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**Tanners Point Stormwater
 Catchment Management Plan**

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EXECUTIVE SUMMARY

The Western Bay of Plenty District Council (WBOPDC) has identified the need for stormwater catchment management in some of the smaller settlements of the Western Bay of Plenty. This document provides an overview of the Tanners Point stormwater catchment, describing the catchment's characteristics and stormwater network. This is the third revision of the document; the changes include revised capital works and maintenance costs and the addition of a public consultation section.

Tanners Point is a small settlement north of Katikati with a catchment area of approximately 30 Ha. The catchment is roughly triangular in shape bordering the Tauranga Harbour on two sides and rural land on the third. The Tanners Point area is zoned residential.

The existing stormwater network was modeled using the MOUSE drainage software and an ecological assessment of the catchment was prepared by Wildland Consultants.

Network upgrades were recommended as a result of the network modeling. The recommendations are based on maximum probable development using the current Western Bay of Plenty District Council Code of Practice (2001) and District Plan constraints. Should any of the current rules or controls change, stormwater discharge constraints may be required for further development.

The estimated cost of the recommended upgrade works totaled \$749,820 excl GST. This work is proposed to start in the 2006/2007 financial year and would take 12 years based on the assumed funding allocation. The maintenance cost for any additional constructed assets is negligible with an additional maintenance cost per annum of approximately \$870 expected from 2007/2008 upon completion of capital works that include new pipes.

The report produced by Wildland Consultants outlines recommendations for future management to protect the stormwater receiving environment. Recommendations include planting, management of the gully and bank stabilisation. The total cost of the recommended work is estimated at \$27,500 excl GST, with work proposed to start in the 2006/2007 financial year.

The capital works programme was included in the 2006 LTCCP round and submissions on the Tanners Point programme were received. This report includes modifications as a result of this process.

**Western Bay of Plenty District Council
Tanners Point Stormwater
Catchment Management Plan**

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1.0 INTRODUCTION

The Western Bay of Plenty District Council (WBOPDC) has identified the need for stormwater catchment management in some of the smaller settlements of the Western Bay of Plenty. This document provides an overview of the Tanners Point stormwater catchment, briefly describing the catchment characteristics and stormwater network.

The existing stormwater network was modeled using the MOUSE drainage software, which allowed the network and recommended upgrades to be assessed for effectiveness.

This catchment management plan also incorporates the results of an ecological assessment of the catchment prepared by Wildland Consultants in November 2003.

This report is the third revision, changes made include an update of the capital works and maintenance costs for each project. An extra section has also been included outlining the results of public consultation as a result of the Long Term Council Community Plan (LTCCP) submissions.

2.0 DESCRIPTION OF THE CATCHMENT

Description of the Tanners Point Catchment

Tanners Point is a small settlement north of Katikati with a catchment area of approximately 30 Ha. The catchment is roughly triangular in shape bordering the Tauranga Harbour on two sides and rural land on the third. The actual stormwater catchment area extends from the western residential boundary to the end of the peninsula and to the north of Tanners Point Road (before the bend in the road). A map showing the location of Tanners Point is given in Appendix A.

Soil Type and Characteristics

The soil type is predominantly Katikati sandy loam. This type of soil drains well and does not easily erode. Katikati sandy loam is suitable for residential development (including the installation of septic tanks) and horticulture such as orchards.

Land Use

The Tanners Point area is predominantly zoned for residential (approximately 95%), the remainder is zoned rural H. The catchment has minimal potential for subdivision or expansion, based on the current district plan residential zoning regulations. Appendix B shows the actual zoning boundaries for Tanners Point.

3.0 REGULATORY INFORMATION

Western Bay of Plenty Subdivision and Development Code of Practice – 2001 Edition

The Subdivision and Development Code of Practice (COP) is in place to

“maximise efficient use of resources to ensure that any development in the district is to an appropriate long term, cost effective and minimum uniform standard which benefits the community”.

The COP outlines detailed requirements for the stormwater network. A summary of the main requirements that relate to the Tanners Point catchment are as follows:

- The use of soak holes for stormwater disposal is not permitted at Tanners Point.
- The minimum design standard for a primary (piped) stormwater system in the District is a 5-year return period (20% Annual Exceedance Probability (AEP)).
- The minimum design standard for stormwater systems to protect important recreation fields, and streets without alternative access is a 10-year return period (10% AEP).
- The minimum design standard for stormwater systems to protect residential property, commercial and industrial buildings is a 50-year return period (2% AEP).
- The minimum design of stormwater systems to protect major communal facilities related to supply of electricity, telecommunications and water and sewage disposal systems and bridges is a 100-year return period (1% AEP).

Western Bay of Plenty District Plan

The residential zone rules specify the following as a controlled activity:

"More than one dwelling per lot, subject to a minimum net land area of 350m² per dwelling on sewerred lots and 800m² on unsewered lots".

The Tanners Point catchment is unsewered.

Environment Bay of Plenty

Environment Bay of Plenty (EBOP) has approved General Authorisation No 8 to provide for relatively small stormwater discharges. This authorisation dates back to the Water and Soil Conservation Act, which permitted a Regional Council to authorise a number of minor or inconsequential uses of natural water by issuing a General Authorisation. When the Resource Management Act came into effect each General Authorisation became incorporated into the regional rules.

The provisions of General Authorisation No 8 are as follows:

"Clean stormwater may be discharged (excluding waste) into natural water provided that:

- a) The maximum discharge shall not exceed the flow from a 300 mm pipe on a flat grade or equivalent of 80 litres per second.*
- b) The suspended solids concentration of the water discharged does not exceed 150 g/m³.*
- c) The water discharged is substantially free of grease and oil.*
- d) The works shall be designed, constructed and maintained in such a manner so as not to cause erosion or flooding or to adversely affect any land or property owned or occupied by another person".*

4.0 EXISTING INFORMATION

Stormwater Network

The catchment currently consists of approximately 2 kilometres of stormwater pipe, 55 manholes and 24 catch pits. Pipe sizes range from 150 mm to 300 mm in diameter and are made from uPVC or concrete. The stormwater in this catchment is predominantly piped or channeled to outlets at the harbour. Tanners Point Road acts as the main watershed for the catchment. The subcatchments are generally small with minor pipe systems. Appendix B shows a map of the existing stormwater reticulation.

There are four receiving water areas for this catchment (see the Wildland Report Figure 2 in Appendix C):

- Tanners Point Reserve

This is a man made channel, approximately 0.5m wide and 0.3m deep around the perimeter of Tanners Point Reserve, a small number of pipes discharge to the channel.

- Northeast Tanners Point

A single stormwater outlet discharges at the harbour margin adjacent to a public walking track. The stormwater is piped underground from the settlement.

- Estuarine Outlet

An outlet to the estuary margin, from a small man made channel, which is approximately 0.3m wide, 0.2m deep, and 10m long.

- Freshwater wetland

North of Tanners Point Road on privately owned farmland is a small freshwater wetland. There is a stormwater outlet at the southern end of the wetland, which receives stormwater via an underground pipe from Tanners Point Road.

Marine Receiving Water Quality

EBOP regularly sample four sites (five in 2003/2004) throughout the bathing season (the start of November till the end of March) near the Tanners Point catchment. The location of the sites is shown in appendix A. Following is a table showing the sampling sites, sample site number and the median enterococci value (cfu/100ml) for the 2003/2004, 2004/2005 and 2005/2006 bathing seasons.

Sampling Site	Sampling Site Number	Median Enterococci Result (cfu/100mL)		
		2003/2004	2004/2005	2005/2006
Ongare Point – End of Ongare Pt Road	BOP160023	3	2	2
Tanners Point Beach	BOP160031	30	2	1
Anzac Bay – Bowentown Domain	BOP160028	24	2	8
Pios Ocean Beach	BOP160029	3	Not sampled	Not sampled
Athenree Motor Camp	BOP160030	9	9	26

All the sampling results are assessed against the Marine Water Quality Guidelines, which are as follows:

Safe Mode	single sample < 140 cfu/100ml
Amber / Alert Mode	single sample > 140 cfu/100ml
Red / Action Mode	2 consecutive samples over 280 cfu/100ml

In the 2003/2004 bathing season only one sample was higher than 140 cfu/100ml, the rest are all under. This higher sample was taken at the Anzac Bay site and recorded 180 cfu/100ml. The following samples were back in the safe mode zone. All samples in the 2004/2005 sampling programme were under 140 cfu/100ml. In early February 2005 three sites recorded samples over 140 cfu/100ml, they were at Athenree Motor Camp, Ongare Point and Tanners Point. The samples taken the following day were back within the safe mode zone.

Ecological Characteristics

A report prepared in November 2003 by Wildland Consultants for Duffill Watts and King Ltd presented a summary of ecological information, habitat and vegetation characteristics of the Tanners Point area. They collated information from the Western Bay of Plenty District Plan, Bay of Plenty Regional Coastal Environment Plan (RCEP) and previous reports commissioned by the Bay of Plenty Regional Council. A summary of this information is shown below.

Six significant natural areas were identified from the WBOPDC District Plan and RCEP. These are as follows (see the Wildland Report Figure 1 in Appendix C):

Western Bay of Plenty District Plan

- Site S8 Tauranga Harbour Landward Edge

This area is identified as visually significant and includes all the land 40 metres inland from mean high water springs (MHWS). The Tauranga Harbour is recognised in the RCEP as an "Area of Significant Conservation or Cultural Value" and also as an "Outstanding Natural Feature or landscape".

- Site U13/22 Inlet

The inlet is a protected significant ecological feature due to pohutukawa forest and tree land and is classed as moderate conservation value.

- Site U12/23 Tanners Point

Site U12/23 is a protected significant ecological feature consisting of pohutukawa forest and tree land.

- Site T13/7-8 Tuapiro

Tuapiro is a protected significant ecological feature of pohutukawa tree land of which the northern area is within the Tanners Point catchment boundary.

Bay of Plenty Regional Coastal Environment Plan

- Site SSCMA-2 Wolseley Road

A report by Owen in 1993 entitled "Protection and Restoration of Marsh Bird Habitat in Tauranga Harbour" ranks this site as a

moderate habitat quality for marsh birds. This includes the north island fernbird and the banded rail; both have been identified as at-risk in previous surveys.

- Site 85 Tanners Point

This is a regional significant natural feature or landscape, which includes the vegetated headland cliffs of Tanners Point.

A further site, Tanners Point Inlet, has been identified by Owen (1993) but has not been included in the RCEP. This site has been ranked as a moderate habitat for marsh birds (shown as Site 12 in Figure 1 of the Wildland Report).

Vegetation and Habitats

Tanners Point catchment has no major waterways and the stormwater is mostly channeled or piped via outlets to the harbour.

The channel at Tanners Point Reserve is viewed to have little or no ecological value but the receiving harbour is designated an "Area of Significant Conservation or Cultural Value" and an "Outstanding Natural Feature or Landscape". A study of the immediate harbour receiving environment found small beds of seagrass and macro invertebrates including burrowing mud crab, mud whelk, sand dollar, pipis and cockles. Bird species such as kingfisher, red-billed gull, pied shag, black-backed gull and white-faced heron are all found in the outlet area.

The estuarine inlet channel was also viewed to have no ecological value with the channel and surrounding area over grown with pest plants such as pampas, gorse, blackberry, wild ginger, Japanese honeysuckle and Chinese privet. As previously the receiving estuarine environment is identified as being of moderate quality for marsh birds.

The freshwater wetland, which is present in a gully system, is highly modified and contains pest plants; it merges into estuarine vegetation to the north consisting of oioi and searush sedgeland with a few pohutukawa and willow trees present. Fernbird and banded rail have been sighted in the estuarine habitat in previous studies. The gully has been identified as being vulnerable to long-term landslip in the WBOPDC District Plan. The landowner has planted part of the upper section of the gully on the western side.

5.0 CONSTRAINTS AND MODELING ANALYSIS

The WBOPDC data for the Tanners Point catchment was adapted and used together with a detailed topographical survey of the entire catchment for the construction of a MOUSE drainage model of the area. This method of analysis allows accurate representation of existing and future systems and is only limited by the accuracy of the data used. A topographical survey of the catchment confirmed council GIS data of existing reticulation features.

The maximum probable development potential in the catchment was approximated by assuming a maximum impervious ratio of 35% (this equates to a C factor of 0.5), which was based on a statistical development figure for Katikati prior to reticulated sewerage. The maximum development potential therefore is based on current Code of Practice and District Plan requirements, a minimum lot size of 800m². Should permitted activities change the recommendations may no longer be representative. The Tahawai area population is expected to grow by approximately 34% by the year 2021 with the possible expansion at Tanners Point absorbed by infill subdivision and rezoning. Infill subdivision is covered by the assumed maximum impervious ratio and current development constraints. Adjacent catchments are independent of the currently zoned residential catchments.

The annual exceedance probability (AEP) used was 2% (i.e. equivalent to a 50-year return period) to determine potential areas of flooding. In all cases piped reticulation was sized using a 20% AEP event, unless no safe secondary flowpath was available, in which case the 2% AEP was used.

It has been assumed in this study that no reticulated sewerage will be available. If this should change the recommended upgrades in this report may not meet Councils current LOS (level of service) requirements without additional constraints on private stormwater discharges.

6.0 IDENTIFIED STORMWATER PROBLEMS

Network

The MOUSE model was used to check the capacity of the existing stormwater system, determine flooding levels and identify required upgrades to the system. Two major flooding areas were identified. The low point in Moana Drive (number 2) and the dead end of Baigent Place are all flood prone in heavy rain events. These problems are due to the development of sections across the natural flow paths, increasing the risk of flooding in the properties in a 50-year flood. The existing piped stormwater system would be unable to cope with the predicted flow resulting in the excess water flowing through the properties. For this reason these systems have been given a high priority.

The removal of deficient systems has been prioritised using three categories: high, medium and low. The following criteria were used to categorise these systems.

1. High – Upgrades of deficient systems that could cause major flooding of private property if not upgraded.
2. Medium – Upgrades of deficient systems to alleviate flooding of private property.
3. Low – Upgrades of deficient systems in flooding areas that do not cause major problems and do not flood private property.

Deficient systems are those that do not meet Councils current code of practice requirements under maximum probable development. Details of the deficient systems are listed in Appendix E and illustrated in Appendix F.

Upgrading sections of the stormwater pipe network will provide enough capacity to cope with a 5-year return period event. Excess flows will also be safely managed in secondary systems and controlled flooding areas. Appendix D contains a map showing the floodable areas.

Section 8 outlines how this network deficiency information was utilised to prioritise the stormwater works in conjunction with other factors.

Ecological

The receiving waters for the Tanners Point catchment are all viewed as significant natural areas; however the channel at Tanners Point Reserve, as well as the estuarine inlet channel, is reported to have little or no ecological value. These channels are currently not adequately managed and their ecological well being could be improved.

The freshwater wetland in the catchment is highly modified and contains pest plant species. The gully has been identified as being vulnerable to landslip in the WBOPDC District Plan. Management of this area is also required to prevent the erosion.

Pollution

No industrial or commercial areas exist at Tanners Point. Catchments are residential or rural/residential use with relatively low traffic volumes, producing limited pollution potential. No specific treatment systems are recommended other than the control of erosion caused by high velocity stormwater flows.

7.0 PUBLIC CONSULTATION

The recommendations from the second version of this report were included in the latest LTCCP. The LTCCP was then released for public consultation.

Submissions were received regarding the proposed capital works programme for Tanners Point, these are summarised in appendix H.

In May 2006 DWK Engineers' (on behalf of WBOPDC) met the President of the Tanners Point Residents' and Ratepayers' Association onsite to discuss the submissions.

The key areas of concern identified were as follows;

- ◆ Lack of piping on Tanners Point Road down the hill to the Reserve
- ◆ Stormwater flowing through the property at 236 Tanners Point Road
- ◆ Moana Drive
- ◆ Further up Baigent Place than the proposed upgrade
- ◆ Tanners Point Reserve Drainage
- ◆ Accessway at the end of Giles Way

The work programme was then reprioritised to incorporate the views of the residents. In the modelling process Giles Way was not identified as

having stormwater problems due to the overland flow path available; for this reason no work had been proposed. This job has now been prioritised and added to the capital works programme. At the next round of LTCCP review late 2008 or early 2009 this job will be submitted for inclusion in the LTCCP.

A point was also made regarding the outfall at Moana Place. The end of the outfall has been landscaped by the residents who would like to see it remain as it is. This issue will be addressed at the time of design.

A submission was made regarding gravel deposits at the corner of State Highway 2 and Tanners Point Road and the safety issue in heavy rain. This problem is outside the jurisdiction of Utilities and is a roading concern.

8.0 REMEDIAL METHODS

All recommended remedial methods are determined using maximum probable development information based on the Code of Practice (2001) and District Plan constraints (see Section 5). It is assumed that no reticulated wastewater system will be available for this area therefore minimum section sizes are 800m² (similar to Katikati before reticulated sewerage was installed).

Network

Details of the recommended upgrades, predicted costs and proposed programme are shown in Appendices E and G. The Development Impact Fee (DIF) contribution is the estimated proportion of the cost of increasing the pipe sizes if subdivision was to occur. This was calculated by assessing the requirements and cost of upgrading the system to cater for existing development and comparing the results with the requirements and cost involved in upgrading the system to cater for potential maximum development. The difference between these two costs gives the total DIF amount.

The order of work listed in the proposed works programme (Appendix G) was established by ranking the work based on priority. A number of factors were utilised to prioritise the capital works, these include; whether the system meets code of practice requirements (based on modeling), whether the public perceive a need for the work, how many properties are affected and if there is a previous history of flooding or other stormwater related problems. These factors were all considered to calculate a cost per property for the work. In this ranking system the lower the cost per property the more benefit is gained from completing the works. The table showing the ranking information is shown in Appendix G.

Methods other than a piped system were considered but topographical and space constraints prevent other options such as ponds or swales being used.

Appendix F contains a map showing green coloured areas which can be developed without any upgrade of the stormwater systems. Red areas require stormwater upgrades before development can occur, or restrictions placed on new stormwater discharges.

The approximate cost of the proposed capital works is \$749,820 excl GST. This work is proposed to be started in the 2006/2007 financial year and would take 12 years based on current LTCCP funding allocation.

There is estimated to be additional maintenance costs from laying new pipe. The predicted cost is approximately \$870 per annum from 2007/2008. This additional money covers physical maintenance of the asset, rates, insurance and network management costs.

Ecological

The report produced by Wildland Consultants outlines recommendations for future management to protect the stormwater receiving environment. The report recommends the following to improve the ecological well being of the catchment:

- Plant the margins of stormwater channel in Tanners Point Reserve with indigenous species to serve as a buffer for stormwater entering the harbour.
- Create a 10-20m riparian buffer of indigenous vegetation around the freshwater wetland to enhance the wetland habitat and create a buffer for stormwater entering the estuary¹.
- Exclude stock from the gully and plant with indigenous species to help stabilise banks and prevent sedimentation¹.

This work was also prioritised using the same method as for the piped systems. The total cost of the three projects is expected to be around \$27,500 excl GST. Work is scheduled to start in the 2006/2007 financial year and the other two projects in the 2015/2016 financial year. This work could become part of community projects.

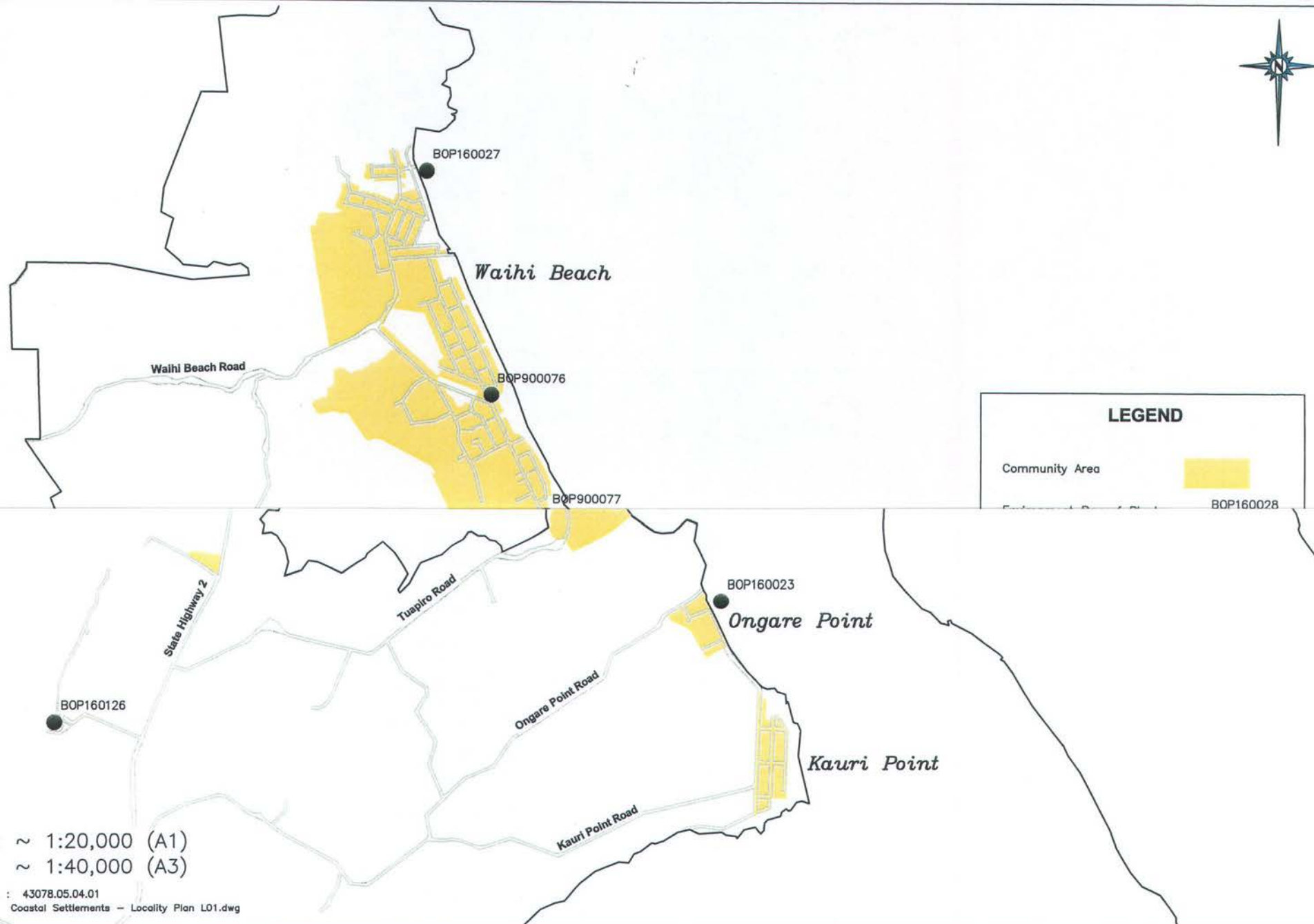
¹ Consultation and collaboration with the landowner would be necessary.

9.0 RECOMMENDATION

It is recommended that the suggested capital works be completed in the order as defined by this report. Changes in priority were made based on maintenance history, community views and code of practice standards.

APPENDIX A

Location of the Tanners Point Catchment and EBOP Sampling Sites



LEGEND


Community Area

Future Development

BOP160028

Scale: ~ 1:20,000 (A1)
 ~ 1:40,000 (A3)

Project No. : 43078.05.04.01
 Dwg. File : Coastal Settlements - Locality Plan L01.dwg





<p>Client</p> 	<p>Project</p> <p>SMALL SETTLEMENTS CATCHMENT MANAGEMENT PLAN</p>	<p>Sheet Title</p> <p>LOCALITY PLAN</p>	<p>Job No.</p> <p>43078</p>	<p>Sheet No.</p> <p>L01</p>	<p>Duffill Watts & King Ltd CONSULTING ENGINEERS</p>
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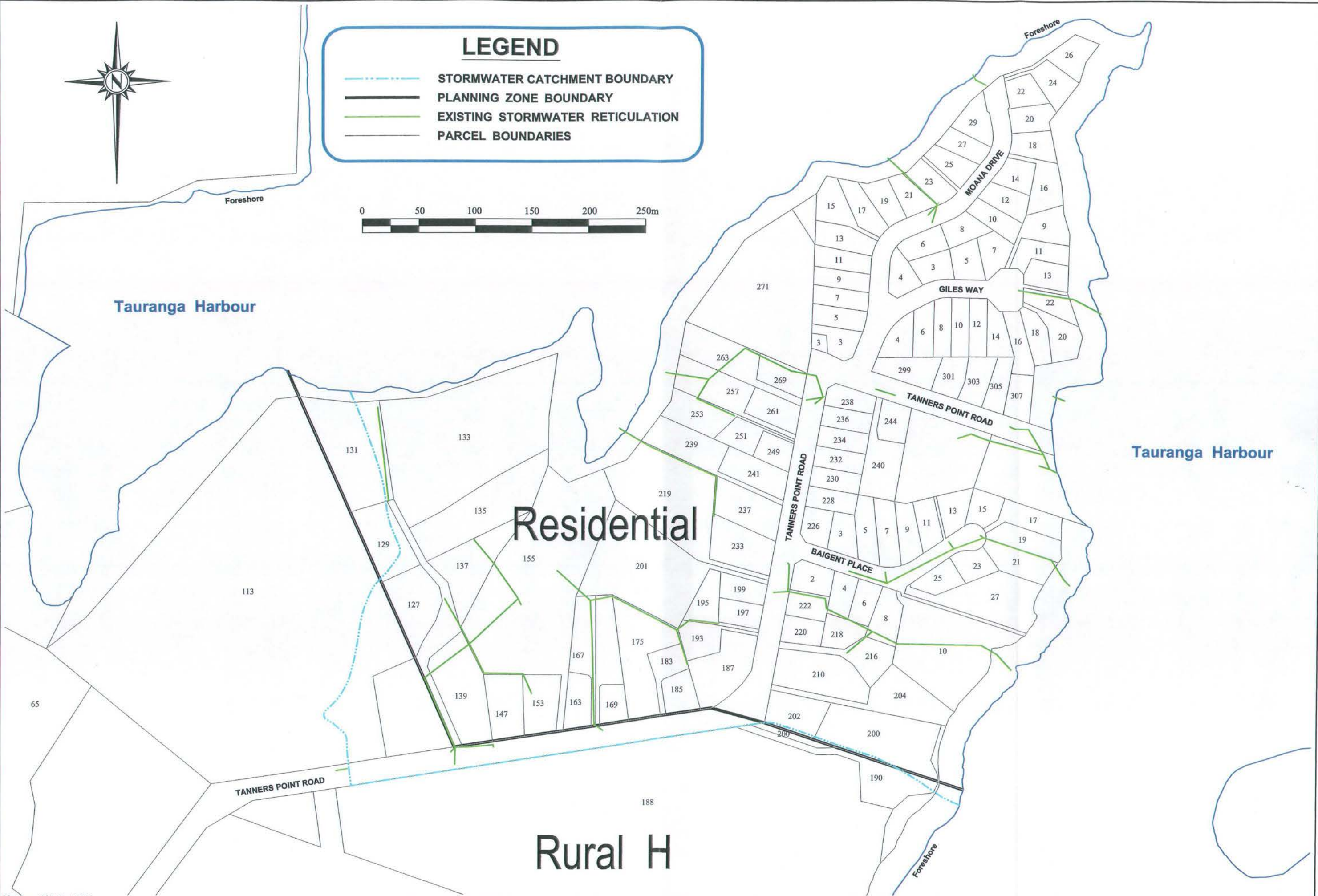
APPENDIX B

Tanners Point District Plan Zoning Area and Existing Stormwater Pipe Network



LEGEND

-  STORMWATER CATCHMENT BOUNDARY
-  PLANNING ZONE BOUNDARY
-  EXISTING STORMWATER RETICULATION
-  PARCEL BOUNDARIES



Version : 20 July - 2006

Scales: ~ 1:1500 (A1)
~ 1:3000 (A3)

Project No. : 43078.05.04.01
Dwg. File : Coastal Areas P01-4_zoning.dwg Tanners Pt. P04

Client  Western Bay of Plenty District Council

Project **TANNERS POINT CATCHMENT MANAGEMENT PLAN**

Sheet Title **PLAN ZONING AREAS**

Job No. **43078**
Sheet No. **P04**
4 of 4 sheets

Duffin Watts & King Ltd
CONSULTING ENGINEERS

APPENDIX C

Wildland Report “Ecological Assessment of Stormwater Catchments of Tanners Point, Western Bay of Plenty District”

ECOLOGICAL ASSESSMENT OF
STORMWATER CATCHMENTS AT
TANNERS POINT, WESTERN BAY OF
PLENTY DISTRICT

NOVEMBER 2003

Contract Report No. 773a

Report prepared for

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PROJECT TEAM

William Shaw - Project management, oversight, report compilation.

Fiona Fields - Field work, report compilation.

Ian Kusabs - Fisheries assessment.

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1. INTRODUCTION

This project was commissioned by Duffill Watts and King for the Western Bay of Plenty District Council. The objectives of the project were to provide information to underpin the future management of stormwater in Tanners Point, a small settlement north of Katikati in the Western Bay of Plenty. The settlement is adjacent to Tauranga Harbour and rural land where the predominant land uses are pastoral and horticultural.

The study identifies and provides an assessment of the inflowing and receiving waterways within the Tanners Point stormwater catchment and recommendations are made for future stormwater management. This report provides a description of vegetation and habitats, outlines the species present, and provides an approach to the future management of stormwater in this area.

2. PROJECT OBJECTIVES

Wildland Consultants Ltd were commissioned by Duffill Watts and King to:

- Identify relevant available data sources.
- Collate and review existing information.
- Obtain relevant digital data.
- Assist with the development of objectives for the management of stormwater in Western Bay of Plenty settlements.
- Develop base map(s) showing land cover/vegetation/habitats, and the locations of streams, rivers, wetlands, and any other waterways.
- Map and describe significant natural resources, including networks of natural areas and receiving waters. Include all sites already identified in statutory planning documents.
- Describe and evaluate the relative health/condition of waterways flowing into settlements and receiving stormwater from settlements.
- Assess opportunities to improve stormwater management by the use of riparian protection, planting, stormwater detention, and treatment.
- Undertake above assessments by walk-through surveys along each waterway, capturing a photographic record of each one.

3. METHODOLOGY

Relevant ecological information was obtained from existing sources and significant natural areas within the catchment were identified and mapped.

A walk-through field inspection of the catchment was undertaken in November 2003. Waterways, wetlands, stormwater channels, and outflow points were inspected and assessments were made of ecological values.

4. SUMMARY OF EXISTING ECOLOGICAL INFORMATION

The following is a summary of ecological information for significant natural areas within and immediately adjacent to the Tanners Point catchment. This information has been compiled from literature sources including District and Regional Plans, and ecological reports, as well as digital data held by Wildland Consultants Ltd.

Beadel (1991) carried out a comprehensive survey and inventory of Tauranga Harbour wetland vegetation for the Bay of Plenty Regional Council. Priority areas for protection were identified and many of these sites have been included in the Seventh Schedule of the Bay of Plenty Regional Coastal Environment Plan (RCEP) - 'Significant Indigenous Vegetation Areas'.

Owen (1993) has carried out a survey of marshbird habitat within Tauranga Harbour and many of these sites have been included in the Sixth Schedule of the Bay of Plenty RCEP - 'Significant Marshbird Habitat Areas'.

Seven significant natural areas have been identified and included in the WBOP District Plan and Bay of Plenty RCEP, as listed below. The location of these sites is shown in Figure 1.

Western Bay of Plenty District Plan

- Site S8 Tauranga Harbour Landward Edge

This has been identified as a visually significant landscape feature and includes all the land in a strip 40 metres inland from Mean High Water Springs (MHWS). Tauranga Harbour is recognised in the Bay of Plenty RCEP as an 'Area of Significant Conservation or Cultural Value' and also as an 'Outstanding Natural Feature or landscape'.

- Site U13/22 – Inlet

Protected significant ecological feature consisting of pohutukawa (*Metrosideros excelsa*) forest and treeland; classed as moderate botanical conservation value. The vegetation of estuarine margins that lie within the study area include *Baumea juncea*-searush-oioi sedgeland (Beadel 1991).

- Site U13/23 – Tanners Point

A protected significant ecological feature consisting of pohutukawa forest and treeland.

- Site T13/7-8 – Tuapiro

Protected significant ecological feature of which the northern area within the catchment boundary comprises pohutukawa forest.

Bay of Plenty Regional Coastal Environment Plan

- Site SSCMA-2 - Wolseley Road

Ranked as moderate habitat quality for marshbirds by Owen (1993). North Island fernbird (*Bowdleria punctata* ssp. *vealeae*) and banded rail (*Gallirallus philippensis* ssp. *assimilis*), both classed as 'At Risk - Sparse' by Hitchmough (2002), were identified in both areas in a 1992 survey. The vegetation is dominated by searush (*Juncus maritimus*) and oioi (*Apodasmia similis*) sedgeland, with mangrove (*Avicennia marina* subsp. *australasica*) scrub on the seaward side. Areas of manuka (*Leptospermum scoparium*) scrub, marsh ribbonwood (*Plagianthus divaricatus*) scrub, *Olearia solandri*, and flaxland (*Phormium* spp.) are generally confined to wetland margins (Owen 1993).

- Site S5 - Tanners Point

Regionally significant natural feature or landscape comprising the vegetated headland cliffs of Tanners Point (see Site T13/7-8 above).

- Site 12 (Owen 1993) - Tanners Point inlet

This site has not been included in the Bay of Plenty RCEP, although it was ranked as moderate habitat quality for marshbirds by Owen (1993). North Island fernbird and banded rail were identified in both areas in the 1992 survey. Vegetation is predominantly searush sedgelands with oioi sedgelands and other mixed saltmarsh vegetation. Terrestrial margins are dominated by wattle (*Acacia* sp.), pohutukawa, and pasture.






5. VEGETATION AND HABITATS

No major waterways are present within the Tanners Point settlement and receiving stormwater is mostly channelised or piped to outlets on the harbour margin. The following is a description of the receiving waterways within the catchment and riparian habitats (refer to Figure 2). Photographs of each site are shown in Appendix 1.



Figure 1 Tanners Point - Significant Natural Areas

Legend

-  Catchment boundary
-  Stream
-  Significant Ecological Site
-  Significant marshbird habitat area
-  Council reserve

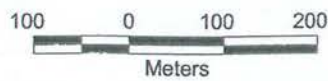
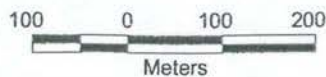




Figure 2 Tanners Point - landcover, stormwater outlets, and channels

Legend

-  Catchment boundary
-  Property boundary
-  Stream/channel
-  Stormwater outlet
-  Stormwater channel
-  TN1 Site ID
-  Rank grasses and scrub
-  Residential properties and roads
-  Estuarine wetland
-  Freshwater wetland
-  Coastal forest/scrub
-  Pasture/grassland
-  Reserve



Site TN1: Tanners Point Reserve (Plates 1-3, Appendix 1)

A human-made ephemeral stormwater channel (c.0.5m wide x 0.3m deep) is present around the perimeter of Tanners Point Reserve, which abuts residential properties. A number of small stormwater pipes enter the channel at various points. A section of the channel is piped underground from south of Tanners Point Road to the northern outlet. At the time of field inspection much of the channel was dry and the base flow to the southern outlet was estimated at 20ml/second.

Watercress (*Nasturtium officinale*) is present within the channel and the surrounding vegetation cover consists of lawn around the western half of the channel with a mosaic of exotic and indigenous shrubs and trees extending from the lawn to the harbour margin. A number of pest plant species are present, including Arum lily (*Zantedeschia aethiopica*), Chinese privet (*Ligustrum sinense*), wild ginger (*Hedychium flavescens*), and hydrangea (*Hydrangea macrophylla*) as well as numerous other exotic plant species which are present in residential gardens around the perimeter of the channel. Indigenous species present include taupata (*Coprosma repens*), *Hebe* spp., puriri (*Vitex lucens*), karamu (*Coprosma robusta*), flax (*Phormium tenax*), pohutukawa (*Metrosideros excelsa*), kawakawa (*Macropiper excelsum* var. *excelsum*), and coastal five finger (*Pseudopanax lessonii*).

The channel has little or no ecological value. However the receiving harbour environment has been designated as an 'Area of Significant Conservation or Cultural Value' and an 'Outstanding Natural Feature or Landscape'. A study of the intertidal substrate and vegetation of the immediate harbour receiving environment was carried out by Shaw and Miller (2002). Small beds of seagrass (*Zostera muelleri*) as well as a number of inter-tidal macroinvertebrates including burrowing mud crab (*Helice crassa*), mud whelk (*Cominella glandiformis*), sand dollar (*Fellaster zelandiae*), pipis (*Paphies australis*), and juvenile cockles (*Chione stutchburyii*) were found here. The harbour area is utilised by common coastal bird species such as kingfisher (*Halcyon sancta*), red-billed gull (*Larus novaehollandiae*), pied shag (*Phalacrocorax varius*), black-backed gull (*Larus bulleri*), and white-faced heron (*Ardea novaehollandiae*). Common terrestrial species such as sparrow (*Passer domesticus*) and chaffinch (*Fringilla coelebs*) are present within the reserve.

Site TN2: Northeast Tanners Point (Plate 4, Appendix 1)

A stormwater outlet point is present at the harbour margin adjacent to a public walking track within pohutukawa forest (Site U13/23). The receiving stormwater is piped underground from the settlement.

Site TN3: Estuarine inlet (Plate 5, Appendix 1)

A stormwater outlet is present at the estuary margin, leading from a very small ephemeral channel. The channel is approximately 0.3 m wide x 0.2 m deep x 10 m long and was mostly dry at the time of field inspection. The channel and surrounding area is overgrown with a number of pest plant species including pampas (*Cortaderia selloana*), gorse (*Ulex europaeus*), blackberry (*Rubus fruticosus*), wild ginger, Japanese honeysuckle (*Lonicera japonica*), and Chinese privet. The channel itself has no

ecological value, although the receiving estuarine environment has been identified as being of moderate quality for marshbirds (Owen 1993).

Site TN4: Freshwater wetland (Plates 6-8, Appendix 1)

A small freshwater wetland is present within a gully system to the North of Tanners Point Road on privately-owned farmland. A stormwater outlet point is situated at the southern end of the wetland which receives stormwater via an underground pipe from Tanners Point Road. At the time of field inspection there was no stormwater flow into the wetland.

The wetland is highly modified *Carex* sp.-dominant sedgeland with occasional swamp kiokio (*Blechnum novae-zelandiae*) and rank grasses, surrounded by grazed pasture. A number of kanuka (*Kunzea ericoides* var. *ericoides*) are present around the perimeter of the wetland which is fenced to exclude domestic stock. The wetland merges into estuarine vegetation to the north consisting of oioi and searush sedgeland with a few planted pohutukawa and a number of willow (*Salix* sp.) also present. No avifauna species were noted at the time of field inspection, however Owen (1993) recorded fernbird and banded rail in the adjacent estuarine habitat.

The gully has been identified as being vulnerable to long-term landslip in the Western Bay of Plenty District Plan and it was noted that the landowner had planted part of the upper section of the gully on the western side.

6. FUTURE MANAGEMENT

The following general principles should be followed for stormwater management:

- Ensure that existing ecological values are protected, and enhanced if possible. In the Western Bay of Plenty this includes freshwater wetlands (even if small and degraded), streams (including provision for fish passage if they provide habitat for freshwater fish), remnants of terrestrial indigenous vegetation (even small remnants are of significant ecological value), wader habitat in estuaries, and saltmarsh vegetation and fauna habitats in estuaries.
- Provide detention and settling areas within the stormwater catchment, to avoid or minimise inflows of contaminants into receiving waters.
- Provide information to landowners who contribute stormwater (subject to protection or enhancement of above features), advising them of the potential damage caused by the introduction of contaminants into the stormwater system.
- Consult with landowners where stormwater channels and receiving waters are within privately-owned land and work in collaboration (where possible) to achieve a holistic approach to stormwater management.
- Provide, where possible, vegetated riparian buffers along all open stormwater channels that have actual or potential ecological values (with provision for ongoing maintenance if required).

- Riparian buffers should be planted with locally-sourced indigenous species appropriate to the site character (lists of species can be provided if required).
- Manage the stormwater system as part of an integrated network of public open space and natural areas recognising that even small streams, wetlands, and other natural features may have significant ecological values.

Stormwater in the study area is mostly piped or channelled to outlets at the harbour edge. The stormwater channel that traverses the perimeter of the Tanners Point Reserve has little or no ecological value. However, there is merit in planting the margins with indigenous species to provide a link with indigenous vegetation on either side of the reserve (Sites U13/23 and T13/7-8). This will also provide a buffer for stormwater entering the harbour at times of peak flow. The beds of seagrass on the intertidal flats are worthy of protection as seagrass has suffered large reductions in Tauranga Harbour (Park 1999). The pipi bed in the channel is of value as kaimoana and as such is also worthy of protection. The management of stormwater entering the harbour should therefore take these factors into consideration.

There are no permanently flowing streams within the Tanners Point study area although there is a small freshwater wetland situated within a gully that receives stormwater from a piped drainage system. This wetland is situated on privately-owned land and adjoins an estuarine wetland which contains significant marshbird habitat (Site 12, Owen 1993) and a significant ecological feature (Site U13/22). The banks of the gully are vulnerable to long term landslip (WBOP District Plan 2002) and are currently in pasture. Although the freshwater wetland is highly modified there is potential for restoration of the wetland including removal of pest plants and planting of the gully and riparian margins with indigenous species to enhance the wetland habitat and stabilise banks. The Environment Bay of Plenty Land Management Plan also promotes the protection and enhancement of existing wetlands as this habitat type is underrepresented on a regional scale. It is recommended that stock are excluded from this area and a 10-20 m buffer zone is planted on either side of the riparian margins. Restoration of this area will help stabilise banks, preventing sedimentation, as well as providing a buffer zone for stormwater entering significant natural areas within the estuarine zone.

A summary of future management recommendations for Tanners Point is as follows:

- Plant the margins of the stormwater channel in Tanners Point Reserve with indigenous species to serve as a buffer for stormwater entering the harbour.
- Create a 10-20 m riparian buffer of indigenous vegetation around the freshwater wetland to enhance wetland habitat and create a buffer for stormwater entering the estuary¹.
- Exclude stock from the gully and plant with indigenous species to help stabilise banks and prevent sedimentation¹.

¹ Consultation and collaboration with the landowner will be necessary to achieve these objectives.

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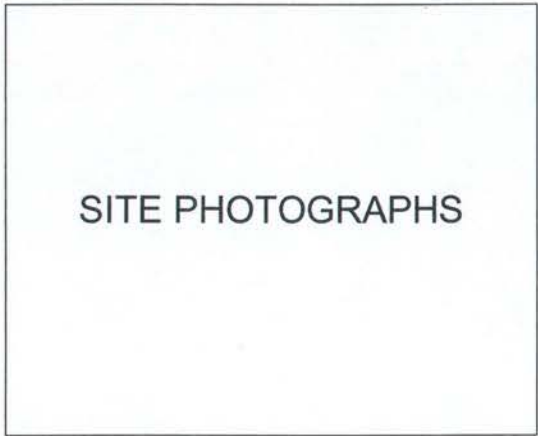




Plate 1: Site TN1 - Stormwater channel around western perimeter of Tanners Point Reserve.



Plate 2: Site TN1 - Stormwater outlets to Tanners Point Reserve stormwater channel and in-channel vegetation.



Plate 3: Site TN1 - Stormwater outlet at harbour margin from Tanners Point Reserve stormwater channel.



Plate 4: Site TN2 - Stormwater pipe entering outlet at harbour edge (right), northeast Tanners Point.



Plate 5: Site TN3 - Stormwater outlet at estuary margin.



Plate 6: Site TN4 - Gully and southern end of freshwater wetland with stormwater outlet (far end of wetland).



Plate 7: Site TN4 - Mid-section of freshwater wetland and gully.







Plate 8: Site TN4 - Northern end of freshwater wetland where it merges into estuarine wetland.

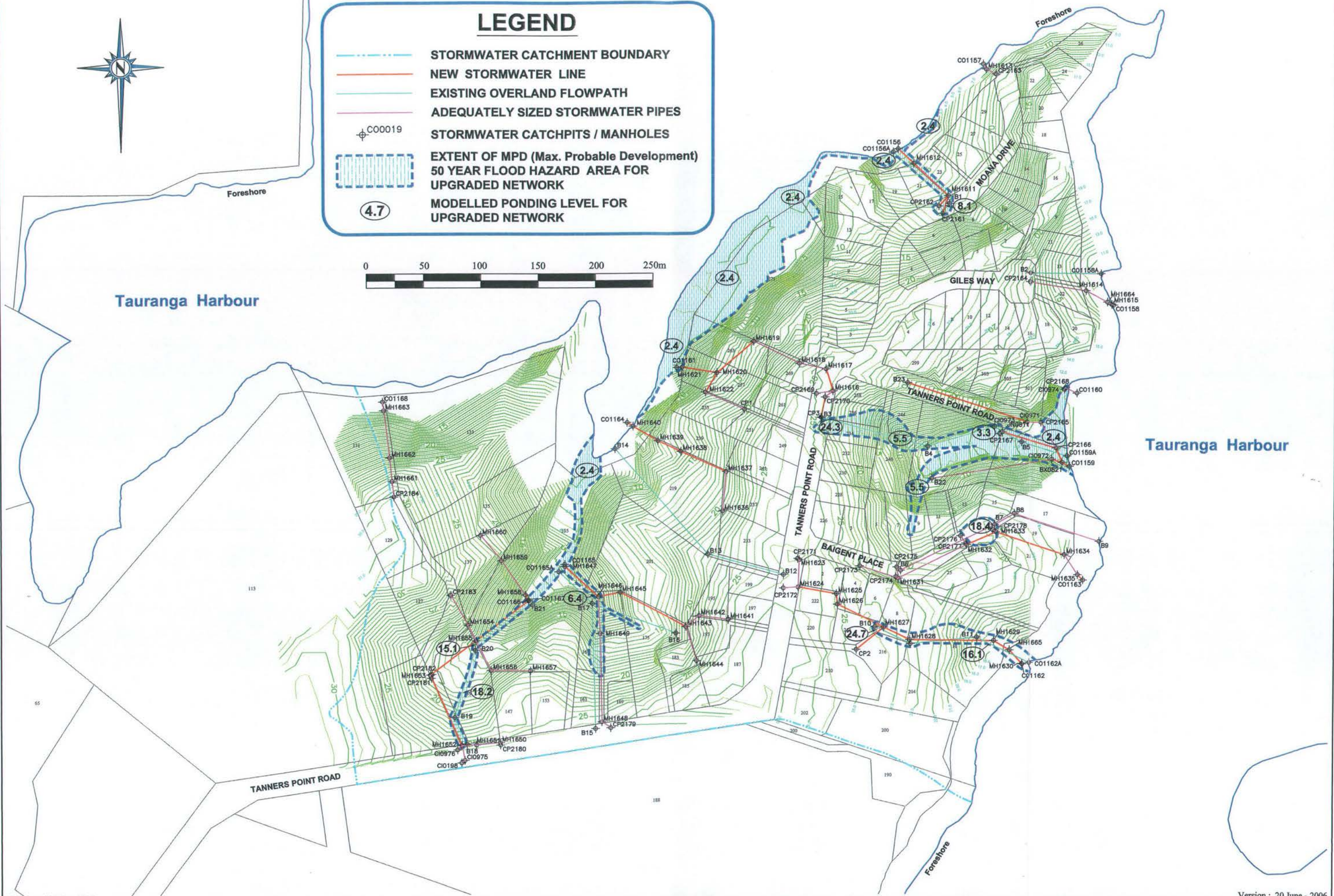
APPENDIX D

Map of the Floodable Areas



LEGEND

- STORMWATER CATCHMENT BOUNDARY
- NEW STORMWATER LINE
- EXISTING OVERLAND FLOWPATH
- ADEQUATELY SIZED STORMWATER PIPES
-  C00019
- STORMWATER CATCHPITS / MANHOLES
-  EXTENT OF MPD (Max. Probable Development)
-  50 YEAR FLOOD HAZARD AREA FOR UPGRADED NETWORK
-  4.7
- MODELLED PONDING LEVEL FOR UPGRADED NETWORK



Tauranga Harbour

Tauranga Harbour

Version : 20 July - 2006

Version : 20 June - 2006

Scales: ~ 1:1500 (A1)
~ 1:3000 (A3)

Client  Western Bay of Plenty District Council

Project **TANNERS POINT CATCHMENT MANAGEMENT PLAN**

Sheet Title **PLAN FLOOD HAZARD AREAS (UPGRADED NETWORK)**

Job No. **43078**
Sheet No. **P04**
5 of 5 sheets

Duffin Watts & King Ltd
CONSULTING ENGINEERS

APPENDIX E

Recommended Stormwater Upgrades, Prioritisation and Costs

Capital Works Details

Job Name	Link To	Link From	Priority	Exist size (mm)	Upgrade size (mm)	Length (m)	Pipe Cost/m (\$)	No. of manholes	Cost per man hole	No of Outlets / Inlets	Cost per outlet / Inlet	No. of catch pits	Cost per Catch pit	Amount (\$)	Amount per job (\$)
Moana Drive	MH1611	MH1612	High	225	375	41	\$370	2	\$4,540	0	\$3,200	0	\$1,910.00	\$24,250	\$52,410
	MH1612	CO1156	High	225	375	19	\$370	1	\$4,540	1	\$3,200	0	\$1,910.00	\$14,770	
	CP2161	MH1611	High	225	300	17	\$330	0	\$4,540	0	\$3,200	1	\$1,910.00	\$7,520	
	CP2162	MH1611	High	225	300	12	\$330	0	\$4,540	0	\$3,200	1	\$1,910.00	\$5,870	
Baigent Place	MH1632	MH1633	High	300	375	28	\$370	1	\$4,540	1	\$3,200	0	\$1,910.00	\$18,100	\$72,200
	MH1633	MH1634	High	300	450	64	\$440	1	\$4,540	0	\$3,200	0	\$1,910.00	\$32,700	
	MH1634	MH1635	High	300	450	21	\$440	1	\$4,540	0	\$3,200	0	\$1,910.00	\$13,780	
	MH1635	CO1163	High	300	450	7	\$440	1	\$4,540	0	\$3,200	0	\$1,910.00	\$7,620	
Tanners Point Road (1)	B23	CI0971	High	No pipe	300	112	\$330	1	\$4,540	1	\$3,200	0	\$1,910.00	\$44,700	\$44,700
Tanners Point Road West (1)	CP3	CP2107	Medium	No pipe	300	20	\$330	0	\$4,540	0	\$3,200	2	\$1,910.00	\$10,420	\$26,100
	MH1616	MH1617	Medium	225	300	20	\$330	2	\$4,540	0	\$3,200	0	\$1,910.00	\$15,680	
Tanners Point Road East Stage 1	MH1619	MH1620	Medium	225	300	43	\$330	2	\$4,540	0	\$3,200	0	\$1,910.00	\$23,270	\$54,030
	MH1620	MH1621	Medium	225	300	31	\$330	1	\$4,540	0	\$3,200	0	\$1,910.00	\$14,770	
	MH1621	CO1161	Medium	225	300	5	\$330	0	\$4,540	1	\$3,200	0	\$1,910.00	\$4,850	
	MH1622	MH1620	Medium	150	300	20	\$330	1	\$4,540	0	\$3,200	0	\$1,910.00	\$11,140	
Tanners Point Road East Stage 2	MH1624	MH1625	Medium	225	300	34	\$330	2	\$4,540	0	\$3,200	0	\$1,910.00	\$20,300	\$72,460
	MH1625	MH1626	Medium	225	300	9	\$330	1	\$4,540	0	\$3,200	0	\$1,910.00	\$7,510	
	MH1626	MH1627	Medium	225	300	46	\$330	1	\$4,540	0	\$3,200	0	\$1,910.00	\$19,720	
	MH1627	MH1628	Medium	225	300	25	\$330	1	\$4,540	0	\$3,200	0	\$1,910.00	\$12,790	

Job Name	Link To	Link From	Priority	Exist size (mm)	Upgrade size (mm)	Length (m)	Pipe Cost/m (\$)	No. of manholes	Cost per man hole	No of Outlets / Inlets	Cost per outlet / Inlet	No. of catch pits	Cost per Catch pit	Amount (\$)	Amount per job (\$)
	CP2	MH1627	Medium	150	300	31	\$330	0	\$4,540	0	\$3,200	1	\$1,910.00	\$12,140	
Tanners Point Road (2)	MH1628	MH1629	Medium	225	300	73	\$330	2	\$4,540	0	\$3,200	0	\$1,910.00	\$33,170	\$57,020
	MH1629	MH1665	Medium	225	300	16	\$330	1	\$4,540	0	\$3,200	0	\$1,910.00	\$9,820	
	MH1665	MH1630	Medium	225	375	16	\$370	1	\$4,540	0	\$3,200	0	\$1,910.00	\$10,460	
	MH1630	CO1162	Medium	225	375	1	\$370	0	\$4,540	1	\$3,200	0	\$1,910.00	\$3,570	
Tanners Point Rd West (2)	CP2166	BX0821	Low	300	600	14	\$560	1	\$5,260	0	\$3,200	1	\$1,910.00	\$15,010	\$65,190
	BX0821	CO1159	Low	300	600	7	\$560	0	\$5,260	1	\$3,200	0	\$1,910.00	\$7,120	
	CI0972	BX0821	Low	225	375	10	\$370	0	\$4,540	1	\$3,200	0	\$1,910.00	\$6,900	
	JN0811	CP2166	Low	300	525	50	\$490	1	\$4,540	0	\$3,200	0	\$1,910.00	\$29,040	
	CI0973	JN0811	Low	225	525	8	\$490	0	\$4,540	1	\$3,200	0	\$1,910.00	\$7,120	
Tanners Point Rd North (1)	MH1637	MH1638	Low	150	300	43	\$330	2	\$4,540	0	\$3,200	0	\$1,910.00	\$23,270	\$53,040
	MH1638	MH1639	Low	150	300	22	\$330	1	\$4,540	0	\$3,200	0	\$1,910.00	\$11,800	
	MH1639	MH1640	Low	150	300	25	\$330	1	\$4,540	0	\$3,200	0	\$1,910.00	\$12,790	
	MH1640	CO1164	Low	150	300	6	\$330	0	\$4,540	1	\$3,200	0	\$1,910.00	\$5,180	
Tanners Point Rd North (2)	MH1643	MH1645	Low	150	300	65	\$330	2	\$4,540	0	\$3,200	0	\$1,910.00	\$30,530	\$68,690
	MH1645	MH1646	Low	150	375	20	\$370	1	\$4,540	0	\$3,200	0	\$1,910.00	\$11,940	
	MH1646	MH1647	Low	300	450	40	\$440	1	\$4,540	0	\$3,200	0	\$1,910.00	\$22,140	
	MH1647	CO1165	Low	300	450	2	\$440	0	\$4,540	1	\$3,200	0	\$1,910.00	\$4,080	
Tanners Point Rd North (3)	MH1652	MH1653	Low	200	450	68	\$440	2	\$4,540	0	\$3,200	0	\$1,910.00	\$39,000	\$103,980
	MH1653	MH1655	Low	300	450	50	\$440	1	\$4,540	0	\$3,200	0	\$1,910.00	\$26,540	
	MH1655	CO1166	Low	300	450	58	\$440	0	\$4,540	1	\$3,200	0	\$1,910.00	\$28,720	
	MH1658	CO1167	Low	150	300	6	\$330	1	\$4,540	1	\$3,200	0	\$1,910.00	\$9,720	

Job Name	Link To	Link From	Priority	Exist size (mm)	Upgrade size (mm)	Length (m)	Pipe Cost/m (\$)	No. of manholes	Cost per man hole	No of Outlets / Inlets	Cost per outlet / Inlet	No. of catch pits	Cost per Catch pit	Amount (\$)	Amount per job (\$)
Ecological Restoration Stage 1 (by boat ramp in reserve)														\$10,000	\$10,000
Ecological Restoration Stage 2														\$10,000	\$10,000
Ecological Restoration Stage 3														\$10,000	\$10,000
Giles Way Capex Works														\$50,000	\$50,000
Total														\$749,820	\$749,820
														Cost Covered by DIF's	\$134,968
														Cost Covered by current residents	\$614,852

Prioritising of Capital Works

Job	Job Cost	Existing Number of Properties	Cost per benefiting existing Property	Total Potential Number of Properties	Cost per maximum potential properties	Upgrade Priority (relating to COP Stds) High = 0.1 Med = 0.5 Low = 1	History of Problems (yes = 0.5 No = 1)	Community Issue (yes = 0.5 No = 1)	Industrial / Commercial or Residential (1 = Residential 0.5 = Ind/Com)	Factored Cost Per Property	Ranking
Ecological Restoration Stage 1 (by boat ramp in reserve)	\$10,000	6	\$1,667	6	\$1,667	0.1	0.5	0.5	1	\$42	1
Moana Drive	\$52,410	11	\$4,765	11	\$4,765	0.1	0.5	0.5	1	\$119	2
Tanners Point Road West (1) / Tanners Pt Rd (1)	\$70,800	7	\$10,114	7	\$10,114	0.1	0.5	0.5	1	\$253	3
Baigent Place	\$72,200	6	\$12,033	6	\$12,033	0.1	1	0.5	1	\$602	4
Tanners Point Road (2)	\$57,020	9	\$6,336	9	\$6,336	0.5	1	1	1	\$3,168	5
Tanners Point Road East Stage 1	\$54,030	7	\$7,719	7	\$7,719	0.5	1	1	1	\$3,859	6

Job	Job Cost	Existing Number of Properties	Cost per benefiting existing Property	Total Potential Number of Properties	Cost per maximum potential properties	Upgrade Priority (relating to COP Stds) High = 0.1 Med = 0.5 Low = 1	History of Problems (yes = 0.5 No = 1)	Community Issue (yes = 0.5 No = 1)	Industrial / Commercial or Residential (1 = Residential 0.5 = Ind/Com)	Factored Cost Per Property	Ranking
Tanners Point Road East Stage 2	\$71,120	9	\$7,902	9	\$7,902	0.5	1	1	1	\$3,951	7
Giles Way	\$50,000	6	\$8,333	6	\$8,333	1	1	0.5	1	\$4,167	8
Tanners Point Rd West (2)	\$65,190	6	\$10,865	6	\$10,865	1	0.5	1	1	\$5,433	9
Tanners Point Rd North (2)	\$68,690	10	\$6,869	10	\$6,869	1	1	1	1	\$6,869	10
Ecological Restoration Stage 2	\$10,000	1	\$10,000	1	\$10,000	1	1	1	1	\$10,000	11
Ecological Restoration Stage 3	\$10,000	1	\$10,000	1	\$10,000	1	1	1	1	\$10,000	12
Tanners Point Rd North (1)	\$53,040	5	\$10,608	5	\$10,608	1	1	1	1	\$10,608	13
Tanners Point Rd North (3)	\$103,980	9	\$11,553	9	\$11,553	1	1	1	1	\$11,553	14

Revised Construction Timeframe

Job	Job Cost	Construction Year
Ecological Restoration Stage 1 (by boat ramp in reserve)	\$10,000	2006/2007
Moana Drive	\$52,410	2006/2007
Tanners Point Road West (1) / Tanners Pt Rd (1)	\$70,800	2007/2008 2008/2009
Baigent Place	\$72,200	2009/2010
Tanners Point Road (2)	\$57,020	2010/2011
Tanners Point Road East Stage 1	\$54,030	2011/2012
Tanners Point Road East Stage 2	\$71,120	2012/2013
Giles Way ²	\$50,000	2013/2014
Tanners Point Rd West (2)	\$65,190	2014/2015
Tanners Point Rd North (2)	\$68,690	2015/2016
Ecological Restoration Stage 2	\$10,000	2015/2016
Ecological Restoration Stage 3	\$10,000	2015/2016
Tanners Point Rd North (1)	\$53,040	2016/2017
Tanners Point Rd North (3)	\$103,980	2017/2018

² The Giles Way project is not currently in the LTCCP but will be investigated for inclusion the next LTCCP review.

Maintenance Costs for the Additional Service

Job	Construction Year	Predicted Additional Maintenance Costs per annum	Cumulative Additional Maintenance Costs
Ecological Restoration Stage 1 (by boat ramp in reserve)	2006/2007	\$0.00	\$0.00
Moana Drive	2006/2007	\$0.00	\$0.00
Tanners Point Road West (1) / Tanners Pt Rd (1)	2007/2008 2008/2009	\$871.20	\$871.20
Baigent Place	2009/2010	\$0.00	\$871.20
Tanners Point Road (2)	2010/2011	\$0.00	\$871.20
Tanners Point Road East Stage 1	2011/2012	\$0.00	\$871.20
Tanners Point Road East Stage 2	2012/2013	\$0.00	\$871.20
Giles Way	2013/2014	\$0.00	\$871.20
Tanners Point Rd West (2)	2014/2015	\$0.00	\$871.20
Tanners Point Rd North (2)	2015/2016	\$0.00	\$871.20
Ecological Restoration Stage 2	2015/2016	\$0.00	\$871.20
Ecological Restoration Stage 3	2015/2016	\$0.00	\$871.20
Tanners Point Rd North (1)	2016/2017	\$0.00	\$871.20
Tanners Point Rd North (3)	2017/2018	\$0.00	\$871.20








The above costs are calculated based on the total Stormwater maintenance cost for the District and proportioned according to the value of stormwater assets at Tanners Point. Additional maintenance costs only apply to new assets not upgrading of the existing assets.

APPENDIX F

Map of Recommended Stormwater Upgrades



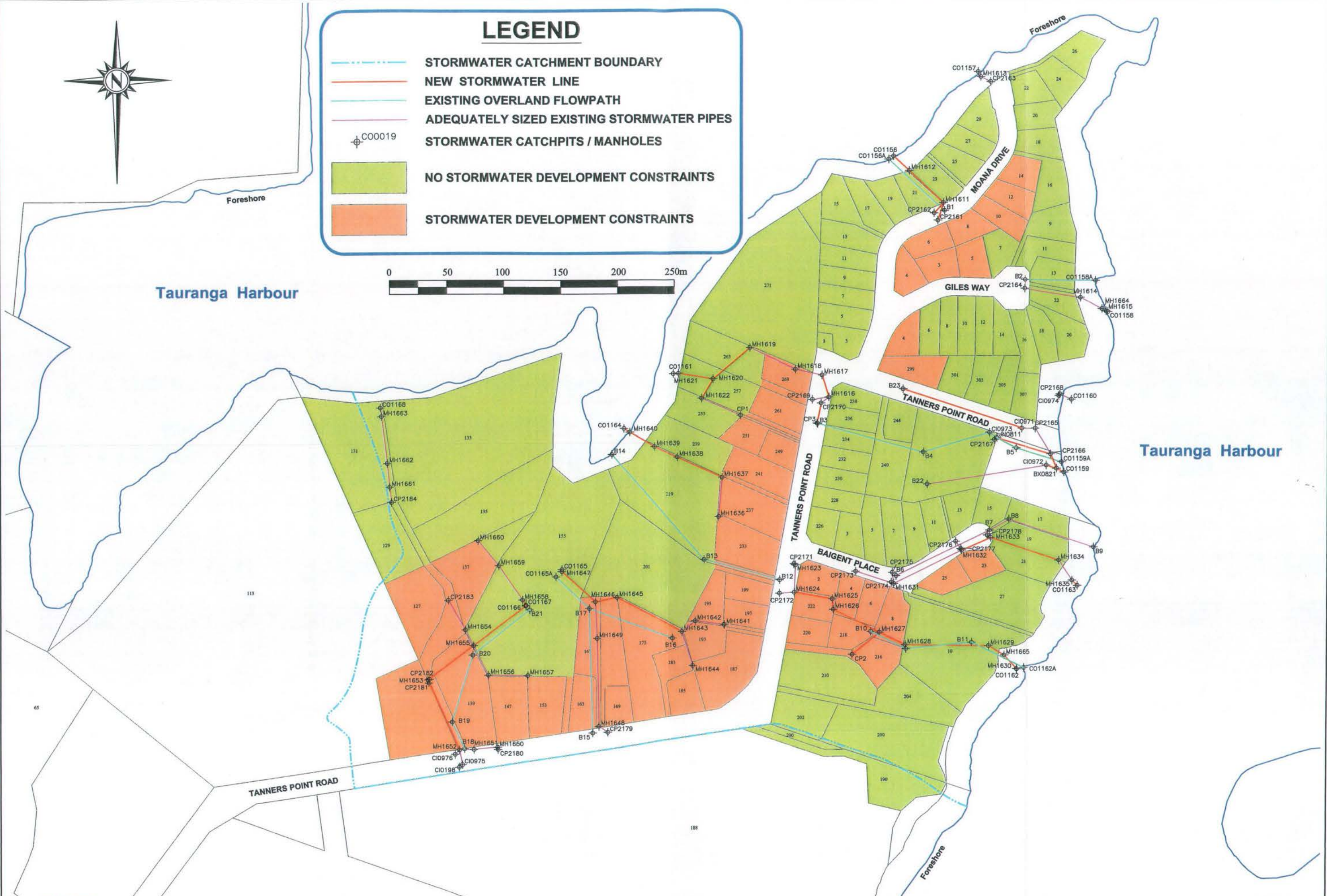
LEGEND

-  STORMWATER CATCHMENT BOUNDARY
-  NEW STORMWATER LINE
-  EXISTING OVERLAND FLOWPATH
-  ADEQUATELY SIZED EXISTING STORMWATER PIPES
-  STORMWATER CATCHPITS / MANHOLES
-  NO STORMWATER DEVELOPMENT CONSTRAINTS
-  STORMWATER DEVELOPMENT CONSTRAINTS



Tauranga Harbour

Tauranga Harbour



Version : 20 July - 2006

Scales: ~ 1:1500 (A1)
~ 1:3000 (A3)

Client  Western Bay of Plenty District Council

Project **TANNERS POINT CATCHMENT MANAGEMENT PLAN**

Sheet Title **STORMWATER MODEL & PROPOSED UPGRADES**

Job No. **43078**

Sheet No. **P04**
4 of 4 sheets

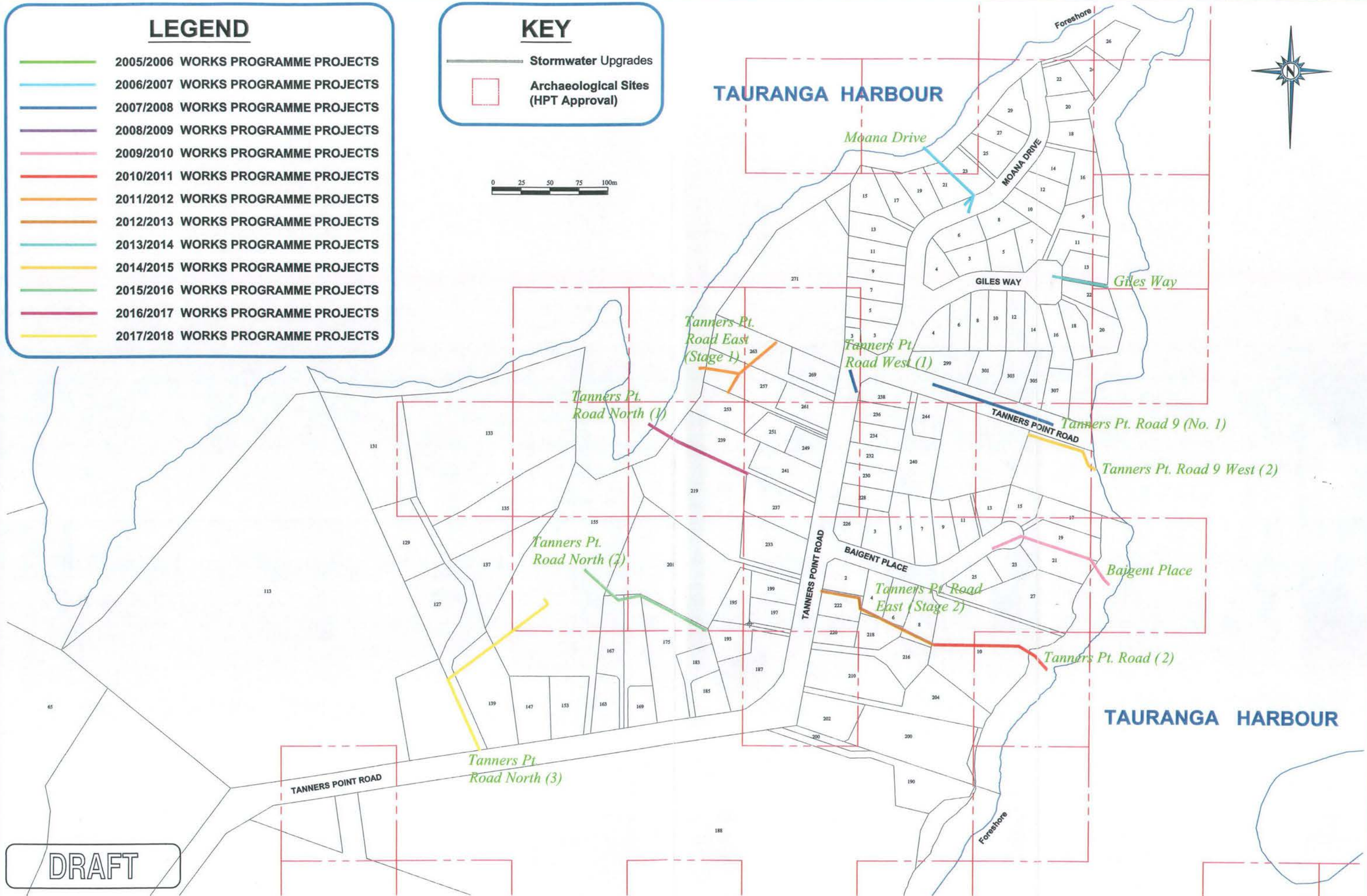
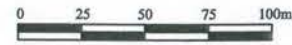
Duffin Watts & King Ltd
CONSULTING ENGINEERS

LEGEND

- 2005/2006 WORKS PROGRAMME PROJECTS
- 2006/2007 WORKS PROGRAMME PROJECTS
- 2007/2008 WORKS PROGRAMME PROJECTS
- 2008/2009 WORKS PROGRAMME PROJECTS
- 2009/2010 WORKS PROGRAMME PROJECTS
- 2010/2011 WORKS PROGRAMME PROJECTS
- 2011/2012 WORKS PROGRAMME PROJECTS
- 2012/2013 WORKS PROGRAMME PROJECTS
- 2013/2014 WORKS PROGRAMME PROJECTS
- 2014/2015 WORKS PROGRAMME PROJECTS
- 2015/2016 WORKS PROGRAMME PROJECTS
- 2016/2017 WORKS PROGRAMME PROJECTS
- 2017/2018 WORKS PROGRAMME PROJECTS

KEY

- Stormwater Upgrades
- Archaeological Sites (HPT Approval)



DRAFT

Version : 27 Nov - 2006



Project: **2005 - 2017 (STORMWATER) CAPITAL WORKS PROGRAMME**

Sheet Title: **OVERALL LAYOUT PLAN TANNERS POINT**

Job No. **43112.05.01.02**
 Sheet No. **L12** Revision **-** Ref. **Capital Works 3_1.09-12.dwg**

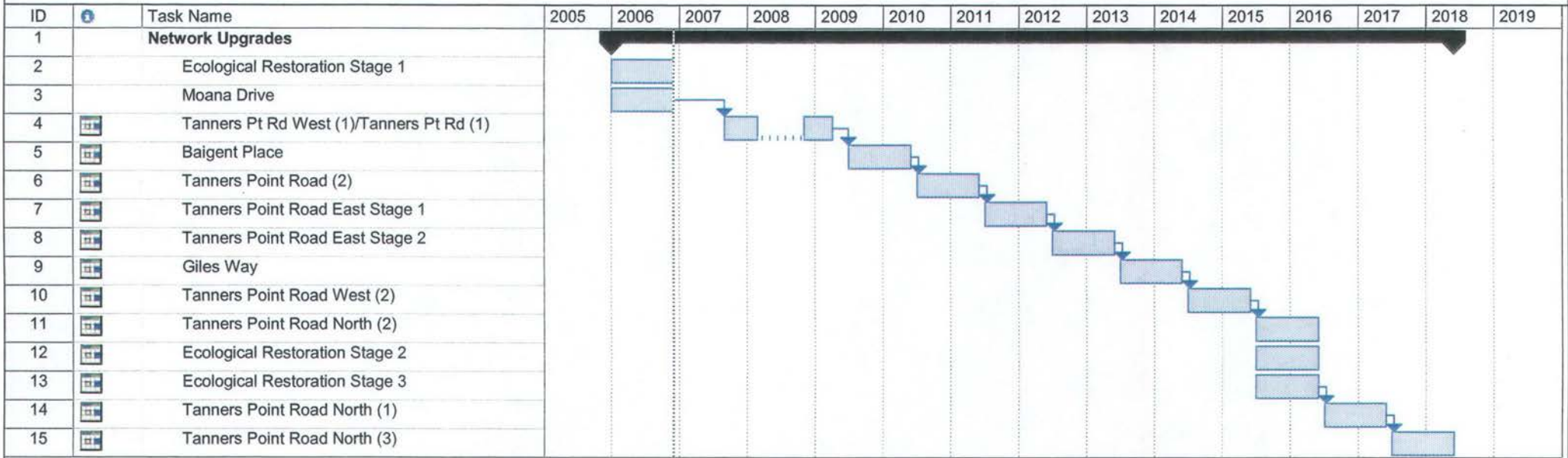
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Checked	D.R		03.06	Scales:	1:1500 (A1)
Approved	A.G.M		03.06		1:3000 (A3)

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APPENDIX G

Proposed Works Programme

Stormwater Works Programme Tanners Point



Project: Tanners point Date: Tue 28/11/06	Task		Milestone		External Tasks	
	Split		Summary		External Milestone	
	Progress		Project Summary		Deadline	

APPENDIX H

LTCCP Submission Summary

Summary from LTCCP Submissions

Submission from the Tanners Point Residents' and Ratepayers' Association notes that inadequacy of stormwater infrastructure at Tanners Point. In particular;

- i. The stormwater infrastructure at Tanners Point Pd, and submits that the work be brought forward on the work programme.
- ii. That there are no stormwater drains on either side of the downhill part of Tanners Point, from just above the Moana/Tanners Point intersection to the boat ramp. The present culverts on the left had side of the road are noted by the submitter to be inadequate. Submitted suggests that this work be brought forward to 2008 at the latest.
- iii. The attempts to alleviate the problems with the open drains in the Utilities Reserve are inadequate. Submitter suggests that a new subproject to pipe the open drains and to drain the grassed area with nova flow drains be included in the early part of the Long Term Plan 2006/2016.
- iv. That there is regular water overflow from the lower side of 21 Moana Drive which needs rectification.
- v. Stormwater drainage work is required to prevent the flooding of residences at Giles Way to avoid washout of the walking track.
- vi. Heavy rain deposits gravel onto the SH2 end of Tanners Point Rd outside number 16. This affects the safety of this corner. Submitted suggests that open drains will relieve this problem.