan showing the probable extent of inundation but did not contain a consideration of options or relative benefits.</p>	10/4v8
12Apr88	HCC offer of assistance with the reclassification.	10/4v8
19Apr88	HCC approval in principle for the \$40,000 stopbanking proposal.	10/4v8
17May88	Water Rights 880057 and 880056 for the diversion of the Waikanae River by way of earth stopbanks granted for Otaihanga and Te Moana Road areas respectively. Rights expire 30Sep95.	10/4v8
19Jul88	MCB to HCC. MCB bulk allocation had been cut by \$278,000 and no money would be available for the Waikanae Works. MCB encouraged the HCC not to delay with construction.	10/4v8
5Dec88	<p><u>Report from Classifiers.</u> Notes from the classifiers regarding progress made towards the reclassification.</p> <p>- Reclassification commenced with receipt of the May86 Scheme Report. - Following discussion with MOWD the Kapiti portion was dropped (7 drainage channels) - Following removal of Govt subsidies Jun87 the drainage schemes were separated from the river scheme. - Waimeha stream & Lagoon drain were essentially part of the urban stormwater system and should be managed and funded by the LTA. - Waikanae River works benefit was limited to a small group of ratepayers adjacent to the river and west of Te Moana Road.</p>	Waikanae Classificatio n V1

2.21. ARCHIVE 21 : KAPITI - WAIKANAЕ SCHEME 1983-89.

Date	Summary of file entry.	File/Plan
	- Drainage channels from Elizabeth street omitted and the scheme terminated at the Water Supply intake.	
23Feb89	<p><u>Greenaways Road Extension</u>, Willow Park Developments Ltd. Tucon Holdings Ltd. Following a meeting in Waikanae 17Feb89 where landowners were given the opportunity to discuss stopbanking proposals at Greenaways Road (proposed CDCB Waikanae-Kapiti Scheme) Tucon holdings observed that they were the only property owners interested in stopbanking and they were therefore interested in funding the Greenaways Road stopbank provided they had the right to subdivide.</p>	10/4v8
	22Mar89: MCB applied to MCB(water right) to alter the position of the Greenaways Road stopbank. Plan on file.	
	19Jun89: CDCB advise Willow Park Group that they could not permit the improvements to the Greenaways Road stopbank until banks were built at Otaihanga as the improvements could lead to increases in flood level at Otaihanga by 100mm.	
	14Jul89: Application from Willow Park Group to build on mounds. MCB still require a water right application to divert the river flows. Plan on file. Water Right application received 21Jul89.	
19Apr89	Letter from Otaihanga Progressive Association stating that the Otaihanga residents do not want stopbanks.	10/4v8
3May89	Meeting at Otaihanga. Attended by residents invited by the Progressive Association and representatives from MCB, WRC, KBC & WDCC (including a number of councilors.	10/4v8
	- The motion "That this meeting oppose the proposal on environmental & financial grounds" was put to the residents present and was passed; approx 20 did not want stopbanks, 6 did, and approx 6 abstained.	
	In the minutes of the meeting it was suggested that the invited residents may not have been representative of the total Otaihanga population.	
6Jun89	Expression of concern from KBC that the question of stopbanking at Otaihanga should not be decided on a majority vote. Concerned about the liability for flooding should the scheme not go ahead.	10/4v9
5Jul89	Reply to KBC. MCB would be reluctant to proceed with a scheme if a clear majority of ratepayers clearly indicated that they were opposed to the costs to be imposed on them. However the Borough could fund the works from its own rates if it felt it had a "duty of care" to protect the owners of dwellings at risk from flooding.	10/4v8

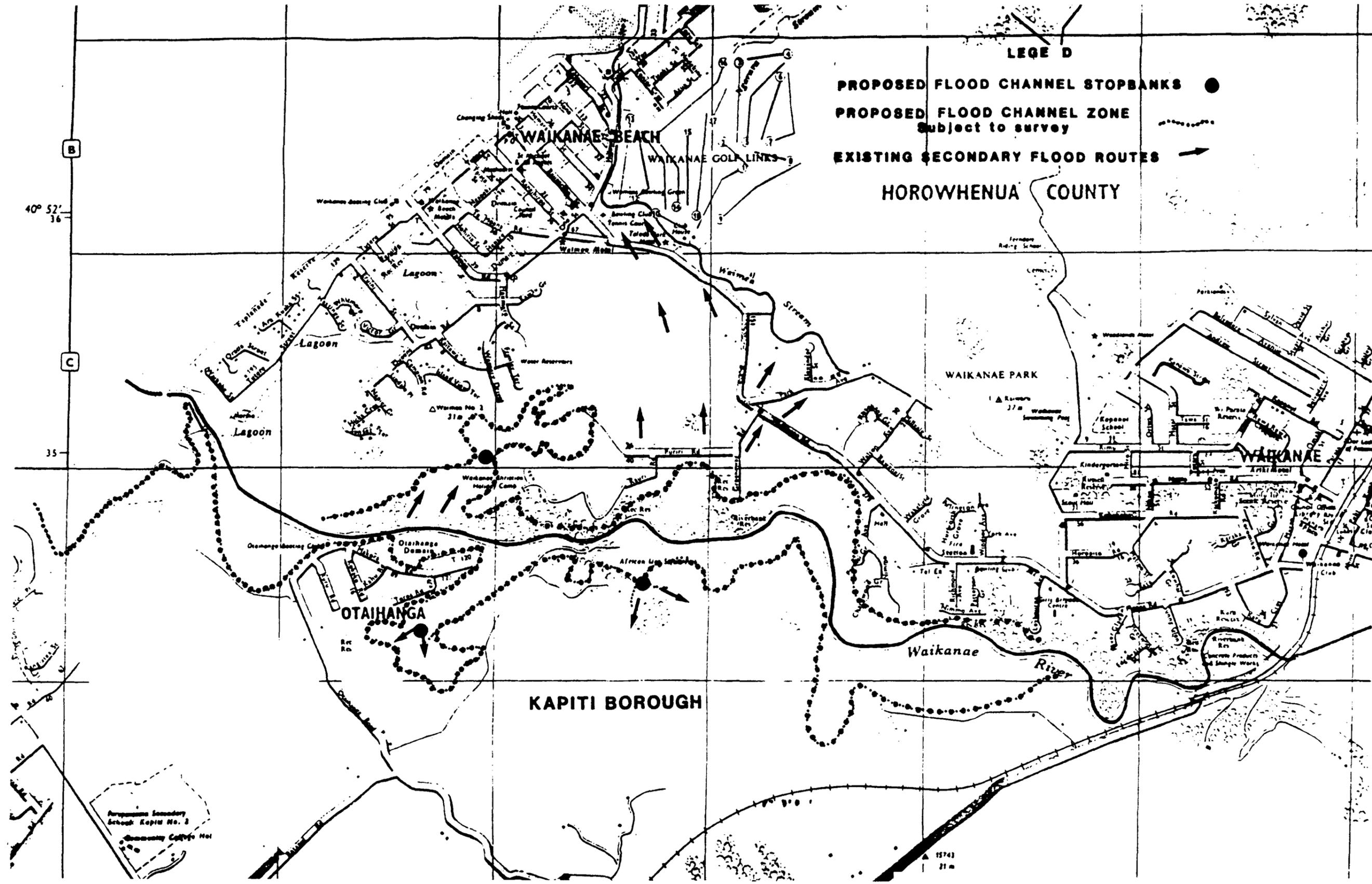


Figure 10. Kapiti - Waikanae Proposed Scheme