

MURRAY DOWNS DEVELOPMENT
AND
STRATEGY PLAN

Prepared for

KIDMAN REID AND CO

By

HASSELL PLANNING CONSULTANTS
PTY LTD

In Association With

Hosking Oborn and Partners Pty Ltd
Land Systems Pty Ltd
Hassell Pty Ltd Architects
David Crew, Archaeological Consultant

April 1987

CONTENTS

1	INTRODUCTION
2	REPORT OUTLINE
3	SITE ASSESSMENT
3.1	SITE DEFINITION
3.2	TOPOGRAPHY
3.3	VIEWS
3.4	VEGETATION
3.4.1	Existing Vegetation
3.4.2	Constraints
3.5	CLIMATE
3.6	SOIL ANALYSIS
3.6.1	Background
3.6.2	Soil Types
3.6.3	Soil Tests
3.6.4	Soil Summary
3.6.5	Recommendations
3.6.6	Golf Course Constraints
3.7	HYDROLOGY, GROUND WATER AND FLOOD LEVELS
3.7.1	Hydrology
3.7.2	Ground Water
3.7.3	Flood Levels
3.8	LANDSCAPE ANALYSIS
3.9	COMMUNITY FACILITIES
3.9.1	Education Facilities
3.9.2	Shopping and Community Centre
3.10	ARCHAEOLOGICAL SURVEY
3.11	EXISTING SERVICES
4	DEMOGRAPHIC AND MARKET STUDIES
4.1	DEMOGRAPHIC CHARACTERISTICS AND TRENDS
4.1.1	Existing Population and Growth
4.1.2	Income
4.1.3	Age Structure

of ground water for salinity testing will be taken after two weeks, and then once every four weeks unless reasonable rainfall has been recorded in which case a period of 7 days should be left prior to salinity testing. Testing of saline water could be carried out locally in Swan Hill by the Department of Agriculture or sent to Adelaide for testing. It is also recommended that rainfall measurements be kept (if not already being done) for the full duration in order that correlations can be made between rainfall and ground water levels.

3.7.3 Flood Levels

Historical flood level data has been obtained from the Rural Water Commission of Victoria (Ref. "Murrumbidgee River to Torrumbarry Weir", Flood Profiles, Drawing No. 136 641).

Peak water levels to Australian Height Datum are set out below in Table 5.

The site of the proposed development is in a reach located approximately 3-6 km upstream of the confluence of the Little Murray River at Swan Hill.

The surface water slope upstream of the confluence has been computed as 0.0941 metres/km for the 1975 flood and the corresponding estimated levels adjacent to Murray Downs are :

. 3km upstream of confluence $67.74 + 0.0941 \times 3 = 68.02$

. 6km upstream of confluence $67.74 + 0.0941 \times 6 = 68.30$

In relation to flood levels it should be noted that Section 37B of the Drainage of Land Act, 1975 (Victoria) prescribes the 1% probability flood as the limiting criterion for flood plain management purpose (this 1% probability flood has an average recurrence interval of 100 years).

Drawing No. 136 641 provides the following guidelines for the % probability flood level in the river reach under consideration.

"Although no detailed investigation has been undertaken in this region, it is expected that the 1% probability flood would be enveloped between 1975 flood levels and the 1975 levels + 0.25m."

Thus an upper limit of flood levels at the upstream extremity of the site would be :

$$68.3 + 0.25 = 68.55\text{m (AHD)}$$

TABLE 5

LOCATION			1956 FLOOD	1975 FLOOD	SLOPE m/km
RIVER KMS	L	SITE	h		
1409.0		Swan Hill Gauging Station	67.57	67.70	0.0308
	1.3		0.05	0.04	
1410.3		Confluence - Little Murray River	67.62	67.74	0.0941
	20.2		1.83	1.90	
1430.5		Pental Island	69.45	69.64	0.085
	32.0		2.67	2.72	
1462.5		Little Murray River Confluence	72.12	72.36	

A survey check on the top of the river levee has been undertaken and levels are as follows (proceeding upstream) :

1	68.58
2	68.55
3	68.98
4	68.73

The locations of these levels are shown on Plan 8.

Thus it is clear that the existing levees are sufficient to protect the site from a 1% probability flood, albeit with very little "free board". (It should be noted that the 1975 flood + 0.25m is an "upper limit envelope" on the 1% flood).

Local experience during the major floods referred to above indicates that the land under consideration has never flooded.

As a conservative measure, it is proposed that the levees protecting the south-east portion of the site be raised to a level of 69.00m AHD to provide adequate "free board" over the 1% flood.

Certain parts of the proposed residential areas are below level 68.5 (refer to Plan 9). These are discussed below (refer to Plan 13 for identification of residential areas) :

. **Part Areas B, C, and E**

These areas could only be flooded by overbank flow near the existing lodges and shearing shed. However, much of the land between Area E and the river is above 68.5 metres, while the main access road along the southern boundary of these areas is and will be at a level in excess of 69.0 metres, therefore protecting these areas from the south.

. **Part Areas A and D**

The southern sections of these areas are below 69.0 metres AHD but are protected by the existing levee banks along the river which are generally at or above 69.0 metres AHD. These areas will be protected by ensuring that all levees to their south are raised to 69.0 metres.

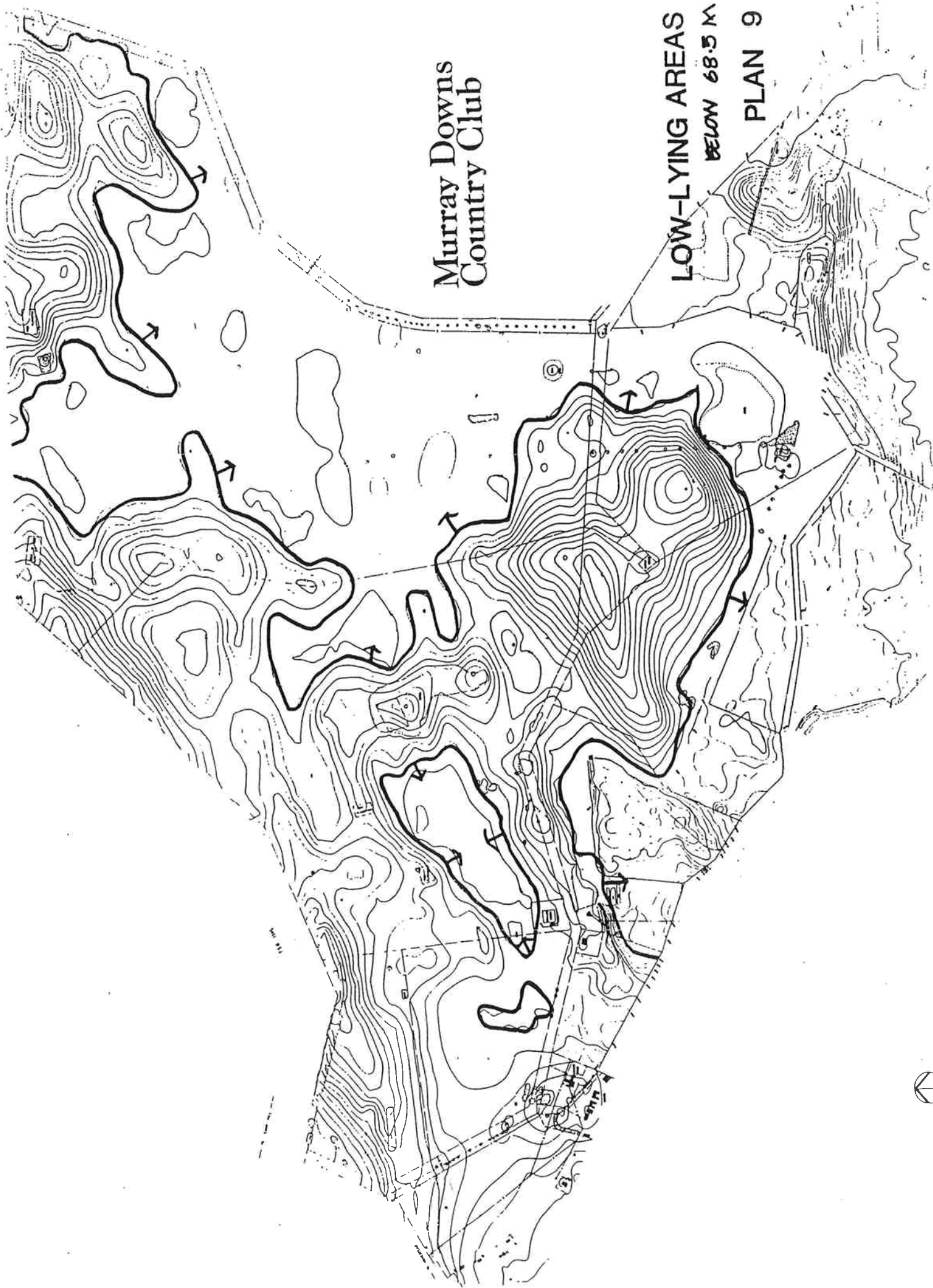
. **Part Areas F and G**

Because of the protection afforded by the river levees, these areas could only be affected by backflow along the flood plain to the east.

It is proposed that the levees be formed to the required design standards along the line of the existing earth irrigation channel to the east of Areas F and G to a level of 69.0 metres.

Murray Downs
Country Club

LOW-LYING AREAS
BELOW 68.5 M
PLAN 9



In the future, the low lying area to the south-east of the site may be developed, in which case a further extension of the channel/levee system will be required to protect the area from flood plain backflow from upstream.

Construction of infrastructure and subdivision services would be relatively more expensive in this area because of the probable need for dewatering during trench construction and the need for a stormwater retention basin and pumping system.

3.8 LANDSCAPE ANALYSIS

The landscape is dominated by a general lack of topographic relief and subsequently long distance views predominate.

The pastoral land uses have highlighted this by removing most stands of substantial vegetation leaving only scattered large trees or uniformly planted introduced species.

The major factors of landscape interest include :

- . dense fringing vegetation along the Murray River;
- . individual large mature black box trees;
- . several small dams, and
- . two moderately elevated hills offering views over the site to the north and south.

The range of landscape experiences available is very limited largely due to :

- . very few short or middle distance views of interest or variety, and
- . the general homogeneity of the vegetative cover with only pasture grass crops and very few scattered mature trees.

3.9 COMMUNITY FACILITIES

3.9.1 Education Facilities

Discussions have taken place with Mr Gribble, Assistant Regional Director of the Education Department of Victoria. Currently, in Swan Hill, there are two state primary schools and one catholic primary school. Current enrolments are 430 students at Swan Hill North and 400 at Swan Hill Primary School, although Swan Hill Primary (which is presently under construction in a new location) has the potential for 500 enrolments. Both enrolment figures could be increased through the use of temporary classrooms. The Education Department of Victoria expects that in the short to medium term all students living at Murray Downs could be catered for in the three primary schools at Swan Hill, although if in the longer term there was a total enrolment of several hundred students, there would be good reasons for establishing a new