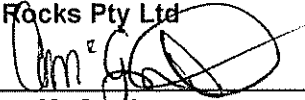




Wood & Grieve
ENGINEERS

**LOC 413 SMITH'S BEACH DEVELOPMENT
WASTEWATER COLLECTION
AND EFFLUENT DISPOSAL REPORT**

To: Canal Rocks Pty Ltd
From: 
Anthony McGrath
Wood & Grieve ENGINEERS
Date: 20 May 2005
Project No: 11161C



CONTENTS

EXECUTIVE SUMMARY	3
1. GENERAL	4
2. INVESTIGATION OF ALTERNATIVE OPTIONS FOR WASTEWATER COLLECTION & EFFLUENT	6
2.1 GENERAL	6
2.2 SUMMARY OF STUDY AND REPORT	6
2.3 WATER CORPORATION REVIEW	9
3. PRELIMINARY PIPELINE ROUTE DESIGN	10
3.1 GENERAL	10
3.2 SUMMARY OF RESULTS	10
3.3 OTHER ISSUES	12
3.3.1 Impact on Adjoining Lot Owners	12
3.3.2 Easements Required and Maintenance Access	13
3.3.3 Future Development Implications	13
4. APPROVAL PROCESS	14
4.1 GENERAL	14
4.2 MAIN ROADS	14
4.3 SHIRE OF BUSSELTON	14
APPENDIX 1: BOWMAN BISHAW GORHAM REPORT	



EXECUTIVE SUMMARY

This report summarises the investigations, studies and previous reports carried out regarding the provision of a wastewater collection and effluent disposal system for development on Loc 413 Smith's Beach.

The information reports and studies have been produced in line with the agreed study methodology for this aspect of the development proposal.

A Department of Health (WA) requirement of subdivisional development would be to connect to a reticulated water and sewerage system operated by service providers licensed by the Office of Water Regulation. The license for this area is held by the Water Corporation.

Water supply will come via a connection from the existing Water Corporation reticulation supply on Caves Road at the Yallingup turn-off. Wastewater will be via a reticulated deep sewer within the subdivision down to a pump station at the low point of the development. The wastewater will then be pumped via a pressure main to the Water Corporation's Wastewater Treatment Plant at Anniebrook, Dunsborough.

The route for the water and sewer pressure mains will be within road reserves, adjacent to the road pavement, to minimise loss and disturbance of vegetation.

The proposed route is also planned to allow for potential sharing of infrastructure with the Hilton development. This fits well with the sustainability philosophy being applied to development at Smiths Beach.

Key initiatives of the 2003 State Water Strategy (SWS) adopted by WA include reducing water consumption and increasing water reuse. The findings of the attached 1998 Bowman Bishaw Gorham study of options have been assessed in terms of the SWS, and it was found that the conclusions align very well with the intent of the SWS.



1. GENERAL

This report ties together the investigations, studies and previous reports carried out in relation to providing a wastewater collection and effluent disposal system for development on Loc 413 Smith's Beach.

The information, reports and studies have been produced in line with the agreed study methodology for this aspect of the development proposal.

For the purpose of calculating flows and sizing various aspects of the effluent disposal system, the upper limit development proposal was used. That is, the number of development units was based on the original Development Guide Plan. It is recognised that the Development Guide Plan has since changed, and is likely to continue to evolve as a result of community and stake holder input. However, from an effluent disposal system and environmental issues point-of-view, the conclusions reached are likely to be valid for different development scenarios as long as subdivision (into separate lots) takes place as part of the development and that a minimum of 100 units are developed. The current plan would accommodate fewer people but still meets the above criteria and thus the conclusions reached herein remain valid.

Note that the Health Department of WA has advised that it would be a requirement of subdivisional development to connect to a reticulated water and sewerage system operated by service providers licensed by the Office of Water Regulation. In late 2003, the Water Corporation was granted the license to supply water and wastewater collection services to Smiths Beach, and therefore these services will be provided by the Water Corporation. A copy of the sewer and water licences are included as Plan Numbers OWR-OA-203(A) and OWR-OA-085/1(C).

From a water supply view-point, a connection into the existing reticulation supply may be made to the Water Corporation system on Caves Road at the Yallingup turn-off. This is the nearest water supply. It is not possible to develop a separate stand-alone system for Loc 413 as no local water resources exist sufficient for development.

Connection to the Yallingup supply water main will require the construction of a pipeline from Yallingup turn-off to Loc 413 within existing road reserves.



Wood & Grieve
ENGINEERS

Wastewater will be pumped from the site via a pressure main to the Water Corporation's Wastewater Treatment Plant at Anniebrook, Dunsborough. Reticulation within the development will be by deep sewer to a pump station at the lowest point.

To minimise loss and disturbance of vegetation, the water and sewer pressure main route will be within road reserves, and adjacent to road pavements.

In 2003, WA adopted the State Water Strategy (SWS). Key initiatives include reducing water consumption and increasing water reuse. The findings of the attached 1998 Bowman Bishaw Gorham study of options have been assessed in terms of the SWS, and it was found that the conclusions align very well with the intent of the SWS.



2. INVESTIGATION OF ALTERNATIVE OPTIONS FOR WASTEWATER COLLECTION & EFFLUENT

2.1 General

Although the Water Corporation has now been granted the license to provide sewer services to the Smiths Beach area, in the initial stages of this proposed development, there was no service provider for the region. Thus, various possibilities were assessed in terms of economic and environmental suitability. The conclusions reached by this assessment align well with the provision of services by the Water Corporation. The assessment process is described herein.

Included in its entirety at Appendix 1 is the report prepared by Bowman Bishaw Gorham in November 1998. This report presents an evaluation of all reasonably viable systems for wastewater collection and effluent disposal. The report was based on the expected population indicated by our assumed Development Guide Plan at that date. The population expected under a current plan is lower than originally assumed, yet the conclusions of the report remain valid.

Since the completion of this study, Western Australia has adopted the State Water Strategy (SWS) which aims to reduce water consumption and increase reuse. The findings of these investigations align well with the key initiatives of the SWS.

2.2 Summary of Study and Report

The Canal Rocks Unit Trust intends to implement a tourist and residential development at Sussex Location 413, Smiths Beach. No sewer facility is currently available to the area.

The study recognises the environmental values of the region, together with strategic planning necessary for orderly and sustainable development.

The report at Appendix 1 focused on the identification and assessment of effluent treatment and disposal options for the proposed Smiths Beach development from both technical and environmental perspectives. The report was based on the requirements of a consultant's brief issued for the study, defined in consultation with the Water Corporation's Bunbury Office, and concluded the following:



- Connection of the development site to the Water Corporation's wastewater proposed treatment plant at Anniebrook in Dunsborough was considered feasible and achievable.
- The approach to strategic planning for sewerage treatment and disposal has now shifted from the historical convention of primary or secondary treatment followed by ocean or river outfalls, or infiltration / evaporation, towards approaches which can contain the treated effluent on land and can achieve the beneficial re-use of the final effluent. In Western Australia, the recent trend in treated effluent disposal is to re-use treated effluent in plantation forestry, for irrigation of recreational playing fields, or in horticulture
- The establishment of a dedicated effluent treatment and disposal facility for the existing and proposed development at Smiths Beach was considered feasible and achievable, subject to more detailed site assessment and design. Modeling estimated that a woodlot plantation, winter storage pond and appropriate buffer would require a land area of approximately 45ha. Irrigated viticulture would require a land area of approximately 100ha.
- Mapped data describing the following factors was assembled to identify potential treatment and disposal sites within an 8km radius of Smiths Beach:
 - Large areas previously cleared of native vegetation;
 - Land capability and soil types based on the Department of Agriculture regional land capability study;
 - Land use planning policy;
 - Existing land use including roads and road reserves; and
 - General drainage and topography
- A suite of 21 potential sites was evaluated to identify areas where a woodlot or vineyard of suitable size areas present or could be established for the purpose of disposing treated effluent.



- Land north of Wildwood Road was precluded for establishment of the disposal facility due to designation of rural-residential living in the Leeuwin-Naturaliste Ridge Statement of Planning Policy (SPP).
- A number of sites with land area and capability suitable for the establishment of a woodlot plantation or area of vines were identified. A land parcel totaling 360ha located close to Smiths Beach immediately south of Canal Rocks Road appeared the most suitable of those investigated, and may be compatible with the objectives of the SPP.
- Potential sites located on Wildwood and Abbeys Farm Road may present environmental, social and economic difficulty regarding the installation of a pipeline within the road reserve. Difficulty was likely to increase with distance from the Smiths Beach site.
- Assuming appropriate design and achievement of an acceptable buffer, the installation of a treatment plant and infiltration basins at the Vidler Road quarry appeared feasible, subject to more detailed hydrogeological investigation.
- On-site effluent disposal through septic tank and leach drain systems, ocean disposal, and disposal to surface streams were discounted as a feasible option due to environmental, social and engineering constraints.
- An economic analysis indicated that two options, the establishment of a high quality treatment plant with stream discharge, and connection to the Dunsborough wastewater treatment plant, had similar cost implications and were the most economic of the options considered.
- Based on the combined economic and environmental factors considered in this study, connection to the Dunsborough sewerage system was the favoured option.

The issue of the licence to the Water Corporation for service provision therefore is a good environmental and economic outcome for the site. In addition, this solution enacts positions now supported by the WA State Water Strategy. It also provides the most sustainable outcome, particularly given the potential for the sharing of infrastructure.



The SWS focuses on reducing water consumption and on increasing water reuse.
The preferred option agrees well with the intent of the SMS.

2.3 Water Corporation Review

A review of the investigation of the various wastewater collection and effluent disposal options was undertaken by the Water Corporation's Infrastructure Planning Branch.

Their report is commercially sensitive and confidential and as such, we are unable to publish a copy of their report

Their study of the available treatment options and conclusions did concur with the Bowman Bishaw Gorham report, in that their preferred option was to pump untreated wastewater to the Dunsborough scheme.

The Water Corporation have since applied for and been granted the licence to provide water and sewer services to the Smiths Beach area

The Water Corporation currently favours a sewer rising main route which discharges directly to their Dunsborough Wastewater Treatment Plant (WWTP) in Anniebrook. Although discharging to existing infrastructure in Dunsborough would be closer, a discharge directly to the WWTP has the following advantages:

- No potential for odour issues at discharge point
- Likelihood of sharing of infrastructure.

Any further queries should be directed to the Water Corporation – Infrastructure Planning Branch.



3. PRELIMINARY PIPELINE ROUTE DESIGN

3.1 General

Having accepted that the best solution is to connect to the Dunsborough scheme, the following is a description of the various sections of the preferred pipeline route.

3.2 Summary of Results

The preferred pipeline route is shown on the following plans WGE 11161C-RM1 (A) and 11161C-RM2 (A). A description of the route is detailed under the various sections

Smith's Beach Road

This section of pipeline would be located within the existing road reserve. The mains would be located on such an alignment to prevent existing roadside vegetation loss.

Unconstructed Road Reserve to Canal Rocks Road Intersection.

This section of pipeline would be located within unconstructed road reserves. The mains would be located on such an alignment to minimise existing vegetation loss, however, some vegetation loss would be expected.

Canal Rocks Road to Caves Road.

This section of pipeline would be located along a selected alignment to minimise existing roadside vegetation loss (ie along the edge of the existing pavement)

Caves Road to Gunyulgup Valley Drive.

A short section of main is required to be located within Caves Road (~200m long) or with permission in an easement within existing private property. This section crosses Gunyulgup Creek. The mains would be located on such an alignment to minimise existing roadside vegetation loss.



**Gunyulgup Valley Drive , Kangaroo Parade and Marrinup Drive to
Commonage Road Intersection.**

The main would be located within existing road reserves as designated and on alignments to prevent or minimise vegetation loss. That is, the alignment would be proposed to follow along the edge of the existing pavement.

Commonage Road, Hayes Road and Vasse-Yallingup Road.

As part of the proposed Hilton Resort development, it is understood that the current plan is to construct a gravity sewer along Commonage Road, Hayes Road and Vasse-Yallingup Road to the Water Corporation's Wastewater Treatment Plant at Anniebrook, Dunsborough. Under this arrangement, wastewater from the Smiths Beach Development would discharge into this sewer at Commonage Road.

Should the gravity sewer not be constructed as part of the Hilton Resort development, then the pressure main would need to continue along this same route to the Treatment Plant.

Along Commonage Road and Vasse-Yallingup Road, the route alignment will be selected to avoid vegetation damage.

Along Hayes Road, the alignment selected will avoid vegetation damage whilst also minimising disturbance of existing servicing infrastructure.

The preferred pipeline route has been chosen to ensure that vegetation loss is at a minimum and that other issues of Authority requirements and constructability are addressed. This route also ensures that social and construction impacts are minimised.



3.3 Other Issues

Below we have discussed other issues as required by the particular methodologies.

3.3.1 Impact on Adjoining Lot Owners

The preferred route for the pipeline locates these service mains within existing road reserves, with the exception of a short section along Caves Road which may be located within a new easement with the consent of the landowners.

The impact of the installation of the pipeline on adjoining lot owners would basically occur only at the time of construction and would include the following:

- Excavation of typically 1m deep trench for the installation of mains.
- Minor disruption due to construction equipment with associated noise and other construction effects.
- Possible temporary different access measures needed to be taken when construction is being undertaken near crossovers or access points.

In order to minimise any impacts to adjacent lot owners, the following items would be implemented as part of the specified construction conditions:

- Specified working hours to prevent early start, late finish or Sunday works.
- Adherence to the DEP dust control guidelines
- Specific conditions to ensure the contractor does not damage adjacent properties and is responsible for any remedial works
- Maintenance of proper insurance policies.

These various conditions would ensure a minimum impact of the construction works on adjoining lot owners.



3.3.2 Easements Required and Maintenance Access

The preferred pipeline route would have virtually all of the mains located within existing road reserves

The only exception is a short section (200m long) which may be in private land with an easement, subject to landowner agreement.

Hence, maintenance access along the mains would be provided easily and governed by a possible new easement and from existing road reserves.

3.3.3 Future Development Implications

The provision of sewerage infrastructure would be designed to service the final approved Development Guide Plan. No excess capacity in the on-site sewer pumping station will be provided for future development at Smiths Beach.



4. APPROVAL PROCESS

4.1 General

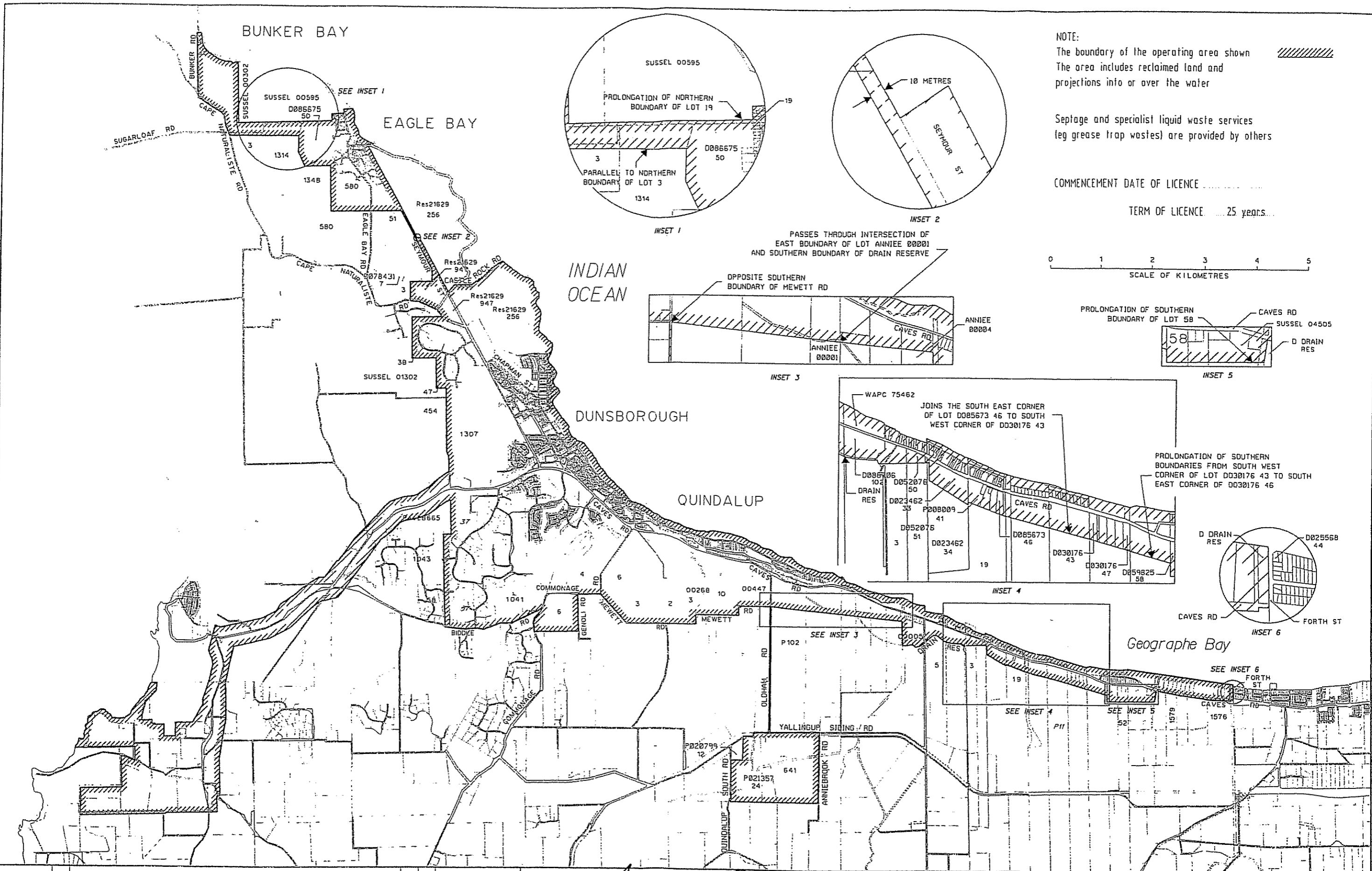
Further to the studies carried out to date, we have had a number of responses from various authorities. These responses are detailed below:

4.2 Main Roads

In the area along Caves Road, Main Roads do not support the location of the sewer rising main within the road reserve. The preferred route reflects their preference.

4.3 Shire of Busselton

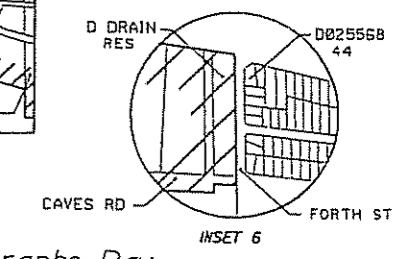
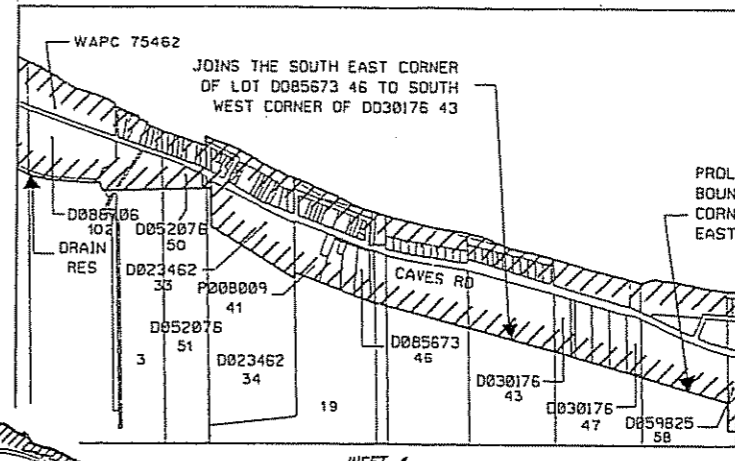
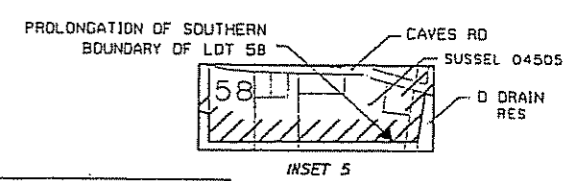
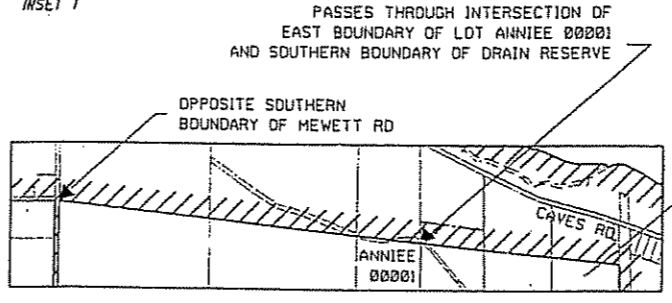
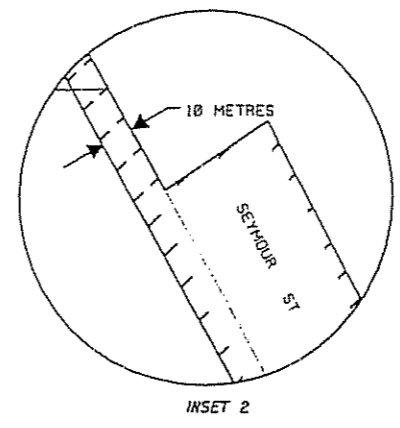
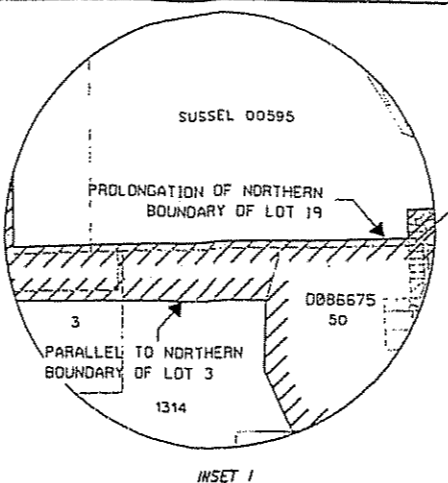
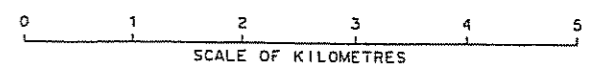
As part of the normal approval process, the Shire of Busselton Technical Officers will review the preferred rising main route. It is known that they are keen to ensure maximum retention of roadside vegetation, which is also the proponent's preference. Hence, actual design of the alignments will take this into consideration.



NOTE:
 The boundary of the operating area shown
 The area includes reclaimed land and projections into or over the water

Septage and specialist liquid waste services (eg grease trap wastes) are provided by others

COMMENCEMENT DATE OF LICENCE
 TERM OF LICENCE 25 years.....



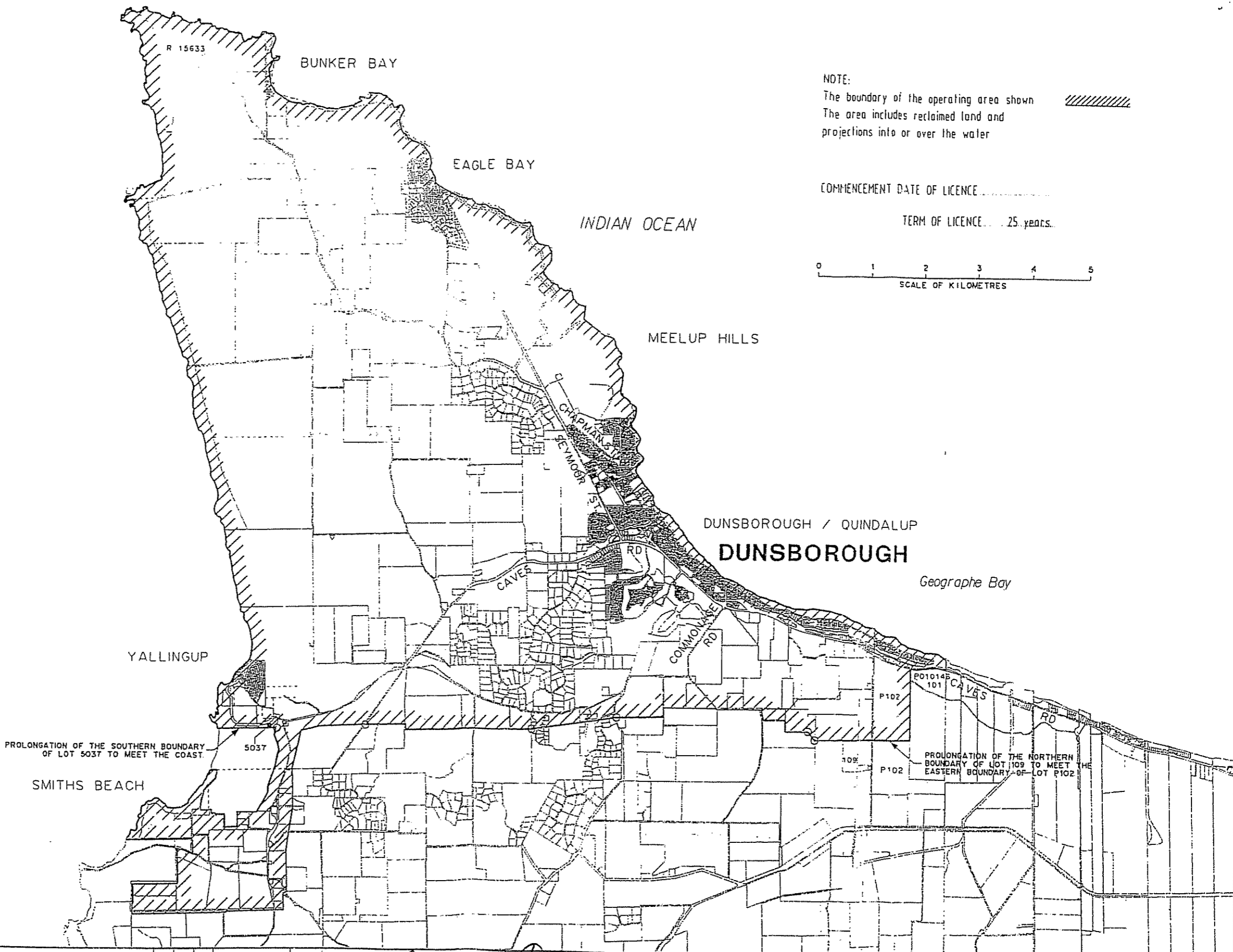
DATE	No	DESCRIPTION	DRN	CHK
25-08-2003	B	AMENDED OPERATING AREA TO INCLUDE SMITHS BEACH	DO	MT
09-07-1999	A	REDUCED OPERATING AREA	SM	JH
29-03-1999		NEW DRAWING SHOWING AMENDED OPERATING AREA	ST	JH
08-01-1986		ORIGINAL ISSUE - DRG OWR-0A-058/3A	JA	WJP



APPROVED:
 COORDINATOR OF WATER SERVICES
 DATE: 13.11.03

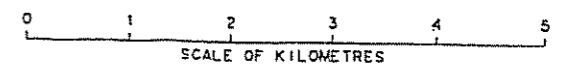
WATER SERVICES CO-ORDINATION ACT 1995
 DUNSBOROUGH OPERATING AREA
 SEWERAGE SERVICES
 LICENSEE: WATER CORPORATION

DRAWN S.MASTERS	CHECKED J.HARRIS	PLAN NO. OWR-0A-203	ISSUE B	ORIG SIZE A3
FILE No.	DATE 9 JULY 1999			



NOTE:
 The boundary of the operating area shown The area includes reclaimed land and projections into or over the water

COMMENCEMENT DATE OF LICENCE
 TERM OF LICENCE... 25 years.



DATE	No	DESCRIPTION	DRN	CHK
29-08-2003	C	AMENDED OPERATING AREA TO INCLUDE SMITHS BEACH	DO	MT
13-05-2003	B	RESUBMITTED FOR SOLE PROVIDER STATUS	SM	MT
19-03-1996	A	ORIGINAL ISSUE - DRG OWR-OA-085/1	JA	WJP YG

APPROVED :
 COORDINATOR OF WATER SERVICES
 DATE : 13.11.03

WATER SERVICES CO-ORDINATION ACT 1995
 DUNSBOROUGH OPERATING AREA
 POTABLE WATER SUPPLY SERVICES
 LICENSEE : WATER CORPORATION

DRAWN S.MASTERS	CHECKED J.WINTERBOURNE	PLAN NO. OWR-OA-085/1	ISSUE C	ORIG SIZE A3
FILE No.	DATE 26 MARCH 1999			