Ascot Waters — Proposal to dredge two channels to connect an artificial wetland with the Swan River

Western Australian Planning Commission and the
City of Belmont

Report and recommendations
of the Environmental Protection Authority

Environmental Protection Authority
Perth, Western Australia
Bulletin 797
December 1995

GOV

THE PURPOSE OF THIS REPORT

This report contains the Environmental Protection Authority's environmental assessment and recommendations to the Minister for the Environment on the environmental acceptability of the proposal.

Immediately following the release of the report there is a 14-day period when anyone may appeal to the Minister against the Environmental Protection Authority's report.

After the appeal period, and determination of any appeals, the Minister consults with the other relevant ministers and agencies and then issues his decision about whether the proposal may or may not proceed. The Minister also announces the legally binding environmental conditions which might apply to any approval.

APPEALS

If you disagree with any of the contents of the assessment report or recommendations you may appeal in writing to the Minister for the Environment outlining the environmental reasons for your concern and enclosing the appeal fee of $10.

It is important that you clearly indicate the part of the report you disagree with and the reasons for your concern so that the grounds of your appeal can be properly considered by the Minister for the Environment.

ADDRESS

Hon Minister for the Environment

12th Floor, Dumas House

2 Havelock Street

WEST PERTH WA 6005

CLOSING DATE

Your appeal (with the $10 fee) must reach the Minister's office no later than 5.00 pm on 22 December 1995.

Environmental Impact Assessment (EIA)

Process Timelines in weeks

Date	Timeline commences from receipt of full details of proposal by proponent	Time (weeks)
10/7/95	Proponent Document Released for Public Comment	
4/9/95	Public Comment Period Closed	8
15/9/95	Issues Raised During Public Comment Period Summarised by EPA and Forwarded to the Proponent	2
27/9/95	Proponent response to the issues raised received	2
6/12/95	EPA reported to the Minister for the Environment	10

ISBN. 0 7309 5756 X
ISSN. 1030 - 0120
Assessment No.941

Contents

Contents (cont'd)

Tables

Figures

Appendices

Summary

This report and recommendations provides the Environmental Protection Authority's advice to the Minister for the Environment on the environmental acceptability of the proposal to dredge two channels to connect a recently modified artificial wetland with the Swan River (refer to Figure 1). The proposed channels and existing wetlands are located to the west of Garrett Road Bridge in the City of Belmont. It is intended to integrate the channel with the Ascot Waters residential development.

The dredging of the channels constitutes the final stage of the Ascot Waters development (refer to Figure 2). The Environmental Protection Authority has given advice on earlier stages of the project including the Metropolitan Region Scheme amendment to rezone the land to 'Urban' and the modification and recontouring of the existing artificial wetlands (refer to Appendix 1a and 1b).

The proponents are the Western Australian Planning Commission and the City of Belmont. The Ascot Waters project is being partly funded by the Commonwealth Government under the Building Better Cities Programme and a consortium of developers.

The Environmental Protection Authority identified the main environmental issues requiring detailed consideration as:

Biophysical

- acceptability of dredging on the Swan River;
- impact on System 6 - loss of habitat;

Pollution

- management and monitoring of leachate from tip site;
- management of Central Belmont Main Drain;
- management of waterways and water quality;
- contingency plans required in the event that water quality in the channel declines;

Social Surroundings

- mosquitoes.

The proponent has made a number of commitments which if successfully implemented adequately address these issues. The matter of on-going management of the channel following development of the land and transfer of the channel to the Crown is an issue requiring a specific Environmental Protection Authority recommendation.

The Ascot Waters proposal is considered to be a net benefit to the river environment on the basis that it:

- provides replacement wetlands well in excess of the area disturbed by dredging;
- will improve the quality of water entering the Swan River from the Central Belmont Main Drain; and
- will upgrade an area of degraded regional open space for public use.

Conclusion

The Environmental Protection Authority has evaluated the proposal to dredge two channels to connect an artificial wetland with the Swan River and has concluded that the project is environmentally acceptable, subject to the proponent's commitments and an Environmental Protection Authority recommendation.

Recommendation No.	Summary of recommendations
1.	The proposal to dredge two channels to connect an artificial wetland with the Swan River at Ascot Waters is environmentally acceptable and the Environmental Protection Authority recommends that it could proceed subject to the successful implementation of the proponent's commitments and recommendation 2.
2.	At least 6 months prior to the date of handover of the management responsibility of the waterway to the State, the proponent shall submit a report to the Environmental Protection Authority which addresses the following environmental performance measurements: • water quality and channel flushing characteristics; and • a strategy for the future management of the channel.

1. Introduction and background

1.1 Purpose of this report

This report provides the Environmental Protection Authority's advice and recommendations to the Minister for the Environment on the environmental acceptability of the proposal to dredge two channels to connect a recently modified wetland with the Swan River (refer to Figure 1) at Ascot Waters.

1.2 Background

The Public Environmental Review (PER) addresses a proposal to dredge two channels to connect a artificial waterbody to the Swan River. It is intended to integrate the resulting channel with the proposed Ascot Waters residential development (refer Figure 2).

The are a number of environmental impacts which may result from the proposal, that are of sufficient concern to the Environmental Protection Authority for it to require a formal assessment. These include the impacts of dredging on the river environment, water quality, the former Belmont tip site and System 6 areas.

The 97 hectare site is currently vacant and has frontage to the southern foreshore of the Swan River to the west of Garrett Road Bridge (refer Figure 3). Portions of the land have previously been used for sanitary landfill and clay excavation.

The proponents are the Western Australian Planning Commission and the City of Belmont.

The Ascot Waters project is being partly funded by the Commonwealth Government under the Building Better Cities Programme and a consortium of developers.

The project has been assessed by the Environmental Protection Authority in the following stages:

- Stage One involved assessment of the residential component of the project located to the east of the old tip site.

  The Environmental Protection Authority informally assessed this stage of development in October 1993 . A copy of this advice is provided in Appendix 1a and 1b.

- Stage Two involved modifying the existing artificial wetlands.

  The EPA did not assess Stage Two on the basis that it was subject to the Swan River Trust's approval conditions. The site works undertaken during 1995 were part of Stages One and Two.

- Stage Three of the project proposes to dredge two channels to connect the newly created wetland to the Swan River. It is this stage of the project that is the subject of the PER.

1.3 Structure of the report

This report has been divided into seven sections.

Section 1 describes the historical background to the proposal and its assessment, and describes the structure of this report.

Job No.	29495-004-367	
Prep. By	JS	21-6-95
Chk'd. By	JS	6-7-95
Rev. No.	2	6-7-95

ASCOT WATERS

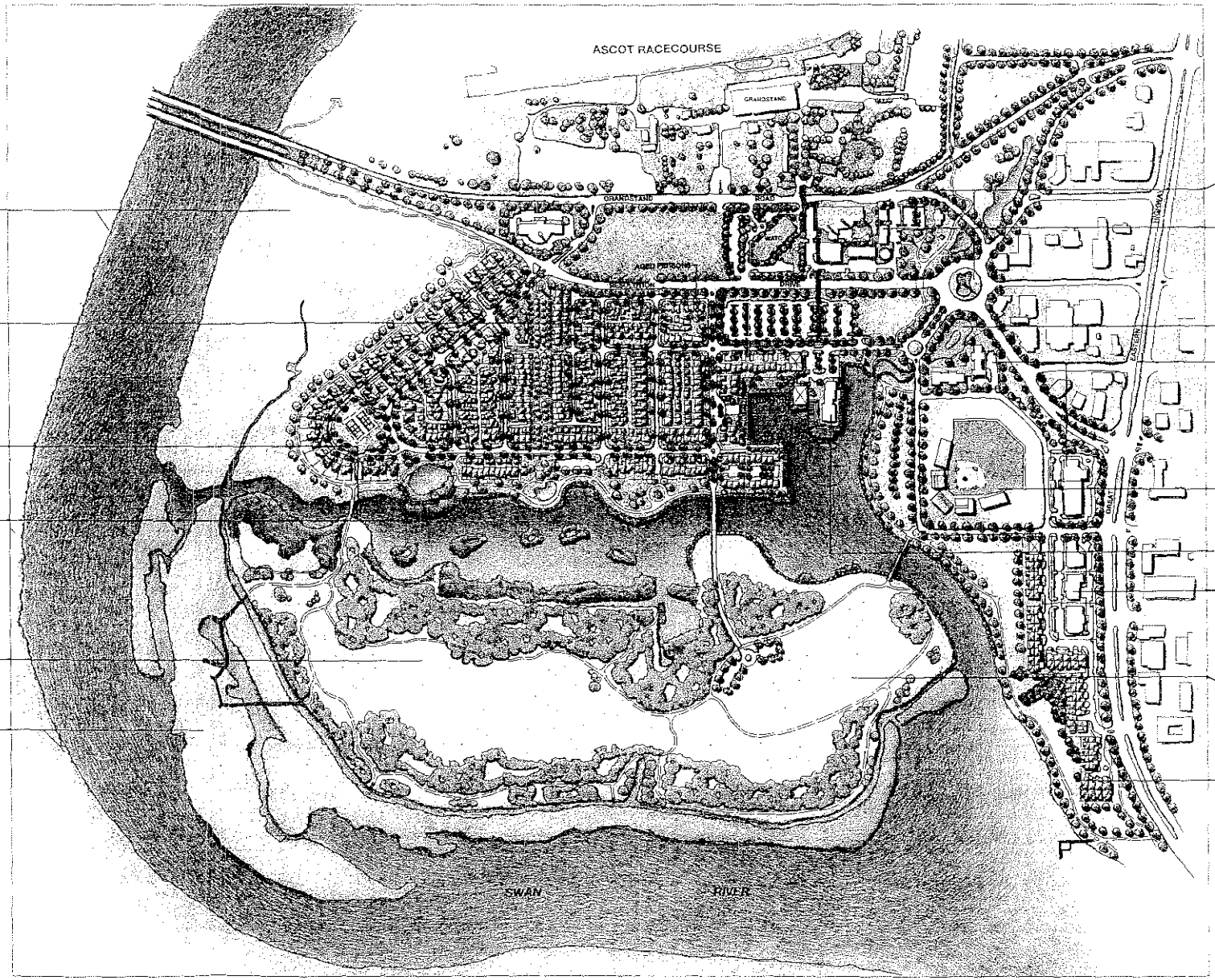
LOCALITY

Frontispiece

LEPROVOST DAMES & MOORE

Figure 1. Ascot Waters locality.

Figure 2. Ascot Waters Development Plan.



0 500m

Job No.	29495-004-367	
Prep. By	JS	21-6-95
Chk'd. By	JS	5-7-95
Rev. No.	2	5-7-95

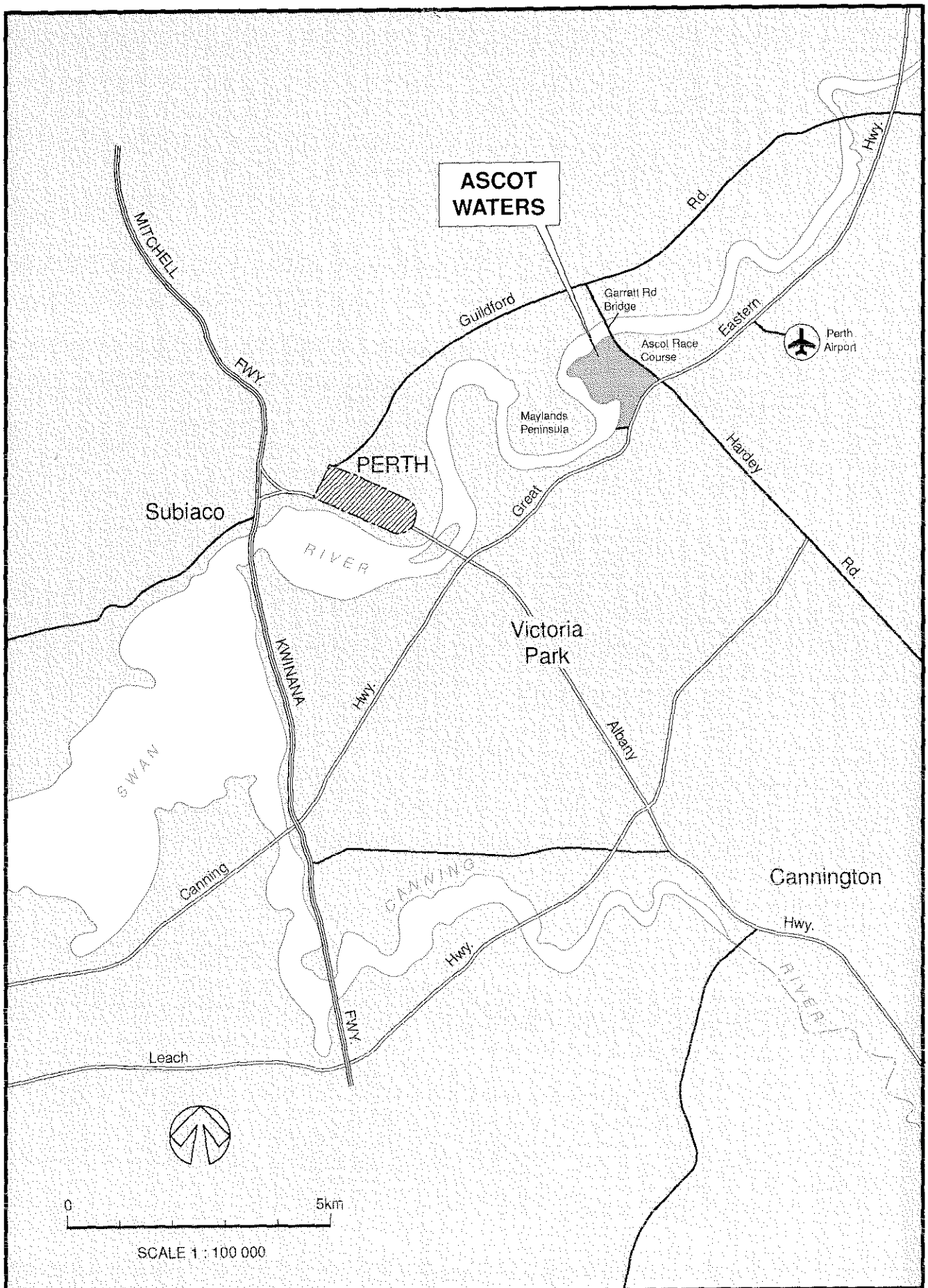
ASCOT WATERS

DEVELOPMENT PLAN

SOURCE : Russell Taylor & William Burrell Town Planners

Figure No. 3

LEPROVOST DAMES & MOORE



Job No.	29495-004-367	
Prep. By	JS	21-6-95
Chk'd. By	ILeP	3-7-95
Rev. No.	2	6-7-95

ASCOT WATERS

PROJECT LOCATION

Figure No. 1

LEPROVOST DAMES & MOORE

Figure 3. Ascot Waters project location.

Section 2 briefly describes the proposal. More detail is provided in the proponent's Public Environmental Review.

Section 3 explains the method of assessment and provides a brief analysis of public submissions.

Section 4 sets out the evaluation of the key environmental topics and issues associated with the proposal. In each sub-section, the objectives and the evaluation framework for the assessment are defined, the likely effects of the proposal are identified, the advice to the Environmental Protection Authority from submissions is summarised and the proponent's response to submissions indicated. Then the adequacy of the response by the proponent is considered in terms of project modifications and environmental management commitments in achieving an acceptable outcome. The Environmental Protection Authority's evaluation and recommendations with respect to identified issues are also contained in this section.

Section 5 summarises the conclusions and recommendations.

Section 6 sets out the recommended environmental conditions.

References cited in this report are provided in Section 7.

2. The proposal

The proposal is to dredge two channels to connect the Swan River with an internal artificial waterbody (refer to Figure 1). Construction of the channel will involve:

- dredging of one 15m wide, 1m deep channel through the System 6 area and nearshore sandbars at the northern end of the wetland;
- the excavation of a 55m wide channel to -2.5m AHD, through the southern end of the tip site; plus
- the dredging of a 320m long, 55m wide navigation channel to -2.5m AHD through river shallows to connect with the main deep channel of the river.

The proponent wishes to dredge the channels so that the river will flush the internal waterbody maintaining an acceptable water quality and to allow limited navigable access to shallow draft boats to the marina within Ascot Waters.

A component of the proposal is the realignment and installation of short term retention basins in the Central Belmont Main Drain to improve the quality of water entering the river from the drain and reduce the risk of contaminants entering the channel.

3. Environmental impact assessment method

3.1 Steps in the procedure of assessment

The purpose of the environmental impact assessment is to determine whether a proposal is environmentally acceptable, or under what conditions it could be environmentally acceptable.

A set of administrative procedures has been identified (refer to flow chart in Appendix 2) in order to implement this method of assessment.

The first step in the method is to identify the environmental topics to be considered. A list of topics (or possible issues) is identified by the Environmental Protection Authority through the preparation of guidelines which are referred to relevant agencies for comment prior to being finalised.

These topics are then considered by the proponent in the Public Environmental Review both in terms of identifying potential impacts as well as making project modifications or devising environmental management strategies.

The Public Environmental Review is checked to ensure that each topic has been discussed in sufficient detail by the proponent prior to release for government agency and public comment. The submissions received are summarised by the Department of Environmental Protection on behalf of the Environmental Protection Authority.

Proponents are invited to respond to the issues raised in the submissions. A list of submitters appears in Appendix 3. Appendix 4 contains a summary of the issues raised in the submissions and Appendix 5 contains the proponent's response to those issues. Nine submissions were received, of which four were from government agencies and five from conservation groups and the public.

This information, namely the Guidelines, the proponent's Public Environmental Review, the submissions and the proponent's response, is then subjected to analysis for environmental acceptability. Table 1 summarises this process. Those topics for which the impact has cause for concern and require further evaluation become issues. For each environmental issue, an objective is defined, evaluation framework is identified and the proponent's commitments are examined.

For this proposal time constraints meant that the EPA considered the strategy for assessment using Table 1, prior to the proponent revising their commitments. The proponent attended the strategy meeting, and agreed to the EPA's recommendations on outstanding issues and preparation of commitments consistent with those recommendations.

The expected impact of the proposal, with due consideration to the proponent's revised commitments to environmental management, is then evaluated against the assessment objective. Where the proposal, as defined by the proponent, has unacceptable environmental impacts the Environmental Protection Authority can either advise the Minister for the Environment against the proposal proceeding or make recommendations to ensure the environmental acceptability of the proposal.

Limitations

This evaluation has been undertaken using information currently available. The information has been provided by the proponent through preparation of the Public Environmental Review document (in response to guidelines issued by the Environmental Protection Authority), by Department of Environmental Protection officers utilising their own expertise and reference material, by utilising expertise and information from other State government agencies, information provided by members of the public, and by contributions from Environmental Protection Authority members.

The Environmental Protection Authority recognises that further studies and research may affect the conclusions. Accordingly, the Environmental Protection Authority considers that if the proposal has not been substantially commenced within five years of the date of this report, then such approval should lapse. After that time, further consideration of the proposal should occur only following a new referral to the Environmental Protection Authority.

3.2 Public submissions

Comments were sought on the proposal from the public, community groups, as well as local and State government agencies. During the public submission period from 10 July to 4 September 1995, nine submissions were received. A summary (refer Appendix 4) and a copy of these submissions was forwarded to the proponent for response. Submissions received by the Environmental Protection Authority were within the following categories:

- 1 from a member of the public;
- 4 from interest groups and organisations; and
- 4 from State and other government agencies.

Table 1. Identification of issues requiring EPA evaluation

TOPICS (source)	INITIAL STATE	PROPOSAL CHARACTERISTICS	GOVERNMENT AGENCY'S COMMENTS	PUBLIC COMMENTS	PROPONENT'S RESPONSE	IDENTIFICATION OF ISSUES
Biophysical impacts						
1.Impact of dredging on the Swan River during dredging. (Guidelines)	•Artificial wetlands and river foreshore. •Existing channels across the river foreshore including the Central Belmont Main Drain and a natural channel. The channels are located in the vicinity of the proposed dredging.	•Dredge two channels to connect internal artificial wetland to the river.	•SRT require: -silt curtains to be used; -a long term waterways manager to be identified; and -contingency strategies to be prepared. •dredging to be conducted to the satisfaction the Trust (SRT)	•The dredging will interfere with the natural river course and river environment, and cause destruction to marine life. (2 submissions)	•Prepare an EMP as per SRT guidelines and submit to SRT for approval prior to its implementation. The EMP is to include the following commitments: -dredge during autumn and winter. -to settle water in stilling pond prior to discharge to river. -use of silt curtains. -monitor water quality and benthic fauna. •Ambient water quality concentration is to be determined as per SRT guidelines. •Interference with river processes will be minor. The channel will not alter the foreshore as there is an existing channel and drain. •Benthic fauna disturbed by dredging will recolonise rapidly after dredging.	EPA EVALUATION REQUIRED If considered in isolation, approval to dredge may not be justified. However, the Ascot Waters proposal is considered to be a net benefit to the river environment on the basis that it provides replacement wetlands well in excess of the area disturbed by dredging, it provides replacement river environment well in excess of the river environment disturbed by dredging;relocates the Central Belmont Main Drain and adds retention basins to the drain to improve the quality of water flowing into the river. (refer to Issue 1 in Table 2)
2.On-going impact of repeated dredging (Public submission)	Benthic fauna in dredged area	•Maintenance dredging to occur once every 20 -25 years with remedial dredging after flood events.	Not applicable	•On going dredging will cause destruction to marine life.	PER states that an EMP to minimise impact of maintenance dredging on Swan River will be prepared and submitted to SRT for approval prior to its implementation to the satisfaction of SRT.	EPA EVALUATION REQUIRED On going dredging impacts can be dealt with as part of the ongoing management of the waterway. (refer to Issue 1 and 5 in Table 2)

Table 1. Identification of issues requiring EPA evaluation

TOPICS (source)	INITIAL STATE	PROPOSAL CHARACTERISTICS	GOVERNMENT AGENCY'S COMMENTS	PUBLIC COMMENTS	PROPONENT'S RESPONSE	IDENTIFICATION OF ISSUES
3.Impact on System 6 (M51). Modification of habitat (Guidelines)	M51 has been partly modified with channels and radio tower. The areas is of considerable environmental value for saltmarsh, sedge and waterbird habitat.	•Dredge one channel through a portion of M51 resulting in a loss or modification of S6 habitat. •Replace lost System 6 habitat and rehabilitate regional open space.	Not applicable	•Concern that replacement wetlands will not support saltwater samphire communities or benefit the environment.	•System 6 management plan to be prepared. •Replant in accordance with a Landscape Master plan •Replace lost habitat so that there is a net increase riverine habitat •The channel will go through sedge not saltmarsh. The replacement habitat will be the same as that being lost. •Monitor success of replacement wetland revegetation and waterfowl use of these wetlands.	EPA EVALUATION REQUIRED Proponent should be required to prepare an EMP for the replacement and rehabilitation of System 6 to meet the requirements of Min for Env on advice from the SRT and DEP. (refer to Issue 2 in Table 2)
4. Environmental value of artificial wetlands (Public submissions)	Artificial wetlands have been recontoured in accordance with Stage one approvals.	Not applicable	Not applicable	•The depth of the channel will not have the same ecological function as the existing artificial lakes. •The PER undervalues the site as a water bird habitat	•The western shoreline and the braided channel will be shallow to provide feeding grounds for wading birds similar to seasonal wetlands. •The channel has been specifically designed to accommodate waterbirds	NO EPA EVALUATION REQUIRED Assessed as part of the residential component of the proposal (Stage One) which included recontouring the artificial wetlands.

Table 1. Identification of issues requiring EPA evaluation

TOPICS (source)	INITIAL STATE	PROPOSAL CHARACTERISTICS	GOVERNMENT AGENCY'S COMMENTS	PUBLIC COMMENTS	PROPONENT'S RESPONSE	IDENTIFICATION OF ISSUES
Pollution						
5.Management and monitoring of leachate from tip site. (Guidelines)	•SRT monitoring indicates low but acceptable levels of leachate in the river from the tip site.	•Limited tip site earthworks. •The southern channel involves minor cutting through tip site.	•SRT advice that leachate levels are low and acceptable. •The SRT require the preparation of a leachate monitoring programme. •Details of clay capping of the tip site are to be submitted to the SRT. •The City of Belmont has advised that the tip was only legally used for domestic waste.	•Concern regarding the nature of materials in the tip and the risk of leachates entering the river. •The current earthworks should have been the subject of a PER.	•Prepare an EMP for construction of the channel. The EMP will include the following commitments: -install clay lined seal. -monitor for leachates over a 6 mth period. -incorporate a monitoring programme. •The EPA has previously given informal advice on the recontouring of the wetlands. •A waterways monitoring programme will be prepared to assess the effectiveness of flushing and capping. •Existing evidence indicates that leachates levels are low and the rate of leachates coming from the tip has decreased over the last 15 years.	EPA EVALUATION REQUIRED. Available evidence suggests that leachate from the tip site should remain at existing low levels. Monitoring of water quality will detect any changes. Contingency plans are required should levels of contaminants reach unacceptable levels. EPA recommended EMP required for monitoring and a contingency plan. (refer to Issue 3 in Table 2)
6. Management of Central Belmont Main Drain (Guidelines)	•Intermittent high bacteria nutrient load •Drains Ascot racecourse and urban areas.	•Move drain outfall 250m downstream. •Retention basins to be installed to settle and strip contaminants.	•The redesign of the drain is to be to the satisfaction of SRT and the Water Authority.	•Should be upgraded regardless of the project.	•Relocate and redesign the Central Belmont Main Drain. •Initial management (for the first 12 months) of the landscaped components of the modified CBMD will be undertaken by the consortium, then management will revert to WAWA and the City of Belmont.	EPA EVALUATION REQUIRED Rehabilitation of the drain is a net benefit to the river. EPA recommended that an EMP be prepared to the requirements of the Min for Env on advice from the SRT and DEP to manage details. (refer to Issue 4 in Table 2).

Table 1. Identification of issues requiring EPA evaluation

TOPICS (source)	INITIAL STATE	PROPOSAL CHARACTERISTICS	GOVERNMENT AGENCY'S COMMENTS	PUBLIC COMMENTS	PROPONENT'S RESPONSE	IDENTIFICATION OF ISSUES
7.Management of waterways water quality (Guidelines)	•Inland artificial wetlands	•Dredging two channels to connect the artificial wetland with the river.	•SRT advise that the proposal is not supported until a long term waterways manager is identified and clearly defined in a deed of agreement. •SRT have advised that the channel should be managed in accordance with the WAPC Canal Policy DC 1.8. •The proponent is to prepare and submit a waterways management programme.(SRT)	Not applicable	•EMP for monitoring to be prepared. •Commitments for the long term future management of the proposed waterway will be finalised once the consortium confirm its acceptance of the approval conditions of the PER. •Water quality will be maintained by the consortium for 5 years. •WAPC are liaising with other government agencies regarding management of the channel after 5 years.	Long term future management has not been resolved. EPA EVALUATION REQUIRED. (refer to Issue 5 in Table 2)
8.Contingency plans required in the event that water quality in the channel declines. (SRT)	Artificial inland wetland	•Dredging two channels to connect the artificial wetland with the river.	•The proposal is not supported until contingency plans are prepared . (SRT)	Not applicable	•Contingency plan to be prepared will include the following measures: -Malodours - install a bubble curtain oxygenator to oxygenate and mix the waterbody by to overcome anoxia. -Algae - confined by booms, retrieved by an oil skimmer.	EPA EVALUATION REQUIRED The EPA recommended the preparation of a contingency plan to the satisfaction of the Min for Env on advice from SRT and DEP. (refer to Issue 6 in Table 2)

Table 1. Identification of issues requiring EPA evaluation

TOPICS (source)	INITIAL STATE	PROPOSAL CHARACTERISTICS	GOVERNMENT AGENCY'S COMMENTS	PUBLIC COMMENTS	PROPONENT'S RESPONSE	IDENTIFICATION OF ISSUES
9.Channel flushing (Public submission) (refer to Topic 7)	Not applicable	•Dredging two channels to connect the artificial wetland with the river.	•The SRT has advised that the model and calculations used to calculate flushing times are satisfactory and in accordance with SRT requirements. •A monitoring programme is to be prepared to assess the effectiveness of flushing.(SRT)	•There is a risk to the channel and the river environment if the channel does not flush properly.	•The channel has been designed to the satisfaction of the SRT.	EPA EVALUATION REQUIRED. The proponent should maintain the capacity of the channel to flush as originally designed. This issue can be dealt with as part of the management of the waterway and water quality. (refer to Issue 5 in Table 2)
10.Soil and groundwater contamination. (Guidelines)	•No soil contamination outside body of tip. •Low levels of deldrin in groundwater from regional sources. These levels do not impact on water quality in the river.	No action proposed	•Phosphorus and contaminants leaching from the tip not significant.(SRT)	Risk of groundwater contamination due to disturbance of tip.	•Undertake testing testing and monitoring and necessary rehabilitation.	NO EPA EVALUATION REQUIRED Leaching from the tip is not significant (refer to Issue 3 in Table 2 for on-going monitoring)
11.Stormwater management. (Guidelines)	•Currently contained in wetlands	•Residential development adjacent to proposed channel. •Direct runoff avoided.	Not applicable	Not applicable	•Implement water sensitive urban design and stormwater runoff treatment system.	NO EPA EVALUATION REQUIRED Stormwater management is adequately managed through the subdivision process by the WAPC to the satisfaction of the Water Authority and the SRT.

Table 1. Identification of issues requiring EPA evaluation

TOPICS (source)	INITIAL STATE	PROPOSAL CHARACTERISTICS	GOVERNMENT AGENCY'S COMMENTS	PUBLIC COMMENTS	PROPONENT'S RESPONSE	IDENTIFICATION OF ISSUES
12.Noise and light overspill impacts from Parry Fields. (Guidelines)	•Existing baseball stadium	•Parry fields baseball stadium is being removed.	City of Belmont have advised that the stadium will be relocated	Not applicable	Not applicable	NO EPA EVALUATION REQUIRED This topic is no longer a matter of concern as it is proposed to relocate Parry Fields.
Social Surroundings						
13.Mosquitos (public submissions)	The communication tower has disrupted water flow and the area near the tower is recognised as a significant mosquito breeding area. The mosquito species in the area are carriers of Ross River virus and Barmah Forest virus	•Some breeding areas have been removed in the artificial wetlands.	•The SRT require a mosquito control strategy to be developed. •Inform all prospective buyers of property in the Ascot Waters development in writing of the mosquito nuisance and associated health risk.(Health Department)	•Residential development is likely to increase the use of chemicals to control mosquitos which will harm waterbirds.	•Prepare a physical mosquito control strategy implementing techniques such as runnelling and spot filling . •Stage One (residential component) has been previously assessed by the EPA and is not the subject of the current PER. •This issue should be managed at a regional not at a site specific level.	EPA EVALUATION REQUIRED The EPA recommended that an EMP be prepared to the satisfaction of the the Health Dept, SRT and DEP. (refer to Issue 7 in Table 2)
14.Managing recreation in the System 6 area (Guidelines) (see also topic 3)	No present management other than chemical mosquito control	•Construct a boardwalk to control access to System 6. •Ministry for Planning responsible for managing.	•A foreshore management plan to be prepared to the satisfaction of the SRT	•Public access should not be provided to System 6 as it will result in the degradation of the environment.	•Preparation of a Foreshore Management Plan as required by SRT. •Remove rubbish and exotic plants. •The boardwalks will provide controlled access to observation points. It is better to provide controlled access than none at all.	EPA EVALUATION REQUIRED EPA recommends that the System 6 values are protected consistent with the System 6 recommendations. (refer to Issue 2 in Table 2)

Table 1. Identification of issues requiring EPA evaluation

TOPICS (source)	INITIAL STATE	PROPOSAL CHARACTERISTICS	GOVERNMENT AGENCY'S COMMENTS	PUBLIC COMMENTS	PROPONENT'S RESPONSE	IDENTIFICATION OF ISSUES
15.Recreation Boating. (Public submissions)	Small boats use river upstream from the Causeway.	•Small boats permitted to southern third of the channel. •Limited size marina to be constructed. •Canoeing permitted elsewhere.	Not applicable	•Increased boat activity associated within the marina will impact on the river environment	•Boats are permitted in other parts of the river and should not be restricted from the channel.	NO EPA EVALUATION REQUIRED This matter to be considered by the Department of Transport.
16.Aboriginal heritage (Guidelines)	•No known archaeological sites.	Not applicable	Not applicable	Not applicable	•To establish an on-going consultation programme with the local community and a monitoring programme to ensure archaeological interests are protected during the earthworks period to the satisfaction of the Department of Aboriginal Affairs.	NO EPA EVALUATION REQUIRED The proponent's response to this matter is adequate and it is also considered to be the responsibility of the Department of Aboriginal Affairs.
17.Landscape amenity (Guidelines)	•Development site has poor amenity as a result of landfill and clay excavation. •River landscape has high amenity .	•Restoration of flood plain landscape values •SRT and Ministry for Planning responsible for managing.	•Plans showing the location and design of all waterways edges is to be approved by the SRT	Not applicable	•To prepare a Landscape Master Plan showing the location and design of all waterway and wetland foreshore edges and submit to the SRT for approval prior to implementation.	NO EPA EVALUATION REQUIRED The proponent's response to this matter is adequate.

The principal topics of concern raised in the submissions are:

Biophysical

- acceptability of dredging on the Swan (during dredging);
- on - going impact of dredging;
- impact on System 6 - loss of habitat;
- environmental value of artificial wetlands;

Pollution

- management and monitoring of leachate from tip site;
- management of Central Belmont Main Drain;
- management of waterways and water quality;
- contingency plans required in the event that water quality in the channel declines;
- channel flushing;
- soil and groundwater contamination;
- stormwater management;

Social Surroundings

- mosquitoes.
- managing recreation on the System 6 area; and
- recreation boating.

Not all the topics raised in the submissions have been listed above as some are landuse planning issues such as cycle paths and not directly related to the environmental impact assessment.

The Environmental Protection Authority has considered the submissions received and the proponent's response as part of the assessment of the proposal.

3.3 Synopsis of submissions

Submissions received by the Environmental Protection Authority were primarily concerned with the following topics:

Biophysical

Acceptability of dredging on the Swan River

Several submissions were concerned that dredging would interfere with the natural river course and river environment and cause destruction to marine life.

The Swan River Trust requires that silt curtains are to be used at the dredge site and at the outfall of the basin.

The Environmental Protection Authority's evaluation of the impacts of dredging on the Swan River is contained in Section 4.1.

On - going impact of dredging

A number of submissions were concerned that on-going maintenance dredging would cause destruction to marine life and would be one of the main contributors for the decline of the river.

This matter is considered in Sections 4.1 (Acceptability of dredging) and 4.5 (Management of waterways and water quality). Refer to Table 1 for the Environmental Protection Authority's comment on this matter.

Impact on System 6 (loss of habitat)

It was indicated in a number of submissions that the replacement wetlands would not be adequate and would not support saltwater samphire communities or benefit the environment.

The Environmental Protection Authority's evaluation of the impacts of the channel through land identified in System 6 is contained in Section 4.2.

Environmental value of artificial wetlands

A number of submissions were concerned that the depth of the channel would not have the same ecological function as the existing artificial lakes and the site is undervalued as a waterbird habitat.

Refer to Table 1 for the Environmental Protection Authority's comment on this matter.

Pollution

Management and monitoring of leachate from tip site

A number of submissions were concerned about industrial waste that may be in the tip and the risk of leachates entering the river via the channel as a result of disturbance caused to the tip during earthworks. Comments were also made that the current earthworks to recontour the wetlands should have been the subject of a formal environmental impact assessment.

There were also concerns that there should be more monitoring for leachates from the tip.

The City of Belmont advised that the tip was only legally used for domestic use only.

The Swan River Trust has provided details of the monitoring that has been conducted and has also advised that a leachate monitoring programme is to be prepared by the proponent.

The Environmental Protection Authority's evaluation of the leachate from the tip site is contained in Section 4.3.

Management of Central Belmont Main Drain

One submission noted that the Central Belmont Main Drain should not be used to justify the channel and should be upgraded independently of the project.

The portion of the drain affected by this proposal is to be redesigned to the satisfaction of the Water Authority and Swan River Trust.

The Environmental Protection Authority's evaluation of Central Belmont Main Drain is contained in Section 4.4.

Management of waterways and water quality

The Swan River Trust advised that the:

- a long term waterways manager is to be identified and clearly defined in a deed of agreement;
- channel should be managed in accordance with the Western Australian Planning Commission Canal Policy DC 1.8; and
- proponent is to prepare and submit a waterways management programme.

The Western Australian Planning Commission is negotiating with a number of Government agencies regarding the future management of the channel after 5 years.

The Environmental Protection Authority's evaluation of waterways management and water quality are contained in Section 4.5.

Contingency plans required in the event that water quality in the channel declines

The Swan River Trust advised that contingency plans are to be prepared in the event of a significant decline in water quality.

The Environmental Protection Authority's evaluation of waterways management and water quality are contained in Section 4.6.

Channel flushing

A number of submissions were concerned with the risk to the river environment if the channel did not flush properly.

The Swan River Trust and a Technical Review Group have advised that the model and calculations used to calculate flushing times are satisfactory and in accordance with its requirements. The Trust also requires the implementation of a monitoring programme to assess the effectiveness of flushing.

The Environmental Protection Authority's evaluation of contingency plans is contained in Section 4.5.

Refer to Table 1 for the Environmental Protection Authority's comment on this matter.

Soil and groundwater contamination

A number of submissions were concerned that the disturbance to the tip caused by the earthworks may result in leachates polluting the groundwater.

The Swan River Trust advised that phosphorus and other contaminants leaching from the tip is not significant.

The Environmental Protection Authority's evaluation of waterways management and water quality are contained in Section 4.6.

Refer to Table 1 for the Environmental Protection Authority's comment on this matter.

Stormwater management

The Swan River Trust has advised that direct drainage into the Swan River is prohibited to prevent contaminants enter the river via urban runoff.

Refer to Table 1 for the Environmental Protection Authority's comment on this matter.

Social Surroundings

Mosquitoes

A number of submissions including those from the Health Department of Western Australia and the Swan River Trust were concerned at the proximity of the proposed residential development to the saltmarsh, which is the breeding area of two species of mosquitoes.

The Health Department advised that the communications tower situated in the System 6 saltmarsh has severely disrupted water flow in the area. In addition copper radial wires have created depressions providing ideal areas for mosquito breeding.

The Health Department and Swan River Trust both recommended that a mosquito control strategy be prepared as a condition of approval. The Health Department recommended physical modifications to the site in the form of spot filling.

A number of submissions suggested that the proposed residential development would result in chemical spraying to control mosquitoes which would affect the waterbirds.

The Environmental Protection Authority's evaluation of mosquitoes is contained in Section 4.7.

Managing recreation on the System 6 area

One submission advised that the proposal would allow and encourage the public to intrude into a fragile area of wetlands and suggested that public access should be restricted.

The Swan River Trust advised that a foreshore management plan should be prepared which should include proposed landscaping and boardwalk construction.

Refer to Table 1 for the Environmental Protection Authority's comment on this matter.

Recreational boating

A number of submissions suggested that the proposed channel and marina would cause an increase in boating activity resulting in increased pollution, noise and river bank erosion. It was also noted that environmental restoration and the use of power boats in the channel would not be compatible.

Refer to Table 1 for the Environmental Protection Authority's comment on this matter.

4. Evaluation of key environmental topics

Seventeen topics were raised during the environmental impact assessment process including those topics identified in the Environmental Protection Authority's guidelines and the submissions described above. The topics are as follows:

Biophysical

- acceptability of dredging on the Swan (during dredging);
- on - going impact of dredging;
- impact on System 6 - loss of habitat;
- environmental value of artificial wetlands;

Pollution

- management and monitoring of leachate from tip site;
- management of Central Belmont Main Drain;
- management of waterways and water quality;
- contingency plans required in the event that water quality in the channel declines;
- channel flushing
- soil and groundwater contamination;
- stormwater management;
- noise and light overspill impacts from Parry Fields;

Social Surroundings

- mosquitoes.
- managing recreation in the System 6 area;
- recreation boating; and
- Aboriginal heritage;
- landscape amenity

Table 1 summarises the process used by the Environmental Protection Authority to identify the topics raised during the environmental impact assessment process. Table 1 briefly describes the characteristics of the proposal, the comments received from the public and government agencies and the proponent's response to these comments.

The Environmental Protection Authority considers that a number of the topics can be managed by the proponent in accordance with its environmental management commitments, or can be dealt with by other government agencies. These topics are environmental value of artificial wetlands, soil and groundwater contamination, stormwater management, noise and light overspill impacts from Parry Fields, recreation boating, Aboriginal heritage and landscape amenity. These topics are not considered to be issues requiring further Environmental Protection Authority evaluation and are not discussed in the following evaluation.

There are ten topics identified in Table 1 warranting further evaluation by the Environmental Protection Authority. Some of the topics have been combined resulting in seven issues being evaluated in this section.

Biophysical

- acceptability of dredging on the Swan River ;
- impact on System 6 including the issue managing recreation on the System 6 area;

Pollution

- management and monitoring of leachate from tip site including soil and groundwater contamination;
- management of Central Belmont Main Drain;
- management of waterways and water quality including the issues channel flushing and ongoing impact.;
- contingency plans required in the event that water quality in the channel declines;

Social Surroundings

- mosquitoes.

An evaluation of these seven issues is set out below and summarised in Table 2.

4.1 Acceptability of dredging on the Swan River

4.1.1 Objectives

To minimise the impact of dredging on the Swan River with the outcome being a net benefit to the river.

4.1.2 Evaluation framework

Existing policy framework

The Environmental Protection Authority has adopted the following policies and recommendations with respect to dredging in the Swan River.

- Environmental Protection Authority (1987) Annual Report Statement

  "it is considered that the river system is a public trust rather than a resource to be appropriated to the benefit of individuals".

  In stating this view, the EPA acknowledged that while this value is not quantifiable, it is one to which the Authority must give recognition and expression when evaluating proposals.

- Riverside Gardens (West) dredging and landfill, Bayswater. Bulletin 575. (EPA, 1991)

  When considering this proposal to dredge the river in Bayswater in 1991 the EPA considered that:

  "proponents of dredging proposals must not only satisfy the Authority that they will not cause adverse impacts to the river system, but must go further and show that the dredging will be environmentally beneficial to the river, or necessary for the maintenance of existing river activities".

Table 2: Summary of Environmental Protection Authority recommendations

Issues	Environmental Objective	Evaluation Framework	Summary of Proponent's Commitments	EPA Recommendation
Biophysical impacts				
1.Impact of dredging on the Swan River during dredging.	•Minimise the impact of dredging on the river system during dredging and demonstrate that dredging will be environmentally beneficial to the river.	•Dredging to result in a net benefit to the river. •The river is a public trust rather than a resource to be appropriated to the benefit of individuals. •Impact on pedestrian access along the foreshore.	•To prepare an EMP for minimising the impact of dredging on the Swan River and System 6 as per SRT guidelines and submit to SRT for approval prior to its implementation. The EMP is to include commitments: -to dredge during autumn /winter months; -to settle dredge water in stilling pond prior to discharge to river. •To implement approved EMP, including use of silt curtains, monitoring of water quality and benthic fauna and reporting of results. (See commitment 1 and 2)	•Proponent's commitments are considered adequate.
2.Impact on System 6 (M51)	•To encourage the growth and regeneration of local indigenous flora; maintaining water bird habitats; and allowing recreation activities which are compatible with the conservation of flora and fauna.	•Comply with System 6 Recommendation M51 and establish adequate management.	•To prepare an EMP for replacement of System 6 sedge habitat removed by dredging the channels and submit to authorities for approval prior to its implementation. •To monitor the success of habitat replacement and report findings to appropriate authorities. •To prepare and implement an EMP to address public access and weed/rubbish/pest/domestic pet control within the System 6 area. The EMP is to be submitted to authorities for approval prior to its implementation. (See commitments 3 and 4)	•Proponent's commitments are considered adequate.
Pollution				
3.Management and monitoring of leachate from tip site.	•To ensure that leachate from the tip does not result in a decline in water quality in the river and waterway or affect the environmental values of the river.	•The Draft Swan and Canning Rivers Environmental Protection Policy is being prepared to protect the water quality necessary to support the multiple and diverse environmental values of the waterway. •Water quality to comply with WA Guidelines for Fresh and Marine Waters.	•To prepare an EMP for construction of the channel through the southern end of the tip site and submit to authorities for approval prior to construction of channel EMP to include commitments to: -install clay lined seal on tip side of channel; -monitor for leachates in channel over period of 6 months after completion; -incorporate channels in waterways monitoring programme; -develop contingency plan in association with SRT/DEP and Geological Survey in event of serious leachates being detected. (See commitments 5 and 6).	•Proponent's commitments are considered adequate.

Table 2: Summary of Environmental Protection Authority recommendations (cont'd)

Issues	Environmental Objective	Evaluation Framework	Summary of Proponent's Commitments	EPA Recommendation
4.Management of Central Belmont Main Drain.	•To ensure that water quality in the drain is maintained or improved so that the environmental values of the river are protected.	•The Draft Swan and Canning Rivers Environmental Protection Policy states that: -all reasonable and practicable means shall be taken to maintain or improve water quality; and -to achieve and maintain discharges of nutrients in amounts which do not create growths of aquatic life at populations that impair the environmental values.	•The consortium will remediate the CBMD and its outlet in accordance with the proposals set out in the PER or any alternative improved arrangement mutually acceptable to the consortium and the relevant authorities and with the approval of detailed working drawings by the Water Authority of Western Australia and the City of Belmont. •Initial management (for the first 12 months) of the landscaped component of the modified CBMD will be undertaken by the consortium, following which management will revert to the City of Belmont/WAWA. See commitments 7 and 8.	•Proponent's commitments are considered adequate.
5.Management of waterways and water quality.	•To ensure that water quality in the proposed channel system is maintained or improved over the long term and is consistent with water quality in the Swan River, so that the environmental values are protected. •On-going management to maintain flushing characteristics.	•WAPC Policy DC 1.8 - Procedures for Approval of Artificial Waterways and Canal Estates, outlines minimum provisions within canal estates for a range of topics including water quality. •Several specific policies have been developed by the Swan River Trust to manage potential sources or water quality problems during construction, including Dredging Policy DE 1 and Dewatering Policy DE 6. •Water quality to comply with WA Guidelines for Fresh and Marine Waters.	•Commitments for long term management (more than 5 years)of waterways will be finalised once the consortium confirm acceptance of approval conditions of PER. •Waterway management in the short term (first 5 years) will be the responsibility of the consortium. The consortium will prepare an EMP for the monitoring and management of the waterways and submit it to appropriate authorities for approval prior to implementation. To implement the approved EMP including: -investigation of water exchange characteristics; -investigation of significant algal bloom; -regular monitoring (quarterly) of indicator water quality parameters; -monitoring of benthic recolonisation; -monitoring success of wetland vegetation establishment around foreshore; -bathymetric monitoring of channel sedimentation in spring; -monitoring of navigable depth, structural integrity of walls and beacons; -annual reporting of findings above; implementation of contingency plans in the event that water quality declines to levels unacceptable for indirect recreational use (boating) and maintenance of the waterway ecosystem; -monitoring and removal of rubbish; and -management plan for marina. See commitments 9, 10, 11 and 12.	•Proponent's commitments are considered adequate. •EPA recommends audit report on environmental management performance at least 6 months prior to proposed handover to the State.
6.Contingency plans required in the event that water quality in the channel declines.	•To ensure that water quality in the proposed channel system is acceptable over the long term so that the environmental values are protected.	•The WAPC Policy DC 1.8 - Procedures for Approval of Artificial Waterways and Canal Estates states that the attainment and maintenance of acceptable water quality will require active management. •Water quality to comply with WA Guidelines for Fresh and Marine Waters.	•A contingency plan will be prepared to specify the remedial measures to be undertaken in the event of: -malodours caused by stratification and anoxia; and -floating algal scum caused by significant algae bloom. (See commitments 13 and 14).	•Proponent's commitments are considered adequate.

Table 2: Summary of Environmental Protection Authority recommendations (cont'd)

Issues	Environmental Objective	Evaluation Framework	Summary of Proponent's Commitment	Final EPA Recommendation
Social				
7. Mosquitoes.	•To control the breeding of mosquitos without adversely affecting other flora and fauna.	•No significant change to flora and fauna.	•To prepare a physical mosquito control strategy in conjunction with the City of Belmont and Health Department and submit to the SRT/DEP for approval prior to implementation. •To implement approved mosquito control strategy; -construction works; -monitoring of water quality; and -reporting details of completed works and monitoring results. (See commitments 15 and 16).	•Proponent's commitments are considered adequate.

- Proposal to dredge a portion of the Swan River and foreshore to provide access to private boathousing, Mosman Park. Bulletin 775. (EPA, 1995) which was recommended for refusal.

The merits of the Ascot Waters dredging proposal are considered to be consistent with the policies and recommendation expressed in Bulletin 775 (EPA, 1995). The Ascot Waters proposal involves the upgrading of a public reserve for continued public use whereas the Bulletin 775 dealt with the use of a public reserve for private purposes. The Ascot Waters proposal is considered to be substantially different from the specific dredging proposal assessed by the Environmental Protection Authority in 1995 and reported to government in Bulletin 775.

The Ascot Waters proposal is considered to be a net benefit to the river environment as it provides replacement wetlands well in excess of the area disturbed by dredging, relocates the Central Belmont Main Drain and adds retention basins to the drain to improve the quality of water entering the Swan River.

Several specific policies have been developed by the Swan River Trust to manage potential sources of water quality problems during construction. These include the Dredging Policy DE 1 and the Dewatering Policy DE 6 which were developed to ensure that water quality is protected during construction.

Technical information

The proposal is to dredge two channels to connect an internal artificial waterbody to the Swan River (refer to Figure 1).

Construction of the channels will involve:

- dredging of one 15m wide, 1m deep channel through the System 6 area and near shore sandbars at the northern end of the wetland;
- the excavation of a 55m wide channel to -2.5m AHD through the southern end of the tip site; plus
- the dredging of a 320m long by 55m wide to -2.5m AHD navigation channel through river shallows to connect with the main deep channel of the river.

Section 4.5 outlines the evaluation framework used for water quality in the Swan River during dredging and construction of the channel while this section considers the direct effect of dredging.

Surveys have been conducted of the benthic fauna in the river shallows abutting the Ascot Waters project. The ten most predominant benthic species comprised three bivalve mollusca, four polychaete worms and three crustaceans. These species represented 85% of the total mean density of macrobenthic fauna (10,533 individuals/m^2).

Comments from key government agencies

The Swan River Trust estimates that over 17 600 m2 of shallow subtidal flats and associated benthos will be dredged and double this area of new subtidal riverine habitat will be created.

The Swan River Trust supports the proposal to dredge the Swan River to connect an artificial wetland with the Swan River in principle subject to conditions requiring the identification of a long term waterways manager; and the preparation of a contingency plan and mosquito control strategy.

The Trust has advised that pedestrian access along the foreshore is currently restricted by channels and the Central Belmont Main Drain and the proposed channels would not further inhibit public access.

4.1.3 Public submissions

One submission considered that the channels would interfere with the natural river course and environment.

4.1.4 Response from the proponent

The proponent has advised that modelling indicates that the channels will not cause a decline in the health of the river.

Benthic fauna will monitored and if necessary recolonisation will be improved by seeding with appropriate species within the dredged areas.

In response to public submissions the proponent advised that the channels already exist and interference with river processes will occur at a minor level.

Commitments

The consortium commits to preparing an Environmental Management Plan (EMP) for minimising the impact of dredging on the Swan River and System 6 as per Swan River Trust guidelines and submit to the Swan River Trust for approval prior to its implementation.

The EMP will include the following commitments:

- to dredge during autumn/winter period while the river has high levels of suspended silt;
- to settle dredge water in stilling ponds prior to discharge to river;
- to include use of silt curtains;
- to monitor water quality and benthic fauna; and
- to report results.

The proponent also commits to implementing the approved EMP.

4.1.5 Evaluation

The Ascot Waters proposal is considered to be a net benefit to the river environment on the basis that:

- it provides replacement wetlands well in excess of the area disturbed by dredging;
- it provides replacement river environment (benthic fauna habitat) well in excess of the river environment disturbed by dredging;
- it will improve the quality of water entering the Swan River from the Central Belmont Main Drain; and
- it will upgrade an area of degraded regional open space for public use.

The merits of the Ascot Waters dredging proposal are consistent with previous Environmental Protection Authority statement and assessments (refer to Section 4.1.1).

It is acknowledged that the dredging will have local impacts on the benthic fauna. The recovery of the river ecology will be monitored by the proponent and measures put in place to assist the recolonisation of the dredged areas if necessary.

The Environmental Protection Authority concludes that the proponent's revised commitments are adequate to meet the objectives in relation to the issue of minimising the impact of dredging on the Swan River.

4.2 Impact on System 6

4.2.1 Objectives

To protect the values of the System 6 area.

To encourage the growth and regeneration of local indigenous flora; maintain water bird habitats; and only allow recreation activities which are compatible with conservation of flora and fauna.

Maintaining and manage public access to the foreshore .

4.2.2 Evaluation framework

Existing policy framework

The river foreshore through which one of the proposed channels will be dredged is identified in the System 6 Report (M51) (refer Figure 4). The System 6 Report recommends that this area be protected and a management plan be prepared.

Technical information

The System 6 Report identifies the environmental values of the site in the following way:

- the saltmarshes, trees and adjoining extensive wading areas make up one of the few undisturbed areas along the river which supports a wide variety of waterbirds;
- the M51 area contributes to open space of regional significance because of its conservation and recreation values; and
- the important management considerations include encouraging growth and regeneration of local indigenous flora; maintaining water bird habitats; and only allowing recreation activities which are compatible with the conservation of flora and fauna.

The saltmarsh within the System 6 area is of particular importance as it is representative of what was once a larger community along the Swan River.

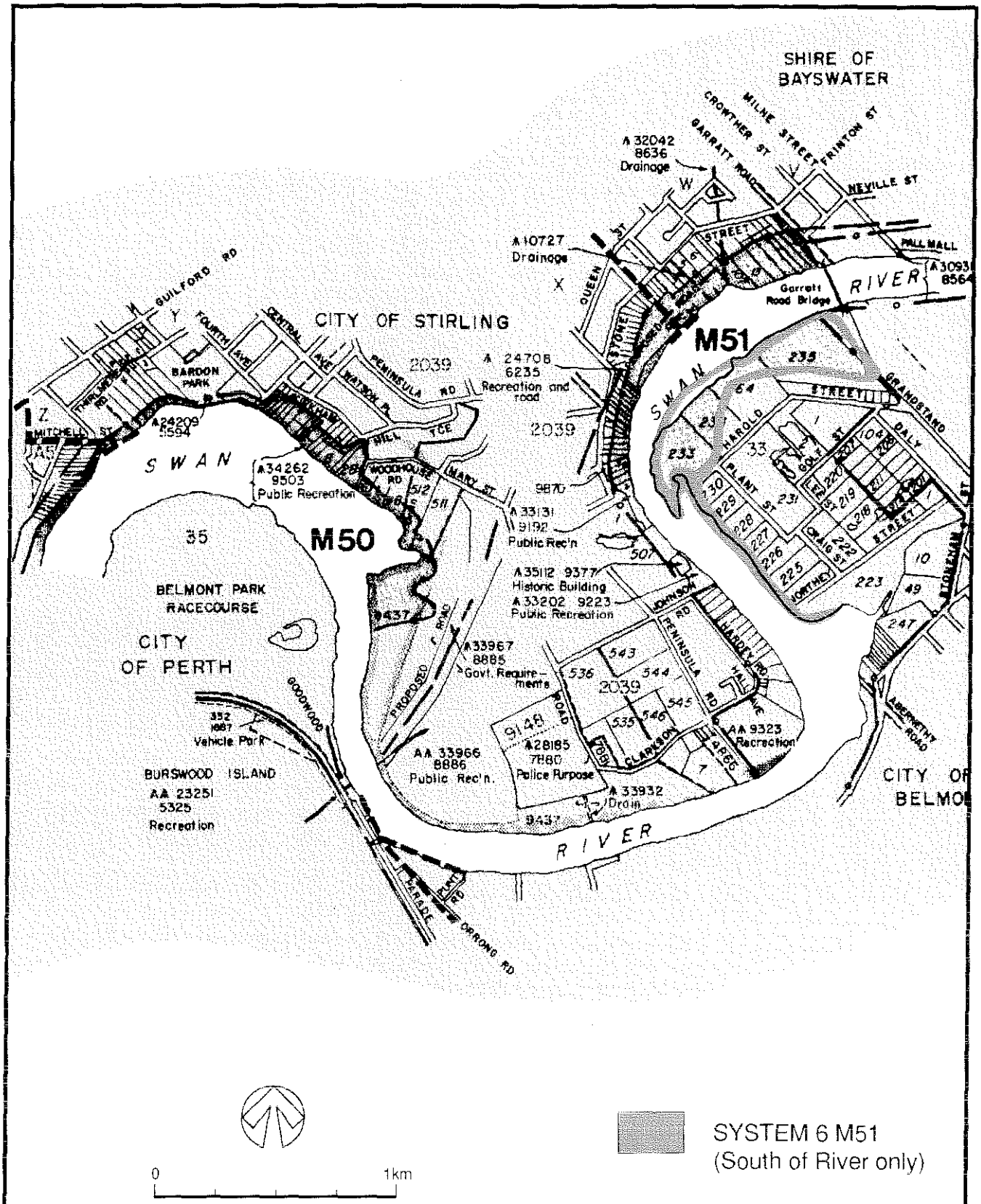
The channel will be dredged through existing sedge habitat and will not affect the saltmarsh. The sedge removed from the System 6 area will be replanted within the channel or nearby foreshore to the satisfaction of the Swan River Trust. The proponent will also re-create an area of riverine sedge habitat within the channel three times the area of System 6 habitat being lost (refer to Figure 5).

A management plan has not yet been prepared for M51.

Comments from key government agencies

The Swan River Trust requires the dredging operation and final design of the channel in the System 6 area to be to their satisfaction.

The Swan River Trust has also advised that a boardwalk will be constructed over the western section of the System 6 area for wildlife observation to highlight the importance of sandbars and saltmarshes.



Job No.	29495-004-367	
Prep. By	JS	21-6-95
Chk'd. By	ILeP	3-7-95
Rev. No.	2	5-7-95

ASCOT WATERS

SYSTEM 6 M51 (CONSERVATION THROUGH RESERVES COMMITTEE)

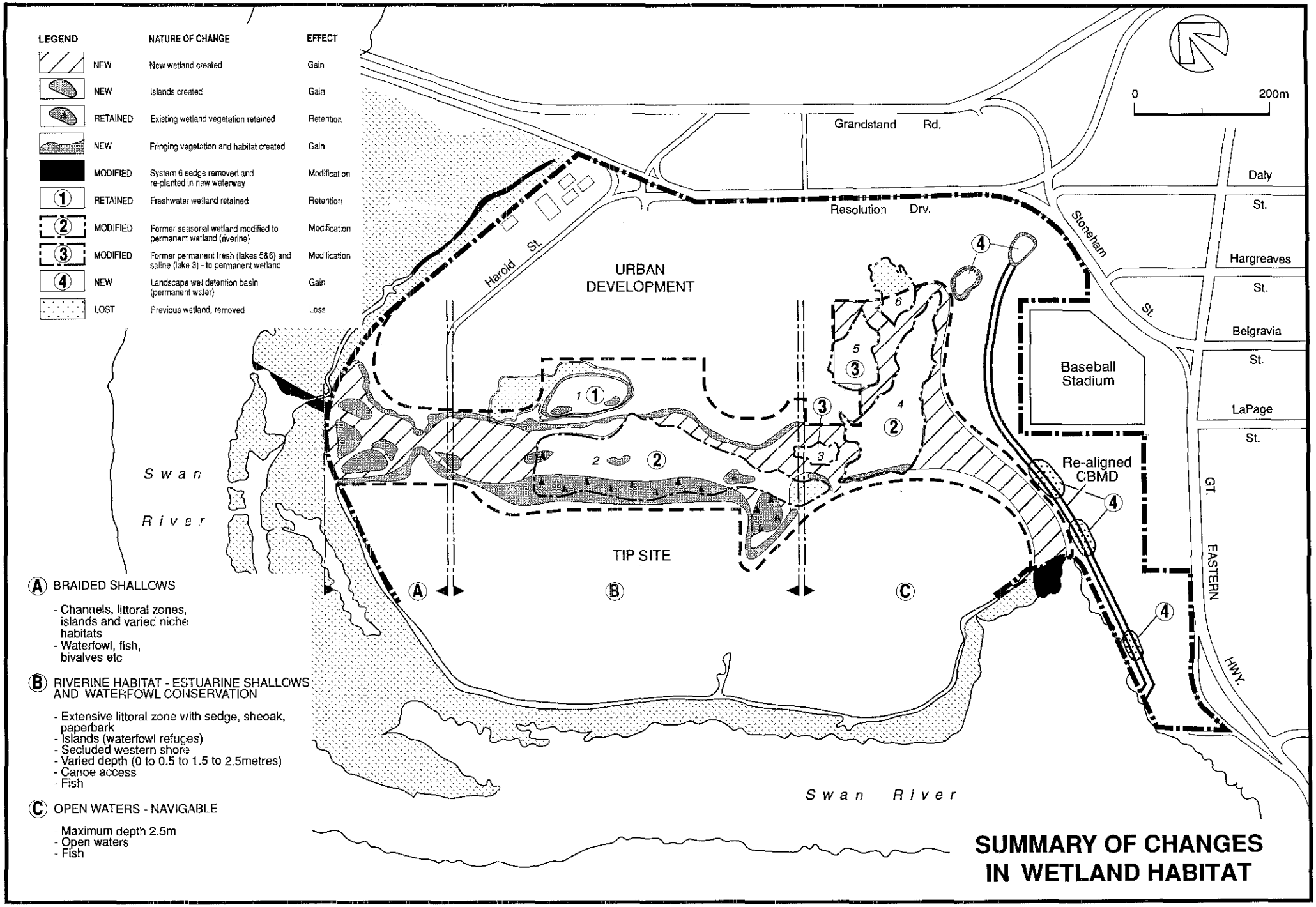
(SOURCE : DCE, 1983)

Figure No. 15

LEPROVOST DAMES & MOORE

Figure 4. System 6 location plan.

Figure 5. Summary of changes in wetland habitat.



4.2.3 Public submissions

It was indicated in a number of submissions that the replacement wetlands would not be adequate and would not support saltwater samphire communities or benefit the environment.

4.2.4 Response from proponent

The proponent has committed to replacing the area of System 6 foreshore being dredged so that there will be a substantial net increase in the habitat compared to that lost through dredging.

The proponent has also advised that the channel will go through sedge not saltmarsh communities. The replacement foreshore areas will be the same as the sedge communities being removed.

The proponent states in the Public Environmental Review that a boardwalk will be provided to control access to the System 6 area.

The proponent has undertaken to landscape the fringes of the channel to create habitats for waterbirds and other fauna.

Commitments

The proponent has committed to prepare an Environmental Management Plan (EMP) and submit the EMP to authorities for approval prior to its implementation. The EMP is to include the following commitments:

- to replace System 6 sedge habitat removed by dredging the channels;
- to monitor the success of habitat replacement and report findings to appropriate authorities; and
- to address public access and weed/rubbish/fire/pest/domestic pet control and submit to authorities for approval prior to its implementation.

The consortium also commits to implementing the approved EMP.

4.2.5 Evaluation

The proposed channel will be dredged through sedge habitat and will not affect the saltmarsh which is recognised as having significant environmental value. The sedge removed from the System 6 area will be replanted within the channel or nearby foreshore to the satisfaction of the Swan River Trust.

The proponent has committed to replacing the area of System 6 foreshore being dredged so that there will be a threefold increase in the habitat compared to that lost through dredging.

The proposal would result in the tip being upgraded for public use and access to the System 6 areas being managed via boardwalks.

The Environmental Protection Authority concludes that the proponent's commitments are considered adequate to achieve environmental acceptability.

4.3 Management and monitoring of leachate from tip site

4.3.1 Objective

To ensure that leachate from the former tip site do not result in a decline in water quality in the river and waterway or affect the environmental values of the river.

4.3.2 Evaluation framework

Existing policy framework

The Draft Swan and Canning Rivers Environmental Protection Policy is being prepared to protect the water quality necessary to support the multiple and diverse beneficial uses/environmental values of the waterway.

Water quality within the Swan River should comply with WA Guidelines for Fresh and Marine Waters. (Section 4.5 below outlines the evaluation framework used for water quality during dredging and construction of the channel).

Technical information

Decomposing rubbish within tips generates a liquid mixture of decomposition products known as leachate. The level of nitrogen as ammonia in particular can be used as an indicator of leachate pollution in environments in proximity to landfills.

The Swan River Trust has advised that monitoring indicates that leachates from the tip have declined to a low level over the last fifteen years since the closure of the tip.

In 1981, eleven cored boreholes were constructed by the then Public Works Department around the tip to determine whether nutrient leaching to the river was evident. The data indicate that, at the time of sampling, the ammonia nitrogen levels were high (between 0.63 to 120 mg/l).

Groundwater tests using the boreholes were conducted around the tip by the Swan River Management Authority and Swan River Trust in 1981, 1982, 1993 and 1995 and it was concluded that leachate levels within the tip were declining. The results for the eleven elements tested in 1993 and 1995 are contained in Appendix 6.

Further groundwater tests were conducted in 1994 by CMPS & F (refer Appendix 7), on behalf of the proponent, for petroleum hydrocarbons, polycyclic aromatic hydrocarbons, polychlorinated biphenyls, organochlorine pesticides and heavy metals. The tests detected traces of a number of contaminants and highlighted the presence of dieldrin on the site. The presence of dieldrin is indicative of regional dieldrin contamination both in the river and groundwater.

The Swan River Trust has advised that there is insufficient knowledge of the groundwater hydrology in the area to determine the dilution rate or the potential impact on the river of the contaminants that have been detected in the groundwater tests.

Comments from key government agencies

The City of Belmont has advised that the former tip site was only legally used for the disposal of domestic waste.

The Swan River Trust has advised that:

- details of the clay capping are to be submitted to the Trust; and
- a leachate monitoring programme is to be prepared by the proponent.

4.3.3 Public submissions

A number of submissions were concerned that there may be industrial wastes in the tip resulting from illegal dumping which may leach into the river via the channel as a result of the tip being disturbed by recent earthworks.

4.3.4 Response from proponent

Disturbance to the tip will be minimal. The edge of the tip will be recontoured to accommodate the Water Authority's floodway requirements and to improve visual amenity.

The southern channel will cut through the southern end of the tip. It is proposed that a impermeable barrier comprising of a clay lining will be provided at the water's edge to reduce the risk of leachates entering the river. The results of testing do not indicate that industrial wastes are leaching into the river.

Commitment

The proponent has committed to preparing an EMP for construction of the channel through the southern end of the tip site and submit it to the SRT and DEP for approval prior to construction of channel. The EMP is to include the following commitments:

- install clay-lined seal on tip side of channel;
- monitor for leachates in channel over period of six months after completion;
- incorporate channel in waterways monitoring programme for leachates from the tip; and
- develop contingency plan in association with SRT/DEP and Geological Survey (GSWA) in event of leachates being detected at significant levels.

The consortium has committed to implementing the approved EMP.

4.3.5 Evaluation

The Environmental Protection Authority concludes that the decreasing level of leachate from the tip together with the successful implementation of commitments made by the proponent ensure the risk of leachate adversely affecting the river environment has been reduced to an acceptable level.

The Environmental Protection Authority concludes that the proponent's commitments are considered adequate to achieve environmental acceptability.

4.4 Management of Central Belmont Main Drain

4.4.1 Objective

To ensure that water quality in the Central Belmont Main Drain is maintained or improved so that the environmental values of the river are protected.

4.4.2 Evaluation framework

Existing policy framework

The objectives of the Draft Swan and Canning Rivers Environmental Protection Policy are:

- to maintain or improve water quality in the river; and
- to achieve and maintain discharges of nutrients in amounts which do not create growths of aquatic life at populations or frequencies that impair the environmental values of the waterway.

Technical information

The State government has adopted Integrated Catchment Management (ICM) as an appropriate vehicle to improve water quality from urban drains such as the Central Belmont Main Drain. An integrated response is required because the community and a range of agencies have control over factors that directly or indirectly influence water quality and amenity of the drain. For example the catchment of the drain includes horse stables and wash down areas at the Western

Australian Turf Club, and consequently the runoff collected by the drain can carry high concentrations of faecal coliforms. Local authority drainage works flow into drainage infrastructure managed by the Water Authority.

The Central Belmont Main Drain Remediation Working Party propose to introduce Integrated Catchment Management and expect an emphasis to be on improving wastewater management techniques in the locality.

The outlet of the Central Belmont Main Drain is presently located at the proposed southern entrance to the channel. The proponent proposes move the drain 250m downstream and to contribute to improvement of the drain's water quality and aesthetics by adding landscaped retention basins to reduce the risk of contaminants entering the channel. The proponent also intends to use Water Sensitive Design techniques to manage stormwater quality leaving the residential portion of the site.

The proponent considers that the retention basins will have a nutrient 'polishing' rather than a nutrient stripping function.

The term nutrient 'polishing' is used by the proponent to indicate that the size and retention time of the basins only provides for nutrients bound to large particulates to be removed by the basins. In contrast, nutrient stripping ponds are sized to settle out most of the particulate nutrients (i.e. particulates 0.45 μm diameter and greater) and incorporate mechanisms for removal of dissolved nutrients.

Detailed negotiations are in progress between the City of Belmont, Western Australian Planning Commission and the Water Authority on the final design requirements on the proposed modifications to the drain.

Comments from key government agencies

The Cental Belmont Main Drain is to be redesigned to the satisfaction of the Swan River Trust and the Water Authority.

The Water Authority has advised that design plans for any proposed alterations to the Central Belmont Main Drain will have to be submitted for approval prior to construction.

4.4.3 Public submissions

One submission noted that the Central Belmont Main Drain should not be used to justify dredging the channel and should be upgraded independently of the Ascot Waters project.

4.4.4 Response from proponent

The proposed upgrading of the Central Belmont Main Drain is considered by the proponent to be a considerable net benefit to the river.

Commitment

- The Consortium will remediate the Central Belmont Main Drain (CBMD) and its outlet in accordance with the proposals set out in the PER or any alternative improved arrangement mutually acceptable to the Consortium and the relevant authorities and with the approval of detailed working drawings by the Water Authority of Western Australia (WAWA) and City of Belmont.

- Initial management (for the first 12 months) of the landscaped components of the modified CBMD will be undertaken by the Consortium, following which management will revert to the City of Belmont/WAWA.

4.4.5 Evaluation

It is considered that the proponent's proposals for the CBMD are consistent with the responsibilities which would be expected of the proponent in the context of Integrated Catchment Management. It is expected that the proponent's proposals and commitments for Stage 1 and those outlined in the PER would result in stormwater of an acceptable quality entering the drain, the amenity of the drain being improved and would contribute to an improvement of drain water quality prior to its discharge to the Swan River. On this basis, the Environmental Protection Authority concludes that the proponent's commitments are adequate to meet the objective and no specific recommendation by the EPA is required.

4.5 Management of waterways and water quality

4.5.1 Objectives

- To ensure that water quality in the proposed channel system is maintained or improved over the long term and is consistent with water quality in the Swan River, so that the beneficial uses/environmental values are protected.

- To maintain the capacity of the channel to flush as efficiently as originally designed.

4.5.2 Evaluation framework

Existing policy framework

The Western Australian Planning Commission' s Policy DC 1.8 - Procedures for Approval of Artificial Waterways and Canal Estates, outlines minimum provisions within canal estates for a range of topics, including water quality. The policy states that the attainment and maintenance of acceptable water quality will require active management.

Parameters regarded as being significant for assessing water quality include suspended solids, chemical constituents, pH, dissolved oxygen, bacteriological counts and nutrients. The WA Guidelines for Fresh and Marine Waters set water quality parameters according to the beneficial uses of the waterway.

Several specific policies have been developed by the Swan River Trust to manage potential sources of water quality problems during construction. These include the Dredging Policy DE 1 and the Dewatering Policy DE 6 which were developed to ensure that water quality is protected during construction.

The Planning and Management Guidelines for Water Sensitive Urban Design prepared for the Department of Planning and Urban Development, the Water Authority of Western Australia and the Environmental Protection Authority provide an approach for integrated land use planning/water resource management to achieve water sensitive design objectives.

Technical information

The design of the proposed channel is based on the Ascot Waters Water Quality Siltation and Dredging Study. A Technical Review Group established to examine the model has concluded that the channel is designed to flush adequately to maintain appropriate water quality standards. Members of the Technical Review Group included hydrological engineers from the Water Authority, Swan River Trust and the Department of Transport.

Flushing time has been calculated on tidal exchange. There is a significant tidal flow of water into and out of this section of the river during summer and late autumn which is the most critical time for adequate flushing conditions. The effectiveness of diverting some of the flow through the proposed channel was examined using a hydraulic - based model. The model was based

solely on the conservation of mass and used the tidal signal at the downstream end of the development as the only driving force.

The model indicates that during the flooding spring tides about half (70,000m3) of the volume of the waterway will be replaced. This is a very significant exchange of water between the river and the proposed channel. During the neap tides the exchange of water is less (45,000m3) although still considered to be a significant exchange of water. The neap tides only last for a few days.

The model indicates that the residence time in the channel will vary from:

- one day or less under good flushing conditions (winter);
- 2 - 3 days under poor flushing conditions (late summer to early autumn).

Water mixing and exchange will also occur in the channel as a result of currents caused by wind.

Comments from key government agencies

The Swan River Trust has advised that the:

- long term waterways manager is to be identified and clearly defined in a deed of agreement;
- channel should be managed in accordance with the Western Australian Planning Commission Canal Policy DC 1.8; and
- proponent is to prepare and submit a waterways management programme.

The Western Australian Planning Commission is liaising with a number of Government agencies in regard to the future management of the channel after 5 years.

4.5.3 Public submissions

One of the submissions was concerned that the river would not flush properly and the water quality and environment of the Swan River would be adversely affected.

4.5.4 Response from proponent

Commitment

Waterway management in the short term (first five years) will be the responsibility of the Consortium. The Consortium will prepare an EMP for the monitoring and management of the waterways and submit it to appropriate authorities for approval prior to implementation.
The EMP is to include commitments for the following:

- investigation of water exchange characteristics;
- investigation of effects of significant algal blooms;
- regular monitoring (quarterly) of indicator water quality parameters;
- monitoring of benthic recolonisation;
- monitoring success of wetland vegetation establishment around foreshore;
- bathymetric monitoring of channel sedimentation in spring;
- monitoring of navigable depth, structural integrity of walls and beacons;
- annual reporting of findings of above;
- implementation of contingency plans in the event that water quality declines to levels unacceptable for indirect recreational use (boating) and maintenance of the waterway ecosystem;
- monitoring and removal of rubbish;
- management plan for marina;

- maintenance of flushing capacity to original design standards as specified in the PER;
- commitments for long-term management of waterways to be finalised once the consortium confirm acceptance of approval conditions of PER; and
- The consortium commitment to implementing the approved EMP.

4.5.5 Evaluation

The Technical Review Group established to examine the Ascot Waters Water Quality Siltation and Dredging Study has concluded that the channel is designed to flush and maintain appropriate water quality standards.

The Consortium has committed to preparing an EMP for the monitoring and management of the waterways for the first five years. The EMP will include quarterly monitoring of indicator water quality parameters and should include depleted oxygen and algal counts.

The Environmental Protection Authority has concluded that the proponent's commitments are adequate to meet the objectives of maintaining water quality in the channel so that the beneficial uses/environmental values are protected and the capacity of the channel to flush.

However, the Environmental Protection Authority considers that an audit report on environmental management performance should be prepared by the proponent and submitted to the Environmental Protection Authority at least six months prior to the proposed handover of management responsibility of the waterway to the State. The purpose of this is to ensure that predicted environmental impacts and their management have not resulted in unacceptable environmental impacts on the Swan River as a consequence of construction and operation of the project. Accordingly the Environmental Protection Authority recommends that:

Recommendation

At least 6 months prior to the date of handover of the management responsibility of the waterway to the State, the proponent shall submit a report to the Environmental Protection Authority which addresses the following environmental performance measurements:

- **water quality and channel flushing characteristics; and**
- **a strategy for the future management of the channel.**

4.6 Contingency plans required in the event that water quality in the channel declines.

4.6.1 Objective

To ensure that a contingency plan is in place to remediate a decline in water quality in the proposed channel so that the beneficial uses/environmental values of the river are protected.

4.6.2 Evaluation framework

Existing policy framework

Refer to Section 4.5.2 above.

Technical information

The two key concerns regarding water quality decline are that water in the channels could become stratified leading to 'turnover' where anoxic (oxygen depleted) malodourus water from

the bottom rises to the surface, or that additional nutrient inputs to the channel area are sufficient to promote algal bloom conditions when they are not occurring elsewhere in the river.

The EMP which will include a waterways monitoring programme (refer to Appendix 8 - Commitment 11), should provide a general indication of the water quality in the channels. A monthly or weekly monitoring program would yield a large quantity of data, but would not be able to provide information which could be used to predict the likelihood of significant water quality decline (as described in the above paragraph). A daily inspection would provide information as to the frequency of water quality decline, and this could then be used as a basis for management and a monitoring programme targeted to periods when water quality decline is immanent.

Comments from key government agencies

The Swan River Trust advise that contingency plans are to be prepared demonstrating that a significant decline in water quality can be managed.

4.6.3 Public submissions

One of the submissions stated that the channel would impose on-going management costs on the community.

4.6.4 Response from proponent

Commitments

A contingency plan will be prepared by the proponent to specify the remedial measures to be undertaken in the event of:

- malodours caused by stratification and anoxia in the water channels; and
- floating algal scum caused by significant algae bloom due to nutrient input from the channels.

The proponent has advised that the following contingency measures could be implemented in the event of malodours or algae occurring:

- Malodours - install a bubble curtain oxygenator to oxygenate and mix the waterbody to overcome anoxia; and
- Algae - confined by booms, retrieved by an oil skimmer.

The consortium also commits to implementing the approved contingency plan if required.

4.6.5 Evaluation

It is considered that the contingency plan to be prepared by the proponent will ensure that water quality in the proposed channel is acceptable over the long term.

The Environmental Protection Authority concludes that the proponent's commitments are adequate to meet the objective and no specific recommendation by the EPA is required.

4.7 Mosquitoes

4.7.1 Objective

To control the breeding of mosquitoes without adversely affecting other flora and fauna.

4.7.2 Evaluation framework

Existing policy framework

The Environmental Protection Authority's policy requires a minimum buffer width of 50 metres between waterbodies and residential areas.

Comments from key government agencies

The Health Department of Western Australia and the Swan River Trust were concerned at the proximity of the proposed residential development to the breeding areas of two species of mosquitoes.

The Health Department advised that the communications tower situated in the System 6 saltmarsh has severely disrupted water flow in the area. In addition copper radial wires have created depressions providing ideal areas for mosquito breeding.

The Health Department and Swan River Trust both recommended that a mosquito control strategy be prepared as a condition of approval. The Health Department recommended physical modifications to the site in the form of spot filling.

4.7.3 Public submissions

Residential development is likely to increase the use of chemicals to control mosquitos which would adversely affect the waterbirds.

4.7.4 Response from proponent

Commitments

The proponent is committed to preparing a physical mosquito control strategy in conjunction with the City of Belmont and the Health Department, and submit to the SRT/DEP for approval prior to implementation.

To implement approved mosquito control strategy including:

- construction works;
- monitoring result of works;
- reporting details of completed works and monitoring results.

4.7.5 Evaluation

The proponent's commitments to prepare and implement a physical mosquito control strategy to the satisfaction of the Health Department and the City of Belmont will greatly assist controlling mosquito breeding.

The Environmental Protection Authority concludes that the commitments are adequate to assist in the control of mosquito breeding.

5. Conclusions and recommendations

The Environmental Protection Authority concludes that the proposal by the Western Australian Planning Commission and the City of Belmont to dredge two channels to connect an artificial wetland with the Swan River at Ascot Waters is environmentally acceptable subject to implementation of the proponent's revised commitments and the Environmental Protection

Authority recommendations. The commitments satisfy the Environmental Protection Authority's objectives for the issues raised.

In considering the acceptability of the proposal the Environmental Protection Authority concluded that the proposal would be a net benefit to the river. The proposal involves upgrading a former tip site located on public land for use as a public recreation area. The proposal also provides replacement wetlands and river environment well in excess of the area disturbed by dredging and improves the quality of water entering the Swan River from the Central Belmont Main Drain.

In reaching this conclusion, the Environmental Protection Authority identified the main environmental issues requiring consideration as:

Biophysical

- acceptability of dredging on the Swan (during dredging);
- impact on System 6 - loss of habitat;

Pollution

- management and monitoring of leachate from tip site;
- management of Central Belmont Main Drain;
- management of waterways and water quality;
- contingency plans required in the event that water quality in the channel declines;

Social Surroundings

- mosquitoes

Table 2 provides a summary of the Environmental Protection Authority's position on these issues.

The proponent's commitments are set out in Appendix 8. The Environmental Protection Authority considers that the proponent should be required to implement all of the commitments. The Department of Environmental Protection should audit all the commitments except for commitment 21.

The Environmental Protection Authority is satisfied that based on the information currently available, it is appropriate to submit the following recommendations to the Minister for the Environment.

Recommendation 1

The proposal to dredge two channels to connect an artificial wetland with the Swan River at Ascot Waters is environmentally acceptable and the Environmental Protection Authority recommends that it could proceed subject to the successful implementation of the proponent's commitments and recommendation 2.

Recommendation 2

At least 6 months prior to the date of handover of the management responsibility of the waterway to the State, the proponent be required to submit a report to the Environmental Protection Authority which addresses the following environmental performance measurements:

- **water quality and channel flushing characteristics; and**
- **a strategy for the future management of the channel.**

The proponent has committed to preparing a number of environmental management plans. The Environmental Protection Authority has requested that the proponent prepare one environmental

management plan covering all of the commitments. The Environmental Protection Authority has also requested that the proponent develop and include within the environmental management plan quantifiable and auditable performance indicators.

6. Recommended environmental conditions

Based on the assessment of this proposal and the recommendations in this report, the Environmental Protection Authority considers that the following Recommended Environmental Conditions are appropriate for the proposal:

ASCOT WATERS - PROPOSAL TO DREDGE TWO CHANNELS TO CONNECT AN ARTIFICIAL WETLAND WITH THE SWAN RIVER.

WESTERN AUSTRALIAN PLANNING COMMISSION

AND

THE CITY OF BELMONT

1 Proponent Commitments

The proponent has made a number of environmental management commitments in order to protect the environment.

1-1 In implementing the proposal, the proponent shall fulfil the commitments made in the Public Environmental Review, and in response to issues raised following public submissions; provided that the commitments are not inconsistent with the conditions or procedures contained in this statement.

A schedule of environmental management commitments to be audited by the Department of Environmental Protection was published in Environmental Protection Authority Bulletin 797 and a copy is attached.

2 Implementation

Changes to the proposal which are not substantial may be carried out with the approval of the Minister for the Environment.

2-1 Subject to these conditions, the manner of detailed implementation of the proposal shall conform in substance with that set out in any designs, specifications, plans or other technical material submitted by the proponent to the Environmental Protection Authority with the proposal.

2-2 Where, in the course of the detailed implementation referred to in condition 2-1, the proponent seeks to change the designs, specifications, plans or other technical material submitted to the Environmental Protection Authority in any way that the Minister for the Environment determines, on the advice of the Environmental Protection Authority, is not substantial, those changes may be effected.

3 Proponent

These conditions legally apply to the nominated proponent.

3-1 No transfer of ownership, control or management of the project which would give rise to a need for the replacement of the proponent shall take place until the Minister for the Environment has advised the proponent that approval has been given for the nomination of a replacement proponent. Any request for the exercise of that power of the Minister shall be accompanied by a copy of this statement endorsed with an undertaking by the

proposed replacement proponent to carry out the project in accordance with the conditions and procedures set out in the statement.

4 Future Management

4-1 At least 6 months prior to the date of handover of the management responsibility of the waterway to the Crown, the proponent shall submit a report to the Environmental Protection Authority which addresses the following:

1. water quality and channel flushing characteristics; and
2. a strategy for the future management of the channel.

5 Time Limit on Approval

The environmental approval for the proposal is limited.

5-1 If the proponent has not substantially commenced the project within five years of the date of this statement, then the approval to implement the proposal as granted in this statement shall lapse and be void. The Minister for the Environment shall determine any question as to whether the project has been substantially commenced.

Any application to extend the period of five years referred to in this condition shall be made before the expiration of that period to the Minister for the Environment.

Where the proponent demonstrates to the requirements of the Minister for the Environment on advice of the Department of Environmental Protection that the environmental parameters of the proposal have not changed significantly, then the Minister may grant an extension not exceeding five years.

6 Compliance Auditing

To help determine environmental performance, periodic reports on progress in implementation of the proposal are required.

6-1 The proponent shall submit periodic Progress and Compliance Reports, in accordance with an audit programme prepared by the Department of Environmental Protection in consultation with the proponent.

Procedure

1 Unless otherwise specified, the Department of Environmental Protection is responsible for assessing compliance with the conditions contained in this statement and for issuing formal clearance of conditions.

2 Where compliance with any condition is in dispute, the matter will be determined by the Minister for the Environment.

7. References

Department of Conservation and Environment (1983). *Conservation Reserves for Western Australia as recommended by the Environmental Protection Authority. The Darling System - System 6. Part II: Recommendations for Specific Localities. Report 13.* Department of Conservation and Environment. Perth, WA.

Department of Planning and Urban Development (1991). *Ascot Fields Environmental Assessment.* A & S R Tingay Pty Ltd and Halpern Glick Maunsell Pty Ltd. Perth, WA.

Environmental Protection Authority (1995). *Draft Swan and Canning Rivers Environmental Protection Policy.* Environmental Protection Authority . Perth, WA.

Environmental Protection Authority (1993), *Environmental Impact Assessment Administrative Procedures,* Environmental Protection Authority. Perth, WA.

Environmental Protection Authority (1992). *Environmental Protection (Swan Coastal Plain Lakes) Policy Approval Order (1992),* Government Gazette 18 December 1992. Perth, WA.

Environmental Protection Authority (1991). Riverside Gardens (West) dredging and landfill, King William Street, Bayswater. Environmental Protection Authority. Bulletin 575. Perth, WA.

Environmental Protection Authority (1992). *Guidance Notes from Environmental Protection Authority reports 1971 - 1992, Western Australia..* Environmental Protection Authority. Bulletin 625. Perth, WA.

Environmental Protection Authority (1995). *Proposal to dredge a portion of the Swan River and foreshore to provide access to private boathousing, Mosman Park.* Bulletin 775. Environmental Protection Authority. Perth, WA.

Environmental Protection Authority (1993). *Strategy for the Protection of Lakes and Wetlands of the Swan Coastal Plain. Report of the Environmental Protection Authority,* Environmental Protection Authority. Bulletin 685. Perth, WA.

Environmental Protection Authority (1993). *Western Australian Water Quality Guidelines for Fresh and Marine Waters.* Environmental Protection Authority. Perth, WA.

Rogers, M P and Associates Pty Ltd (1995). *Ascot Waters - Water Quality and Flushing.*

Perth, WA.

Swan River Trust (1993). *Policy DE 1 Dredging and DE 6 Dewatering.* Swan River Trust. Perth, WA.

Western Australian Planning Committee. *Policy DC 1.8 Procedures for Approval of Artificial Waterways and Canal Estates.*Western Australian Planning Commission. Perth, WA.

Appendix 1

(1a) Level of assessment set by the Environmental Protection Authority for Stage 1.

(1b) Letter providing Informal Advice

Appendix 1a

AN ENVIRONMENT WORTH PROTECTION

Secretary
State Planning Commission
469-489 Wellington Street
PERTH WA 6000

Your ref: 833-2-15-11
Our ref: 70219
Enquiries: Garry Middle

Attention: Mrs A Boland

PROPOSAL: **MRS Scheme Amdt No 945/33A to rezone land**
LOCATION: **west of Grandstand Road and north of Great Eastern Highway, Ascot**
PROPONENT: **State Planning Commission**
ASSESSMENT: **Informal review with public advice**

Thank you for your letter referring the above matter to the Environmental Protection Authority.

This proposal raises a number of environmental issues, some of which you mention in your letter. However, the overall environmental impact of the proposal is not so severe as to require formal assessment by the Authority, and the subsequent setting of formal conditions by the Minister for the Environment.

Nevertheless, the staff of the Authority will look at the proposal, taking into account the points raised in your letter. They will provide advice to you and relevant decision-making authorities on the environmental aspects of the proposal. That advice will be forwarded as soon as possible, and will be made available to the public.

Some members of the public may have preferred that the Authority undertake a formal assessment of the proposal. By law they have a 14-day period, closing Friday, 17 December 1993, during which, on payment of the $10 appeal fee, they may ask the Minister for the Environment to consider directing the Authority to conduct a formal assessment.

The Environmental Protection Act requires that no decision should be made to allow or implement this proposal until after the appeal period has closed and any appeals received have been determined.

Please contact the Minister for the Environment's office on 321-2222 after the closing date of appeals to check whether any appeals against level of assessment were received.

R A D Sippe
DIRECTOR
EVALUATION DIVISION

6 DEC 1993

Subject to the above advice and comments, the proposed rezoning would be environmental acceptable. Should you require further information regarding these matters please contact Garry Middle on (09) 222 7103.

Yours sincerely

R A D Sippe
DIRECTOR
EVALUATION DIVISION

10 March 1994

CC: City of Belmont
Bayswater Greenwork INC

Grandstand SPC 100394

Attachment 2 **Appendix 1b**

Department of Environmental Protection

AN ENVIRONMENT WORTH PROTECTION

Secretary
State Planning Commission
469-489 Wellington Street
PERTH WA 6000

Your ref:
Our ref: 833-2-15-11
Enquiries 93.57:70219
Garry Middle
222 7103

ATTENTION: Mrs A Boland

METROPOLITAN REGION SCHEME AMENDMENT NO 945/33A - GRANDSTAND ROAD, ASCOT, CITY OF BELMONT

I refer to your memo dated October 15 1993 on the above proposed development and offer the following advice and comment.

Disposal of waste
Part of the site has been used for waste disposal, and the evidence to date suggests that the waste is inert with no hazardous materials having been disposed of on the site. The Health Department should be consulted prior to development of the site as approval is required under the Health Act where a former waste disposal site is involved.

Adjacent System Six area
The site is adjacent to System Six area M51. Residential development on this site will increase the potential impacts on the river foreshore through increased recreation. The City of Belmont should liaise with the Department of Planning and Urban Development to prepare and implement a management plan for the System Six area. Public open space areas could be located adjacent to the reserve to provide a buffer between the residential areas and the foreshore reserve.

Claypits
There are some claypits either within the site or adjacent to it. The environmental value of these claypits can be summarised as follows. They are not within System Six, they are not protected by the Environmental Protection (Swan Coastal Plain Lakes) Policy 1992, and are only of moderate importance for waterbirds based on the data from Storey *et al.* (Volume 7 of the series "Wetlands of the Swan Coastal Plain" entitled *Waterbird Usage of Wetlands on the Swan Coastal Plain*). Further, the claypits and surrounding upland are degraded and have limited value for wildlife.

Notwithstanding this, the claypits provide a useful complementary wildlife habitat to the wetlands associated with the estuary, and are worthy of conservation within public open space.

3.0 **System 6 (M51)**

3.1 Modification of the System 6 saltmarsh (dredging) will not benefit the environment.

3.2 Public access should not be provided to the System 6 areas as it will result in the degradation of the environment.

3.3 The proposed modifications may not be able to maintain the salt/fresh regime to retain the saltmarsh community.

3.4 The land replacing the dredged System 6 area will not have the same salt water regime and seasonal inundation requirements needed for saltwater communities.

4.0 **Existing Lakes**

4.1 The PER under values the site as a water bird habitat.

4.2 The shallow seasonal nature of the lakes should have been retained.

4.3 The wetlands are in Category C. The management objectives will not be achieved.

Pollution

5.0 **Belmont Tip Site**

5.1 Management plans should have been prepared prior to disturbance of the site.

5.2 The PER does not provide sufficient detail on the history or current condition of the tip.

5.3 The current earthworks should have been subject to a PER.

5.4 Leachates from the tip could be a risk to the river and groundwater.

6.0 **Central Belmont Main Drain (CBMD)**

61 Measures to improve the drain should be implemented separately and should not be tied to a project that is detrimental to the river.

6.2 New wet detention basins should be located on the Mathieson Road drain and not on the realigned CBMD.

Social Impacts

7.0 **Mosquitoes**

7.1 People should not live and recreate in an area that is a known mosquito breeding area.

7.2 Residential development is likely to increase the use of chemicals to control mosqitoes which will be harmful to waterbirds.

7.3 The proposal is not supported by the SRT until a mosquito control strategy is developed.

7.4 The Ascot Waters project provides the ideal opportunity to implement runnelling and spot filling.(Health).

7.5 The developers should be obliged to conduct a 10cm contour survey of the entire saltmarsh.

7.6 Inform all prospective buyers of property in the Ascot Waters development in writing of the mosquito nuisance and associated health risk.

8.0 Miscellaneous

8.1 The open space created on the tip site will not benefit wildlife.

8.2 Fertiliser and pesticides used on the open space will contribute to pollution in the river.

8.3 Argentine ant treatments may have contaminated the site.

8.4 The bicycle route along the north and east sides of the development should remain open during construction

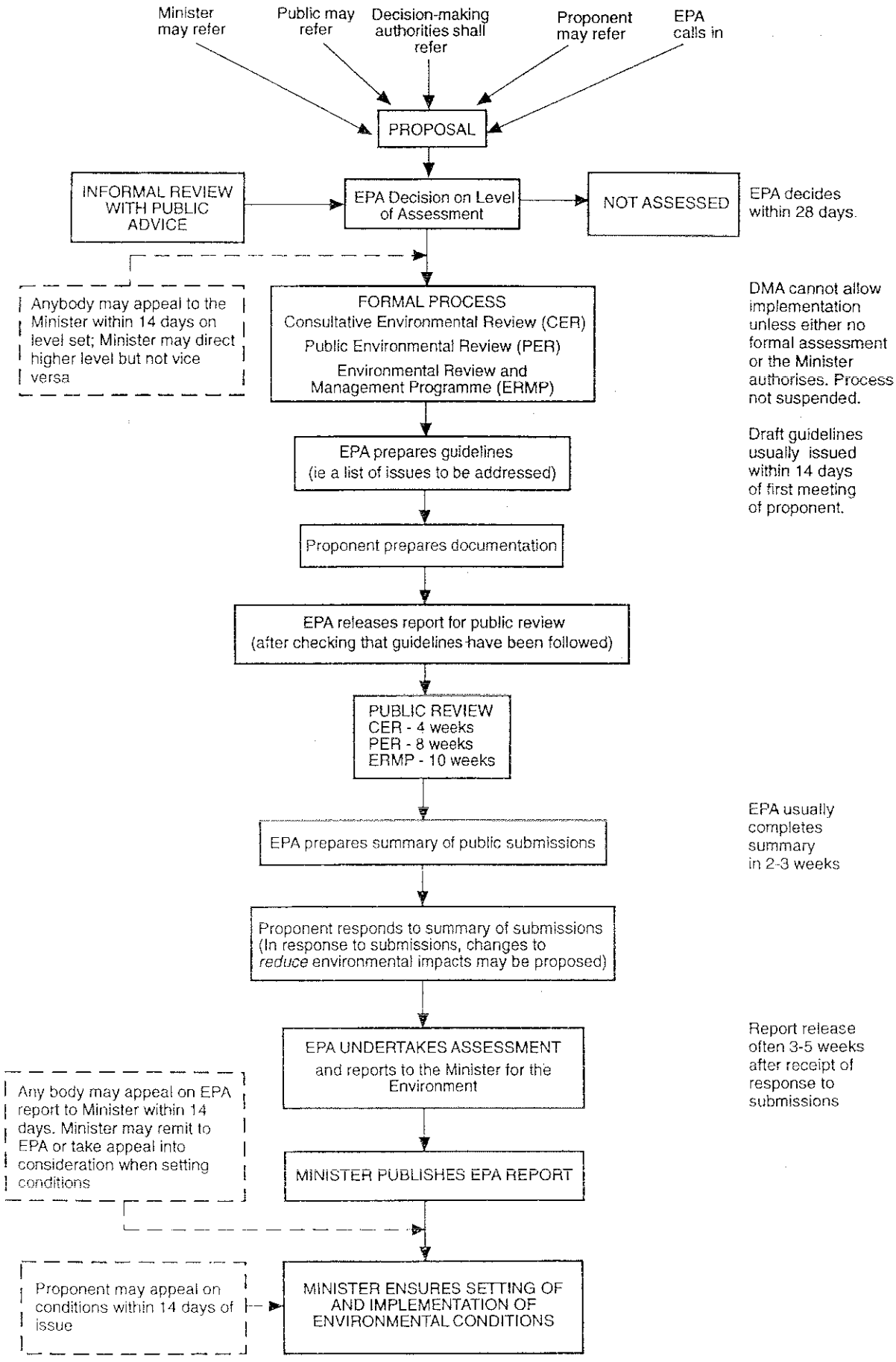
8.5 The existing dual path along the south side of Resolution Drive should be retained for through journeys.

8.6 Risk of groundwater contamination from the proposed residential development.

Appendix 2

Environmental impact assessment flow chart

EIA PROCESS FLOW CHART



Appendix 3

List of responses received to the PER

Appendix 3

List of Submitters

1. Conservation Council of WA
2. Swan River Trust
3. Water Authority of Western Australia
4. Kevin McLean
5. Maylands Ratepayers and Residents Association
6. Bicycle Transportation Alliance
7. Waterbird Conservation Group Inc
8. Health Department of Western Australia
9. Ministry for Planning

Appendix 4

Issues raised by general public, government agencies and conservation groups

Appendix 4

ISSUES RAISED BY GENERAL PUBLIC, GOVERNMENT AGENCIES AND CONSERVATION GROUPS.

Physical and Biological Impacts

1.0 Creation of the Channel

1.1 The PER is misleading and gives a false impression of the environmental benefits of the channel.

1.2 The proposal will not be a net benefit to the river. Construction of the canal is not the best environmental outcome.

1.3 Dredging has been one of the reasons for the decline of the rivers health.

1.4 The depth contours of the channel will not have the same ecological function as the existing seasonal lakes.

1.5 Changing a seasonal fresh to brackish wetland into a estuarine canal is not enhancing the environment as claimed in the PER.

1.6 Seasonal wetlands have immense value. Creating permanent water bodies is not necessarily an improvement to seasonal wetlands.

1.7 The channel will interference with the natural river course and foreshore.

1.8 On-going dredging will cause destruction to marine life.

1.9 A bridge across the channel rather than an cause is preferred. (SRT)

1.10 Shallow water habitats will be lost as a result of dredging and deepening to favour motor boats.

1.11 Making provision for boats within the canal is not consistent with environmental restoration

1.12 Increased boating activity associated with the marina will impact adversely on the river environment

1.13 There is a risk to the channel and river environment if the channel does not flush properly.

1.14 The channel should be designed to maximise bird habitats.

2.0 Management and Contingency Plans

2.1 The proposal will have on-going costs which will become a burden to the community.

2.2 The proposal is not supported until a Long Term Waterways Manager/s to be identified and clearly defined in a Deed of Agreement.(SRT)

2.3 Regular maintenance dredging of the new artificial waterway will be required to remove accumulated silt deposits.

2.4 The proponent should be responsible for managing M51.

2.5 The proposal is not supported until a contingency plans are prepared and included in a Deed of Agreement.(SRT)

2.6 Silt curtains are to be used at the dredge site and at the outfall of the settling basin.

2.7 The monitoring programme should include analysis for heavy metals, pesticides and other pollutants.

Appendix 5

Proponent's response to issues raised

(Attachment A — discussion of main issues)

Appendix 5

RESPONSE TO ISSUES RAISED

1 CREATION OF THE CHANNEL

INITIAL COMMENT:

'Creation of the channel' is taken in this instance to refer to the connecting channels themselves, and not necessarily the internal wetland body. An issue of semantics is involved here. If the 'approved' waterbody was not to be connected to the Swan River it would not be referred to as a channel, and it would have been a permanent freshwater/brackish wetland. No seasonal wetland was ever intended for the development; a permanent wetland is the plan supported and previously approved by the EPA.

It is not the responsibility of the Proponent to argue the merits of an already approved EPA development strategy for the site.

1.1 The PER is misleading giving a false impression of the environmental benefits of the channel

This statement is not justified by reasoning. Hence it is difficult to answer other than to restate the proponent's case which is already presented in the PER, and to elaborate as follows.

First, there are two channels not one (i.e. one smaller upstream and one larger downstream), and both are different in form and function. Second, the PER in no way attempts to obscure the fact that the primary functions of the channels are to:

- make a connection between the internal waterbody and Swan River;
- allow adequate flushing of the new waterbody; and
- allow a functional connection (limited navigation) via ONE channel (ie the downstream channel).

Nevertheless the PER is equally clear that the upstream channel (in particular) is designed to provide a maximum degree of environmental benefit. This is not a misleading claim, it is a fact; the design of the upstream channel (i.e. depth, contours, related braided channels, intended vegetated littoral zones etc) deliberately incorporates features intended to provide environmental value.

1.2 The proposal will not be a net benefit to the river. Construction of the canal is not the best environmental outcome.

The Development Consortium has gone to great lengths to design a project incorporating independent advice which will be of benefit not only to the Swan River ecosystem (by returning flood plain wetlands and shallow fish nursery areas to the river), but also to the community through provision of the additional amenity of river contact and recreation opportunities.

These considerable benefits will not be realised if the channels are not constructed to connect the existing man-made lake to the river. Other benefits which would not arise include:

- a net improvement of the Belmont Main Drain; and
- attention to preparation of appropriate management programmes for the mosquito breeding problem on the System Six saltflats.

If the channels are not constructed, the outcome will be yet another man-made lake which will require ongoing management and maintenance, and provide little opportunity for other than passive recreation (bird watching).

1.3 Dredging has been one of the reasons for the decline of the river's health.

Past poorly managed dredging activities have contributed to the decline of the Swan River and this is recognised. However, the reasons for the current decline in the river's health are many and varied, and relate to inappropriate land management and fertilizer application practices in the upper catchment, loss of fringing vegetation by inappropriate landfill and accumulation of nutrients in sediments held in deep pockets of the river, some of which were created by inappropriate dredging.

The dredging activities proposed are to create shallow channels for purposes of flushing and water exchange and, in the case of the southern channel, navigation. Because of the flushing action of water movement and boating, and the design of the waterway to ensure a consistent shallow gradient is maintained from the north channel through to the south channel, all modelling of the system indicates that the dredged channels will not cause any decline in the river's health.

Selective dredging is in fact one of the proposed solutions to the river's health problems which is currently being investigated by government authorities.

1.4 The depth contours of the channel will not have the same ecological function as the existing seasonal lakes.

Neither of the two channels (of different depth and width) will have the same function as existing seasonal lakes, nor were they ever intended to. They will nevertheless have ecological function, albeit different. Seasonal wetlands have a particular value to waterbirds as a result of the rich benthic fauna, whilst the permanent open water bodies of the channels at 1 metre and 2.5 metres depth will be of value to fish and diving birds at the very least. It is to be noted that the PER carefully describes the internal new waterbody as having very shallow depths (possibly exposed at low tides) along much of its western shoreline, and this is deliberately to provide feeding grounds for wading birds; the main **waterbird** habitat value of all seasonal wetlands.

1.5 Changing Seasonal fresh to brackish wetland into an estuarine canal is not enhancing the environment as claimed in the PER.

This largely depends on one's position and preference as to the weighting given to the proposed riverine wetland compared with the previously degraded Ascot site. The proposal has promoted throughout the net gains arising from the environmental, engineering and landscape solutions inherent in the Ascot Waters development.

Creating a net far larger riverine wetland than the combined area of all previous wetlands must be considered an enhancement of this Ascot environment, particularly as the previous 'non wetland' components of the site were highly degraded.

1.6 Seasonal wetlands have immense value. Creating permanent water bodies is not necessarily an improvement to seasonal wetlands.

Some large natural seasonal lakes do provide immense waterfowl value. However, the value of small, man-made and degraded seasonal wetlands is debatable. The previous comments regarding the accepted strategy and approvals of the EPA also apply here.

Nevertheless, the criticism implied gives no recognition to the environmental value provided by creating permanent riverine wetland of the type indicated. Fishing enthusiasts and observers of estuarine waterbirds would disagree with those that favour observing waterbirds that frequent freshwater seasonal wetlands.

1.7 The channel will interfere with natural river course and foreshore.

The channels will of course 'cut through' the foreshore at the two locations indicated in the PER. The downstream channel entrance will transect the foreshore at the location of the existing Central Belmont Main Drain outlet; there is no case to be made that the channel will be as harmful as an existing drain structure.

The upstream channel will, as described in the PER, transect the foreshore where there is an existing man-made channel through the system 6 area. It will be deeper and wider, but it does not introduce a fundamentally different situation to that which exists already.

Interference with river processes (river flow and hydrodynamics) will occur at a minor level.

1.8 On-going dredging will cause destruction to marine life.

Dredging frequency is likely to be every 20 to 25 years within the waterway, with possible additional maintenance dredging for the northern channel alone following flood events which cause movement of the bed load sediments.

The act of dredging will remove benthic fauna living in the material to be dredged, at the time of dredging. However, disturbed benthos will recolonise rapidly with benthic fauna from the surrounding benthic habitat.

1.9 A bridge across the channel rather than a causeway is preferred.

It has always been the developer's intention to build a structure which in no way impedes flushing of water through the waterway. The Consortium is prepared to adopt a suitable design solution to meet the Swan River Trust's performance standards for a suitable crossing.

1.10 Shallow water habitats will be lost as a result of dredging and deepening to favour motor boats.

The design of the channels is primarily to ensure that the internal waterbody flushes adequately, not to accommodate motor boats. In fact the size of the motorboats will be limited by the depth and width of the southern channel and the height of the footbridge. As it happens this is largely a non-issue because the draft of most motor boats able to

pass under the causeway at Heirrison Island have very shallow drafts and will be able to use the downstream navigable channel of the Ascot Waters development.

As the PER repeatedly points out, the design of the overall waterbody deliberately seeks to create a range of depths from deeper (2.5 m maximum) to very shallow, including occasionally exposed margins at low tide. Overall there will be a significant area of shallow water habitat, especially in association with the braided channels, the islands and the western portion of the inner waterway upstream of the proposed causeway crossing.

1.11 Making provision for boats within the canal is not consistent with environmental restoration.

Motorised boats will only be permitted in the downstream third (approx) of the newly created waterbody, which due to the design morphology required to achieve flushing is necessarily the deepest part. Boats are able to use the rest of the Swan River so it is difficult to see why there is objection to limited boat access to a restricted area of the Ascot Waters waterbody.

1.12 Increased boat activity associated with the marina will impact adversely on the river environment.

Except that a new destination for boats using the upper reaches of the river will be created, we fail to see any justification for the assertion that 'increased boating activity' will impact adversely on the 'river environment'. Boating is a legitimate and encouraged activity on the Swan River, and given the position and operation of the Maylands Slipyard on the nearby Maylands foreshore within a reserve for Parks and Recreation this particular objection is neither valid nor credible.

1.13 There is a risk to the channel and river environment if the channel does not flush properly.

The channel and internal waterway is designed by competent professionals in their field and on that basis there is complete confidence that flushing will occur as predicted. In addition, the Swan River Trust has engaged an independent expert to assess the flushing model. The flushing predictions are supported by the independent expert.

The flushing calculations used are the same as those used to predict flushing in similar developments elsewhere (Mandurah), and which have been confirmed by site investigation subsequent to development completion.

1.14 The Channel should be designed to maximise bird habitats.

If the channel (in this instance) is taken to mean the entire new waterbody, including the connecting channels, the PER should clearly indicate that design to maximise bird habitat has been fundamental to the approach taken.

The connecting channels themselves are of course limited in their bird habitat value by being, of necessity, open water areas with regular bottom and side bathymetry. However this does not preclude their having some habitat value to waterbirds.

2.0 MANAGEMENT AND CONTINGENCY PLANS

2.1 The proposal will have on-going costs which will become a burden to the community.

It is true that there will be on-going costs associated with the management of the proposal, principally in the area of open space and waterway management. However it is unfair and inaccurate to claim, in effect, that the proposal will result in a net burden to the community. The proposal will without doubt create significant 'added value' and net economic gain to the community, both initially and thereafter as a result of increased rates and other ongoing revenues, multipliers, etc. Consideration of costs must therefore be clearly be set against direct economic gains for the community as well as intangible community and amenity gains that are not readily quantifiable.

The government (Ministry for Planning as proponent and City of Belmont as co-proponent) are fully aware of the funding implications associated with the development proposal. Consequently, negotiations are presently underway to accommodate the various funding and management needs associated with the development.

2.2 The proposal is not supported (by the SRT) until a Long Term Waterways Manager/s to be identified and clearly defined in a Deed of Agreement.

It is the position of the Ministry for Planning that all management requirements will be resolved between the various arms of government before the implementation of the proposal.

2.3 Regular maintenance dredging of the new artificial waterway will be required to remove accumulated silt deposits.

The PER (main text and Appendix B) indicates that maintenance dredging will be required on a 20 to 25 year basis (in response to known levels of accretion), with additional remedial dredging following flood events in the river that mobilise bed load sediment.

2.4 The proponent should be responsible for managing M51.

Apart from the fact that System 6 M 51 is not owned by the proponent, it would not be appropriate, except possibly in the short term while permanent management arrangements are being finalised, for the proponent to be responsible for managing M51. M51 is a natural environment area with high conservation value within a reserve for Parks and Recreation (MRS), and requires management by a government agency with expertise in natural area management.

2.5 The proposal is not supported until contingency plans are prepared and included in the Deed of Agreement (SRT).

Our understanding is that contingency plans as required will be prepared to the satisfaction of the Swan River Trust and the Environmental Protection Authority.

2.6 Silt Curtains are to be used at the dredge site and at the outfall of the settling basin.

It is accepted that silt curtains should be placed at the outfall of the settling basin, however, given that dredging is to take place during winter months when high flow rates dominate and high levels of suspended sediment occur in the water column, it is difficult to understand the need or justification for silt curtains at the dredge site. Nevertheless, silt curtains can be used if this is the only way to meet the required performance standards.

2.7 The monitoring programme should include analysis for heavy metals, pesticides and other pollutants.

Monitoring for agreed and selected heavy metals and specific pollutants could be included as part of the water quality monitoring programme.

3.0 SYSTEM 6 (M51)

3.1 Modification of the System 6 saltmarsh (dredging) will not benefit the environment.

The proposal will not modify the System 6 saltmarsh area; the formerly proposed 'protective' moat will not now be pursued due to a failure to negotiate a suitable agreement with the land owners.

The upstream connecting channel will be cut through sedge and not through saltmarsh 'samphire' species. Technically the dredging will not touch the saltmarsh. It is to be noted that sedge is readily replanted, and as the PER points out sedge that is removed will be re-established around the margins of the new waterway and islands.

3.2 Public access should not be provided to the System 6 areas as it will result in the degradation of the environment.

It should be noted that unrestricted public access to the System 6 area is currently occurring and resulting in environmental degradation and exacerbation of the mosquito breeding problem.

Public access into the System 6 area is only proposed by means of a single entry/exit board walk and nature trail, and would be presented as an 'environmental interpretation' experience. As such it is a valid and suitably controlled form of access that should promote an 'appreciative' approach to the System 6 area. This approach is based on the park management principle that 'non-use promotes misuse' and that an absence of a management presence does more than anything to encourage environmentally destructive behaviour. The form of access proposed would provide relatively controlled access to observation points where maximum visual access to the environment is provided. This approach accommodates a well documented behavioural characteristic of park and natural area users, that they have a tendency to be site extensive in their perception of an area but site intensive in their use of a given area. In summary it is better to provide controlled access (in the manner described) than none at all. However, if the EPA prefers there is no access provided; the existing proposal will be dropped.

3.3 The proposed modifications may not be able to maintain the salt/fresh regime to retain the saltmarsh community.

There is no justification for this concern now as the proposed protective moat around the southern edge of the saltmarsh in the vicinity of Harold Street has been withdrawn. In effect the saltmarsh will remain unaffected.

3.4 The land replacing the dredged system 6 area will not have the same salt/fresh regime and seasonal inundation requirements needed for saltwater communities.

Only a comparatively small portion of System 6 is to be removed by dredging, and this is restricted to existing open water and sedge. It does not include saltmarsh community. The wetland area to be created in the upstream portion of the new waterway has been designed to be very similar to the adjacent area of System 6 which will be disturbed by dredging.

4.0 EXISTING WETLANDS

4.1 The PER under values the site as a water bird habitat.

The PER values the water bird habitat potential of the site greatly, and has specifically sought to design waterbird habitat value into the new waterway development at every possible opportunity. Furthermore a representative of the RAOU was specifically consulted to ensure bird habitat interests were adequately addressed.

4.2 The shallow seasonal nature of the lakes should have been retained.

The redevelopment of the previously existing lakes (permanent and seasonal) was approved by EPA on the basis of a report prepared by Tingay and Associates, and was not an issue to be addressed by the current PER.

4.3 The wetlands are in Category C. The management objectives will not be achieved.

The wetlands (as they were) no longer exist and their removal/modification was approved by the EPA. This issue therefore no longer applies.

POLLUTION

5.0 BELMONT TIPSITE

5.1 Management plans should have been prepared prior to disturbance of the site.

Development plans for the tipsite modification have been prepared and approved by the EPA.

The project brief requires that the tipsite be left largely undisturbed, and the proposal as included in the PER impinges on the tipsite in only a very slight way. The degree to which the tip is directly affected by current (approved) works includes:

- recontouring of the upper surface and sides to improve the visual appearance of the tip;

- introduction of topsoil to parts of the tip surface to allow vegetation cover to establish; and
- cutting back a small portion of the east facing edge of the tipsite to 2.5 m AHD, to allow for an adequate floodway (as designated by the WAWA).

All works currently taking place (as outlined above) received approval from the EPA.

An overall management plan for the waterway and the tipsite POS is being prepared in conjunction with the SRT, EPA, MfP and City of Belmont. This is a requirement of the Development Heads of Agreement.

5.2 The PER does not provide sufficient detail on the history or current condition of the tip.

A thorough investigation of all available documentation (including test results) has been made, together with discussions within the City of Belmont (who operated the tip), EPA, MfP and SRT. All indications are that the tipsite is reasonably inert. Notwithstanding, the tipsite is, as pointed out above, being left largely undisturbed.

5.3 The current earthworks should have been subject to a PER.

This is not an issue relevant to this proposal. The decision on this issue was made by the EPA and it was not a requirement to be incorporated in the PER.

5.4 Leachates from the tip could be a risk to the river and groundwater.

The tip is, from a functional point of view, unaffected by the Ascot Waters development. The rate of leaching of contaminants from the tip remains essentially unaffected. So the concern expressed is no more justifiable now than in the past. No increase in leaching is expected in the future; in fact, the current low levels are expected to continue to decline. It is relevant to reiterate that existing evidence indicates that the rate of leachates coming from the tip has decreased over the last 15 years.

6.0 CENTRAL BELMONT MAIN DRAIN (CBMD)

6.1 Measures to improve the drain should be implemented separately and should not be tied to a project that is detrimental to the river.

We do not accept the contention that the project is detrimental to the river. To the contrary, improvements to the drain as indicated were not required but are put forward for reasons of good design and environmental responsibility on the part of the Consortium. If the proposals to substantially improve the drain had not been offered in this way then the full cost of improvements to the drain to be "implemented separately" would have fallen entirely upon the Water Authority of Western Australia and the City of Belmont (i.e. the public purse). A net gain is therefore established for the community.

The project brief for the Ascot Waters development only requires that the development:

- not be adversely affected by the CBMD; and
- allow for the urban drainage function to continue to operate unimpeded.

6.2 New wet detention basins should be on the Mathieson Road drain and not on the realigned CBMD.

It is agreed that the Mathieson Road drain needs treatment and detention basins may well be the best technical solution, however the majority of the Mathieson Road drain catchment is outside the project site, and partly falls on land owned by the Western Australian Turf Club. It is therefore not possible for the Consortium to establish a new wet detention basin on the Mathieson Road drain as proposed. However, the Consortium, in conjunction with the City of Belmont and MfP, has set in place strategies to address the Mathieson Road drain. In this regard, negotiations have already commenced with the Western Australian Turf Club and other relevant parties, and a working committee has been established to recommend solutions and financial arrangements to achieve a solution.

SOCIAL IMPACTS

7.0 MOSQUITOS

7.1 People should not live and recreate in an area that is a known mosquito breeding area.

Mosquitos are ubiquitous throughout the Swan Coastal Plain, as are their habitats, and mosquitos habitually travel up to several kilometres to feed. Tens of thousands of people live and recreate in close proximity to known mosquito habitats, and probably the majority of the population are exposed to mosquitos on a regular basis.

7.2 Residential development is likely to increase the use of chemicals to control mosquitos which will be harmful to waterbirds.

This area is subject to intensive and on-going mosquito control spraying by the City of Belmont, with or without the Ascot Waters development. However as the PER points out the Health Department has been studying the mosquito management options for the System 6 M51 saltmarsh area for sometime, and the saltmarsh expert from Murdoch University undertaking that study was engaged by the Consortium to provide advice. The intention of the Health Department study is to explore the opportunity for 'physical' control techniques rather than chemical spraying, a proposal supported by the Ascot Waters Consortium.

7.3 The proposal is not supported by the SRT until a mosquito control strategy is developed.

A strategy is being developed and will be implemented in liaison with the Medical Entomology Section of the Public Health Department, the Swan River Trust, and the City of Belmont Health Department.

7.4 The Ascot Waters project provides the ideal opportunity to implement runnelling and spot filling.

The PER expressed the same view, based on the same advice, and it is the intention (as the PER indicates) to explore the potential for physical control techniques (ie runnelling and spot filling).

7.5 The developers should be obliged to conduct a 10 cm contour survey of the entire saltmarsh.

Given that the saltmarsh area is owned by 6IX radio station and the National Transmission Authority and that the virulence of the mosquito breeding site was considerably enhanced as a consequence of the installation of their facility, it could be argued that it is they that should contribute a contour survey as suggested as part of the information base needed to develop an effective mosquito control programme.

As it happens the City of Belmont has undertaken a 10 cm contour survey.

7.6 Inform all prospective buyers of property in the Ascot Waters development in writing of the mosquito nuisance and associated health risk.

We argue that throughout the state the control of mosquitos is a community service undertaken by the local councils together with the Health Department. It would be unfair in the extreme for a developer of **appropriately zoned land** who has no control whatever over the land containing the mosquito breeding site to be imposed with the suggested requirement.

Community awareness and the dissemination of information should be on a regional and not site-specific scale. Given that no other developers or dealers in land along the Swan River are required to provide such information, the fairness of this suggestion should be considered carefully.

Addendum

The proposed Ascot Waters project provides an ideal opportunity to remedy a serious mosquito nuisance and health risk problem in an environmentally responsible and sensitive manner.

Mosquito breeding in the area has been monitored for many years by both the City of Belmont and the Public Health Department and the major breeding sites are well known. To date, mosquito populations in the area have been controlled by the City of Belmont through regular chemical treatment of breeding areas using Abate (temephos) larvicide.

Stage One of the development (which has been constructed) has already removed a number of seasonal breeding sites which occurred in the seasonal and degraded wetlands. Approval of Stage Two of the development will enable the proponents to honour their commitment to fund a physical mosquito control strategy for the major breeding sites which occur in the System 6 area.

These sites include the large saltmarsh on which the 6PR/IX radio mast is located, and a track which runs due north of the tip. The track is the result of uncontrolled public access into System 6 by four wheel drivers. It is proposed to fill the track and incorporate it into the proposed boardwalk and interpretive nature trail through the System 6 islands. It is also proposed to control vehicular access to System 6 either by appropriate fencing or placement of bollards.

The breeding problem in the saltmarsh around the radio mast is in fact the result of the physical ground disturbance caused to the site when the mast and its subterranean earthing mat was originally constructed. The City of Belmont has already surveyed the site and produced a topographic map at 1:1,000 scale giving 10 cm contours. The Development Consortium proposes to design and implement an appropriate network of

runnels and spot filling in consultation with the Medical Entomology Section of the Public Health Department, the Swan River Trust and the City of Belmont Health Department.

The above management actions proposed by the Development Consortium are in accordance with advice received from the above authorities, and will result in a substantial reduction in the mosquito nuisance problem and health risk from this site.

Given the above, and given that the developer does not own the land where the mosquito problem exists, and further given that the Ascot Waters development land is already appropriately zoned for residential use, it seems unfair for the developer to assume the responsibility of warning prospective residents of the mosquito problem when he is about to undertake works to substantially remedy the problem.

It seems even more unfair when one considers that dealers in land and real estate elsewhere along the Swan River do not have this responsibility. Surely the responsibility rests with local and state government authorities whose role it is to manage this issue on a regional basis.

8.0 MISCELLANEOUS

8.1 The open space created on the tipsite will not benefit wildlife.

The tipsite, previously left in an unmanaged and vacant state, is being landscaped with suitable native 'dry landscaping' vegetation following the introduction of topsoil cover for large portions of the tip surface. This action is a considerable improvement on the previous state of the tip and will benefit wildlife by virtue of creating a vegetated habitat where there was formerly none.

8.2 Fertiliser and pesticides used on the open space will contribute to pollution in the river.

The majority of landscaping in the Region Open Space component of the development (ie west of the new waterbody) will be appropriate dry landscaping with an emphasis on native plant species. There be no 'manicured' parkland with a high need for fertiliser or pesticide applications. The PER emphasises that appropriate low maintenance landscaping will dominate, and that the principal design objective is to recreate a riverine floodplain landscape with high wildlife habitat value around the margins of the waterway.

Given that a prime objective for the overall waterbody is to achieve the best water quality possible, appropriate landscaping to minimise fertiliser and pesticide impacts would be fundamental to the design. This is clearly expressed in the PER. It is now part of the City of Belmont and Western Australian Turf Club open space management strategies to ensure that grassed and formerly managed landscape areas move to controlled fertiliser programmes.

8.3 Argentine ant treatments may have contaminated the site.

As the PER explains the developers were required and undertook an assessment of potential site contamination at the commencement of the project, and insignificant contamination levels were detected.

8.4 The bicycle route along the north and east side of the development should remain open during construction.

So far as it is possible from a practical and safety point of view, the cycle route will remain open to users. Temporary closures will be unavoidable. This inconvenience will be substantially offset by the permanent extension of the dual use path through the Ascot Waters site to the Garrett Road Bridge.

8.5 The existing dual path along the south side of Resolution Drive should be retained for through journeys.

There is no intention at this point to close or remove the dual use path, though a reconfiguration or realignment may be necessary as a part of wider construction works involving Resolution Drive.

8.6 Risk of groundwater contamination from the proposed residential development.

There is no risk to groundwater from the proposed residential development, and there are no grounds whatsoever for the concern that there might be. Much of the site was a former industry site, and as the PER indicates even those former activities have not resulted in groundwater contamination.

ATTACHMENT 'A'

Item 1A

Resolution of the long-term future management arrangements for the proposed waterway is recognised as an essential requirement, and there is no doubt that all involved parties will achieve a satisfactory agreement on this matter. A final commitment will be possible following the EPA's assessment of the proposed project, in addition to necessary negotiations between the Development Consortium, the Proponent (WAPC) and other government agencies with a statutory responsibility for Waterway Reserves.

Item 1B

All dredging and spoil disposal activities will be undertaken in such a manner as to comply with Swan River Trust guidelines which are:

- direct drainage from settlement ponds to the Swan River is prohibited;
- a silt curtain is to be established at the discharge point of the settlement pond;
- drawings for the construction of the settlement ponds will be submitted to, and approved by, the Swan River Trust prior to development commencing.
- dewatering and settlement pond water quality is to meet Trust requirements prior to discharge. A water quality monitoring report will be submitted fortnightly during dewatering;
- dredging should not result in a change to the ambient water quality of the river of greater than ten per cent (10%). Ambient water quality concentration (TSS) is to be determined as per Trust guidelines and all results are to be submitted to the Trust for consideration. If necessary, silt curtains will be established around the dredging operation to contain suspended material.

Item 2

The Consortium commits to preparing a Waterway Monitoring Programme to assess the effectiveness of the flushing, effectiveness of sealing the cut through the southern end of the tip, presence of leachate and the overall performance of the waterway. This programme will be submitted to the Swan River Trust for approval prior to development commencing. The results of the monitoring programme are to be submitted annually to the Trust for a minimum of five years.

It is anticipated that the programme will include:

- investigation of the water exchange characteristics of the waterbody to confirm the accuracy of predicted flushing rates;
- intensive (monthly) monitoring for leachates over a period of six months immediately post completion in the vicinity of the channel cut through the southern end of the tip;
- intensive sampling programmes on an opportunistic basis during the occurrence of a significant algal bloom in the river during spring and summer;

- regular monitoring (quarterly) of indicator parameters to confirm overall performance of the waterway.

Item 3

Detailed contingency plans will be prepared for implementation in the event that water quality in the waterway declines to the extent that its amenity is adversely affected as a result of malodours and/or floating algal scum. The following scope of activities is proposed:

- **Malodours:** The cause of the malodours will be determined and, if found to be directly related to anoxia within the waterbody, remedial action will oxygenate and mix the waterbody by installing a bubble curtain oxygenator in the southern channel.

- **Floating accumulations of algae:** Such accumulations will be confined by booms and retrieved by an oil skimmer into a nearby sullage tanker for subsequent disposal at an approved landfill site.

The above equipment is available on contract through the Waterways Commission. The contingency plans will be submitted to the Swan River Trust for approval.

Items 4 and 5

The proposed development described in the PER is limited to the construction of two channels to connect a pre-existing man-made lake to the Swan River. The Proponent is not responsible for any pollution emanating from the adjacent Belmont tip site other than that which may be caused by the proposed development.

Work undertaken by the Swan River Trust in 1982, 1993 and 1995 indicated that the activity within the tip was limited and that ammonia was the only chemical parameter leaching from the tip likely to be of concern. The 1993 report prepared for the State Planning Commission confirmed that active decomposition, resulting in the ammonia, was occurring only in the north-western corner. The extent to which works will interfere with the tip is limited to the tip's south-eastern corner and near where the eastern edge of the floodway is to be situated and at its southern extremity where the navigation channel is to be cut.

The affected area of tip, illustrated in drawing WP0232-00-03-002/I, is estimated at 85,000 m^3 which is less than 5% of the tip volume. This drawing also shows the presence of a 500 mm thick clay liner (as recommended by the geotechnical consultants) which is to be placed in all areas where the tip has been cut into. This clay liner will be designed and constructed in accordance with standard geotechnical practice. Given this it is highly unlikely that active areas of the tip will be exposed to river waters.

The Consortium has committed to monitoring the quality of water within the newly constructed waterway to forewarn of any deterioration. Monitoring will also be undertaken in the area where the cut is to intersect the tip. The Consortium has been advised by its Consultants that the specified level of monitoring will be more than sufficient to ensure that the Consortium can identify problems in relation to the environmental consequences of its development work. Accordingly, the Consortium views further monitoring of the tip to be outside its responsibility.

Appendix 6.

Ascot Waters Water Quality

Memorandum

Appendix 6

To : Members of the Environmental Quality Committee
From : Stephen Wong
Date : 28/8/95
Subject : Ascot Waters water quality
File No. : SA55.081/1

The two environmental issues that require some considerations for the Ascot Waters project are:

1. The water quality of the Central Belmont main drain.
2. The Belmont rubbish tip at Ascot

The water quality of Central Belmont main drain (CBMD)

The Belmont City Council initiated a water quality study on the Central Belmont main drain (CBMD) in 1992. The study looked at 189 hectares of the drain catchment comprising residential, light industrial, commercial and recreational areas. Table 1 shows the mean nutrient concentrations and bacteriological counts at the drain outlet.

Year	TP mg/L	SRP mg/L	TN mg/L	Faecal Coli org/100ml	Faecal Strep. org/100 ml
1992	0.36	0.16	2.9	1008	726

The mean nutrient concentrations have exceeded the ANZECC environmental guidelines for protection of aquatic ecosystems (TP 0.01 to 0.1 mg/l, TN 0.1 to 0.75). There is a higher proportion of particulate P in the water which can be removed with sufficient retention time before discharging to the river.

Based on the nutrient data, the nutrient contribution from CBMD is considered significant when compared to other urban drains. The source of the nutrient flux is now being pursued by the Council on a separate study to quantify the nutrient loads.

The WAWA has set up a monitoring station at CBMD for its urban drainage study for 1994. It will provide time series data for actual nutrient loss from the catchment. The coordinator of the project is Howard Tan.

The bacteriological counts are considered excessive under the National Health and Medical Research Council (NHMRC) which favours the use of faecal coliform (FC) bacteria as indicative factor of health risk for swimming area. For primary contact, the FC should not exceed 150 org/100ml and for secondary contact, the FC should be within 1000 org/100ml.

The data show that the water quality is unsuitable for primary contact recreation (swimming). The source of such high coliform warrant further upstream investigation. However, the likely sources are from the Western Australia Turf Club (WATC) and the unsewered residential cum stable properties within the drain catchment. Table 2 shows these two catchments are significant contributors to pollutant loads to the CBMD.

Table 2 shows the mean and median water quality from the two sampled catchments

Site (mg/L)	TP	SRP	NH3	NO3	TN	Faecal Coliforms org/100ml	Faecal Strep. org/100 ml
WATC (median)	1.1	0.7	1.3	4.4	5.6	1000	1110
WATC (mean)	1.9	1.2	1.8	4.6	9.1	11883	12715
Mathieson (median)	0.4	0.3	0.4	16.5	22.4	440	470
Mathieson (mean)	0.4	0.3	0.4	14.9	19.2	17203	3207

Recent water quality analysis found that there is concerned of dieldrin concentration between 0.008-0.014 ug/L.

Council disused rubbish tip

The Belmont sanitary landfill is sited on an estuarine wetland adjacent to the Swan River. The tip is separated from the river by a band of natural estuarine wetlands now known as System 6 Conservation Reserves. In 1981, eleven cored boreholes were constructed around the tip to determine whether nutrient leaching to the river was evident. Extensive surface and ground water sampling were conducted in June 1982 and a report was subsequently prepared by the Swan River Management Authority. The conclusions were that the overall phosphorus leaching from the tip was not significant possibly due to the clayey nature of the local soils. However high ammonia concentrations reflected that the tip was leaching to the river.

No further monitoring was done after its closure. In 1993 and 1995 the Trust officer conducted groundwater monitoring from the existing bores and the results as tabulated in Tables 3 and 4. Refer attached map.

Table 3 Results of bore sampling taken in 1993

Elements	CBMD	PWD1	PWD2	PWD3	PWD6	PWD8	PWD11
TP	0.01	0.46	0.2	0.95	0.04	0.40	0.22
TN	2.1	100	100	130	7.4	41	2.8
NH4-N	0.63	93	92	120	6.5	39	2.2
NO3-N	0.48	0.04	0.02	0.02	0.05	0.02	0.03
As	0.005	0.005	0.005	0.005	0.005	0.005	0.005
Cd	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Fe	6.5	0.28	4.2	3.4	4.0	0.15	4.4
Pb	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Mn	0.08	0.26	0.08	0.17	0.26	0.37	0.27
Cu	0.001	0.01	0.01	0.001	0.001	0.002	0.008
Cr	0.002	0.003	0.01	0.001	0.002	0.004	0.005
Ni	0.001	0.002	0.003	0.002	0.004	0.002	0.005
Zn	0.02	0.03	0.02	0.02	0.02	0.1	0.37

Table 4 Results of bore sampling taken in 1995

Elements	PWD 6	PWD8	PWD10	PWD11	AFH 1	AFH 3	AFH 4	AFH 5	AFH8
TP	0.09	0.7	0.26	0.04	0.04	0.01	0.01	0.16	
TN	20	150	110	4.5	6.3	0.26	0.37	1.8	
NH4-N	14	120	80	3.6	4.90	0.22	0.27	0.94	
NO3-N	0.06	0.05	0.02	0.02	0.02	0.02	0.02	0.03	
As	0.2	0.4	0.5	0.1	1.0	0.1	0.1	0.1	
Cd	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	
Fe	1.6	7.7	4.3	3.1	83	1.1	0.06	0.21	
Mn	0.68	0.28	0.25	0.19	7.4	0.03	0.2	0.02	
Cu	0.05	0.05	0.09	0.03	0.2	0.05	0.06	0.23	
Cr	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	
Ni	0.05	0.05	0.05	0.05	0.5	0.05	0.05	0.05	
Zn	0.03	0.11	0.04	0.06	0.2	0.02	0.02	0.02	
Dieldrin ug/L					0.004		0.002	0.011	0.010

Appendix 7

ARLA Laboratory Report

There is significant reduction in TP concentrations compared to the 1983 investigation. However ammonia-N concentrations are high indicating that organic decomposition is still occurring within the tip. Trace metal concentrations are not considered high in the context of landfill leachate and therefore it may not grossly affect the water quality of the river.

Recent bore sampling nearer to Resolution Drive found elevated dieldrin concentrations above the ANZECC guidelines of 0.002ug/L. No other organo chlorine pesticides were detected. Hydrocarbon compounds were not detected.

Remark and Recommendation

1. Generally, the water quality from CBMD is unacceptable for primary contact recreation because of the high levels of bacteria and dieldrin concentration. Passive recreation in the new marina is preferred.

2. Recent groundwater monitoring did not show high trace metal concentrations but organic breakdown in some areas are still continuing resulting in higher ammonia nitrogen concentrations leaching off site. This usually appears like "springs" or discerning seepage around the tip face fronting the river.

3. Even though higher dieldrin concentrations were detected in some of the monitoring bores, the river does not appear to be impacted. A possible factor could be due to mass dilution.

4. Continual monitoring of the existing groundwater quality around the tip is therefore recommended after the proposed "cut". A detail monitoring programme should be forwarded to the Trust for consideration.

5. River dredging is likely to increase turbidity resulting rich organic silt materials and other pollutants to be transported further downstream in the river. Silt curtains around the dredged site is required to contain suspended materials arising from this dredging process. A criteria of not exceeding 10% above the ambient water quality of the river is required. For this purpose, the ambient concentrations of suspended solids is determined by analysis of samples collected mid height in water column, mid point in the river adjacent to the dredged site, 500 metres upstream and downstream of the dredged area.

6. Proposal to dewater the dredge spoil should be in close consultation with the Trust so that adequate measures are taken to minimise pollution to the river. A comprehensive monitoring programme should be incorporated with this proposal to the satisfaction of the Trust.

7. A silt curtain is recommended at the discharge to the waterways after adequate settling.

8. Compacted clay capping should be provided to the disturbed tip areas to the satisfaction of the Trust. However propoent should considered clay capping of the entire tip to minimise leachate formation.

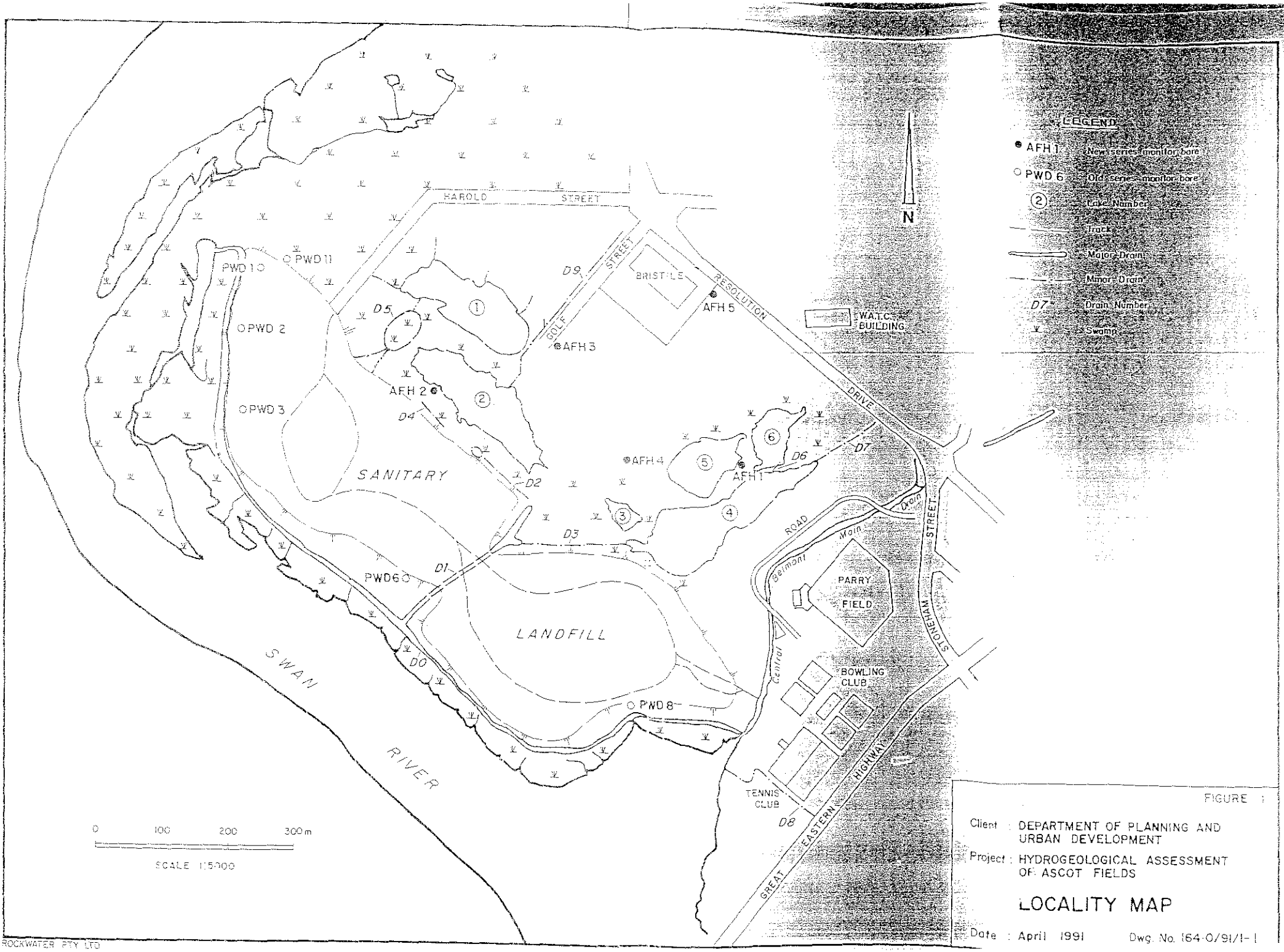


FIGURE 1

Client : DEPARTMENT OF PLANNING AND URBAN DEVELOPMENT

Project : HYDROGEOLOGICAL ASSESSMENT OF ASCOT FIELDS

LOCALITY MAP

Date : April 1991 Dwg. No. 164-0/91/1-1

ANALYTICAL REFERENCE LABORATORY (W.A.) PTY. LTD.

LABORATORY REPORT

REPORT NO: ARL/9342-49
DATE: 20 December 1994

CLIENT: CMPS& F Pty Ltd
PO Box 6311
EAST PERTH WA 6004

ATTENTION: Mr Richard Mander-Jones

SAMPLE DESCRIPTION: Eight water samples for analysis of total petroleum hydrocarbons, polycyclic aromatic hydrocarbons, polychlorinated biphenyls, organochlorine pesticides and heavy metals.

PROJECT NAME: Ascot Fields

JOB NUMBER: WP0467

DATE RECEIVED: 06 December 1994

RESULTS :

Total Petroleum Hydrocarbons :

Lab No	Sample Identification		C_{6-9}	C_{10-14}	C_{15-28}	C_{28-38}
			mg/l			
9342	AFH1	05.12.94	<0.02	<0.02	<0.04	<0.04
9343	AFH2	05.12.94	<0.02	<0.02	<0.04	<0.04
9344	AFH3	05.12.94	<0.02	<0.02	<0.04	<0.04
9345	AFH4	05.12.94	<0.02	<0.02	<0.04	<0.04
9346	AFH5	05.12.94	<0.02	<0.02	<0.04	<0.04
9347	PWD1	05.12.94	<0.02	<0.02	<0.04	<0.04
9348	PWD6	05.12.94	<0.02	<0.02	<0.04	<0.04
9349	PWD11	05.12.94	<0.02	<0.02	<0.04	<0.04

CMPS & F PERTH

DATE	REC'D	DOC. No.
22-12-94	WH	4110

DIST	ACTION	INITIAL	DATE
RMS			

FILE No. WP0467 ENTERED WH

ANALYTICAL REFERENCE LABORATORY (W.A.) PTY. LTD.
A.C.N. 050 159 898
55 Wittenoom Street, East Perth, Western Australia 6004
Telephone: (09) 221 1415. Facsimile: (09) 325 2398
NATA Registration No. 2377

Polychlorinated Biphenyls :

Lab No	Sample Identification	
9594	MB1	12.12.94
9595	MB2	12.12.94

No polychlorinated biphenyls were detected in the two water samples. Limit of detection: 0.05 ug/l.

Organochlorine Pesticides :

Lab No	Sample Identification		DDT & Metabolites	Dieldrin
			ug/l	ug/l
9594	MB1	12.12.94	<0.005	<0.005
9595	MB2	12.12.94	<0.005	0.005

Total Petroleum Hydrocarbons :

Lab No	Sample Identification		C_{6-9}	C_{10-14}	C_{15-28}	C_{28-38}
					mg/l	
9594	MB1	12.12.94	<0.02	<0.02	<0.04	<0.04
9595	MB2	12.12.94	<0.02	<0.02	<0.04	<0.04

Total Dissolved Solids :

Lab No	Sample Identification		Total Dissolved Solids
			mg/l
9594	MB1	12.12.94	900
9595	MB2	12.12.94	650

Pentachlorophenol :

No pentachlorophenol was detected in the two water samples. Limit of detection: 5 ug/l.

Polycyclic Aromatic Hydrocarbons :

Lab No	9342	9343	9344	9345
Sample Identification:	AFH1 05.12.94	AFH2 05.12.94	AFH3 05.12.94	AFH4 05.12.94
		ug/l		
Acenaphthene	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	<0.1	<0.1	<0.1	<0.1
Anthracene	<0.1	<0.1	<0.1	<0.1
Benz(a)anthracene	<0.2	<0.2	<0.2	<0.2
Benzo(b)fluoranthene	<0.2	<0.2	<0.2	<0.2
Benzo(k)fluoranthene	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	<0.2	<0.2	<0.2	<0.2
Benzo(g,h,i)perylene	<0.2	<0.2	<0.2	<0.2
Chrysene	<0.2	<0.2	<0.2	<0.2
benzo(a,h)anthracene	<0.2	<0.2	<0.2	<0.2
Fluoranthene	<0.1	<0.1	<0.1	<0.1
Fluorene	<0.1	<0.1	<0.1	<0.1
Indeno(1,2,3-c,d)pyrene	<0.2	<0.2	<0.2	<0.2
2-methyl-naphthalene	<0.1	<0.1	<0.1	<0.1
Naphthalene	<0.1	<0.1	<0.1	<0.1
Phenanthrene	<0.1	<0.1	<0.1	<0.1
Pyrene	<0.1	<0.1	<0.1	<0.1

Lab No	9346	9347	9348	9349
Sample Identification:	AFH5 05.12.94	PWD1 05.12.94	PWD6 05.12.94	PWD11 05.12.94
		ug/l		
Acenaphthene	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	<0.1	<0.1	<0.1	<0.1
Anthracene	<0.1	<0.1	<0.1	<0.1
enz(a)anthracene	<0.2	<0.2	<0.2	<0.2
Benzo(b)fluoranthene	<0.2	<0.2	<0.2	<0.2
Benzo(k)fluoranthene	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	<0.2	<0.2	<0.2	<0.2
Benzo(g,h,i)perylene	<0.2	<0.2	<0.2	<0.2
Chrysene	<0.2	<0.2	<0.2	<0.2
Dibenzo(a,h)anthracene	<0.2	<0.2	<0.2	<0.2
Fluoranthene	<0.1	<0.1	<0.1	<0.1
Fluorene	<0.1	<0.1	<0.1	<0.1
Indeno(1,2,3-c,d)pyrene	<0.2	<0.2	<0.2	<0.2
2-methyl-naphthalene	<0.1	<0.1	<0.1	<0.1
Naphthalene	<0.1	<0.1	<0.1	<0.1
Phenanthrene	<0.1	<0.1	<0.1	<0.1
Pyrene	<0.1	<0.1	<0.1	<0.1

Heavy Metals :

Lab No	Sample Identification	Arsenic	Cadmium	Chromium	Copper
			mg/l		
9594	MB1 12.12.94	<0.02	<0.0005	<0.01	<0.01
9595	MB2 12.12.94	<0.02	<0.0005	<0.01	<0.01

Lab No	Sample Identification	Nickel	Mercury
		mg/l	
9594	MB1 12.12.94	<0.01	<0.0005
9595	MB2 12.12.94	<0.01	<0.0005

David Williams
Manager

ANALYTICAL REFERENCE LABORATORY (W.A.) PTY. LTD.

LABORATORY REPORT

REPORT NO: ARL/9594-95
DATE: 21 December 1994

CLIENT: CMPS& F Pty Ltd
PO Box 6311
EAST PERTH WA 6004

ATTENTION: Mr Richard Mander-Jones

SAMPLE DESCRIPTION: Two water samples for analysis of total petroleum hydrocarbons, polycyclic aromatic hydrocarbons, polychlorinated biphenyls, organochlorine pesticides, total dissolved solids, pentachlorophenol and heavy metals.

PROJECT NAME: Ascot Fields

JOB NUMBER: WP0467

DATE RECEIVED: 12 December 1994

RESULTS :

Polycyclic Aromatic Hydrocarbons :

Lab No :	9594	9595
Sample Identification:	MB1 12.12.94	MB2 12.12.94
	ug/l	
Acenaphthene	0.3	<0.1
Acenaphthylene	0.1	<0.1
Anthracene	0.2	<0.1
Benz(a)anthracene	0.2	<0.2
Benzo(b)fluoranthene	0.3	<0.2
Benzo(k)fluoranthene	0.2	<0.2
Benzo(a)pyrene	0.4	<0.2
Benzo(g,h,i)perylene	<0.2	<0.2
Chrysene	0.2	<0.2
Dibenzo(a,h)anthracene	<0.2	<0.2
Fluoranthene	0.7	<0.1
Fluorene	0.3	<0.1
Indeno(1,2,3-c,d)pyrene	<0.2	<0.2
2-methyl-naphthalene	0.2	<0.1
Naphthalene	0.2	<0.1
Phenanthrene	0.4	<0.1
Pyrene	0.7	<0.1

Polychlorinated Biphenyls :

Lab No	Sample Identification	
9342	AFH1	05.12.94
9343	AFH2	05.12.94
9344	AFH3	05.12.94
9345	AFH4	05.12.94
9346	AFH5	05.12.94
9347	PWD1	05.12.94
9348	PWD6	05.12.94
9349	PWD11	05.12.94

No polychlorinated biphenyls were detected in the eight water samples. Limit of detection: 0.05 ug/l.

Organochlorine Pesticides :

Lab No	Sample Identification		DDT & Metabolites	Dieldrin
			ug/l	ug/l
9342	AFH1	05.12.94	<0.005	<0.005
9343	AFH2	05.12.94	<0.005	<0.005
9344	AFH3	05.12.94	<0.005	<0.005
9345	AFH4	05.12.94	0.006	<0.005
9346	AFH5	05.12.94	<0.005	0.005
9347	PWD1	05.12.94	<0.005	<0.005
9348	PWD6	05.12.94	<0.005	<0.005
9349	PWD11	05.12.94	0.006	<0.005

No other common organochlorine pesticides were detected in the eight water samples (ie less than 0.005 ug/l).

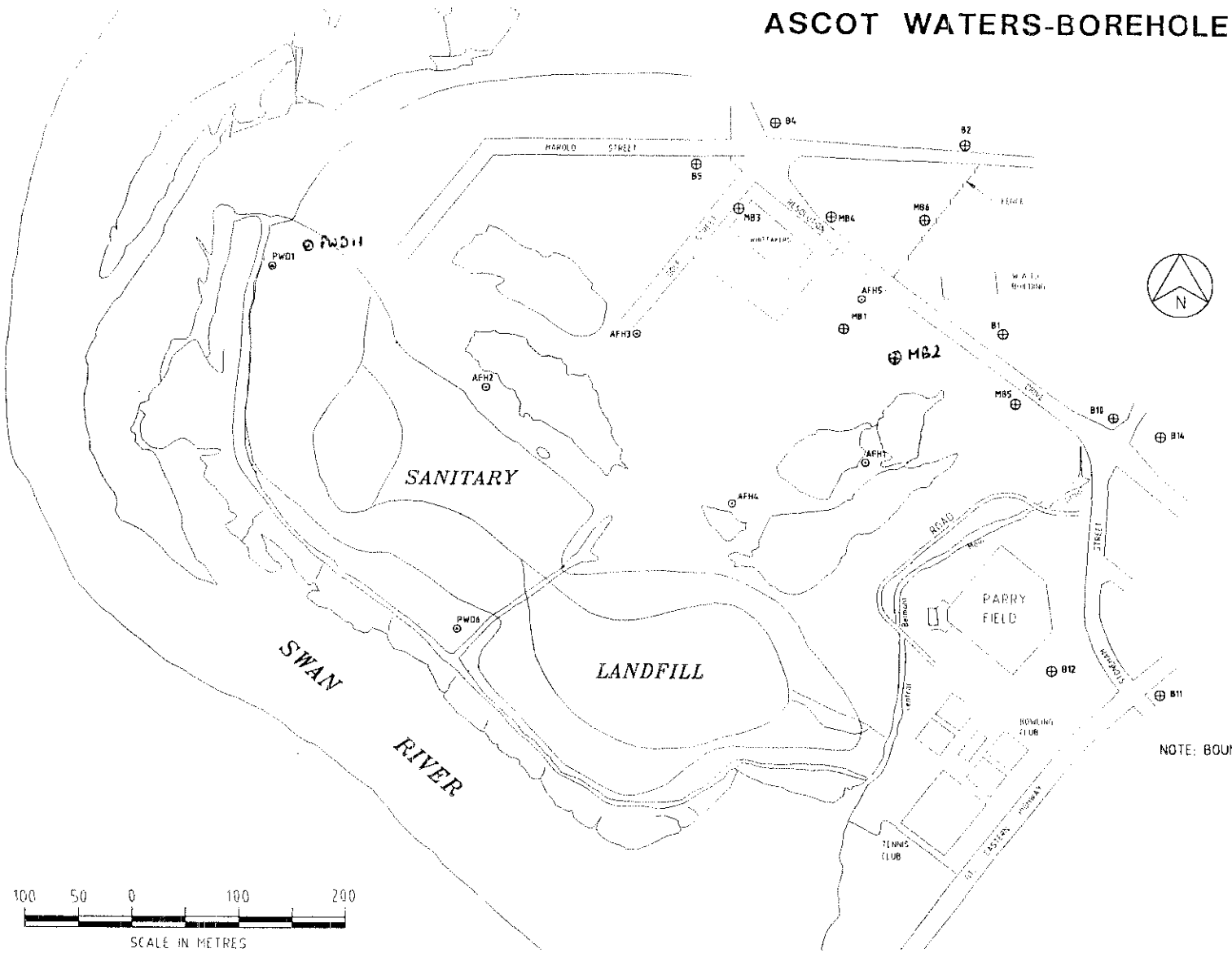
Heavy Metals :

Lab No	Sample Identification		Arsenic	Cadmium	Chromium	Copper
				mg/l		
9342	AFH1	05.12.94	0.02	<0.0005	<0.01	<0.01
9343	AFH2	05.12.94	<0.02	<0.0005	<0.01	<0.01
9344	AFH3	05.12.94	<0.02	<0.0005	<0.01	<0.01
9345	AFH4	05.12.94	0.02	<0.0005	<0.01	<0.01
9346	AFH5	05.12.94	<0.02	<0.0005	0.04	0.01
9347	PWD1	05.12.94	<0.02	<0.0005	<0.01	<0.01
9348	PWD6	05.12.94	<0.02	<0.0005	<0.01	<0.01
9349	PWD11	05.12.94	0.02	<0.0005	<0.01	<0.01

Lab No	Sample Identification		Nickel	Mercury
			mg/l	
9342	AFH1	05.12.94	<0.01	<0.0005
9343	AFH2	05.12.94	<0.01	<0.0005
9344	AFH3	05.12.94	<0.01	<0.0005
9345	AFH4	05.12.94	<0.01	<0.0005
9346	AFH5	05.12.94	0.01	<0.0005
9347	PWD1	05.12.94	<0.01	<0.0005
9348	PWD6	05.12.94	<0.01	<0.0005
9349	PWD11	05.12.94	<0.01	<0.0005

David Williams
Manager

ASCOT WATERS-BOREHOLE LOCATION PLAN



NOTE: BOUNDARIES ARE APPROXIMATE.

Appendix 8

Proponent's commitments

ISSUES	OBJECTIVES	No	COMMITMENTS	WHEN	BY WHOM	To whose satisfaction
1.Impact of dredging on Swan River	•Minimise the impact of dredging on the river system during dredging and demonstrate that dredging will be environmentally beneficial to the river.	1.	•Prepare an Environmental Management Programme (EMP) as per SRT guidelines and submit to SRT for approval prior to its implementation. The EMP is to include the following commitments: •to dredge during autumn/winter period; •to settle dredge water in stilling pond prior to discharge to river; •use of silt curtains; •monitor water quality and benthic fauna, and •reporting of results.	•The EMP is to be submitted and approved prior to the start of dredging. •Monitor and reporting of results fortnightly during dredging programme and submit final report within one month of completion of dredging.	•Consortium	Minister for Environment on advice from SRT and DEP.
		2.	•Implement the approved EMP.			SRT
2. Impact on System 6	•To encourage the growth and regeneration of local indigenous flora; maintaining water bird habitats; and allowing recreation activities which are compatible with the conservation of flora and fauna.	3.	•Prepare an EMP to include the following committments: •replacement of System 6 sedge habitat removed by dredging the channels •To monitor the success of habitat replacement and report findings to appropriate authorities. •to address public access and weed/rubbish/fire/pest/domestic pet control and submit to authorities for approval prior to its implementation.	•The EMP is to be submitted and approved prior to the start of dredging. •Six months after completion of dredging.	•Consortium (Consortium for the first year, and thereafter by the appropriate government agency).	Minister for Environment on advice from Swan River Trust (SRT) and Department of Environmental Protection (DEP).
		4.	•Implement the approved EMP.	•implement within two weeks of completion of dredging.		

Appendix 8 Summary of Proponent Commitments
Commitment 21 is not to be audited by DEP

ISSUES	OBJECTIVES	No	COMMITMENTS	WHEN	BY WHOM	To whose satisfaction
3. Management and monitoring of leachate from tip site.	•To ensure that leachate from the tip does not result in a decline in water quality in the river and waterway or affect the environmental values of the river.	5.	•Prepare an EMP for construction of the channel through the southern end of the tip site and submit to the SRT and DEP for approval prior to construction of channel. The EMP is to include the following commitments: •install clay-lined seal on tip side of channel; •monitor for leachates in channel over period of six months after completion; •incorporate channel in waterways monitoring programme; •develop a contingency plan in association with SRT/DEP and Geological Survey (GSWA) in event of serious leachates being detected.	•The EMP is to be submitted and approved prior to the start of dredging..	•Consortium •Range and type of leachates to be advised by GSWA and Government Chemical Laboratories (GCL).	•Minister for Environment on advice from SRT, DEP, MfP and City of Belmont.
		6.	•Implement the approved EMP			•SRT/DEP/ GSWA
4. Management of Central Belmont Main Drain (CBMD)	•To ensure that water quality in the drain is maintained or improved so that the environmental uses in the river are protected.	7.	•The Consortium will remediate the CBMD and its outlet in accordance with the proposals set out in the PER or any alternative improved arrangement mutually acceptable to the Consortium and the relevant authorities and with the approval of detailed working drawings by the Water Authority of Western Australia (WAWA) and City of Belmont.	•Working drawings to be submitted prior to remediation commencing .	•Consortium	•WAWA and City of Belmont.
		8.	•Initial management (for the first 12 months) of the landscaped components of the modified CBMD will be undertaken by the Consortium, following which management will revert to the City of Belmont/WAWA.			

ISSUES	OBJECTIVES	No	COMMITMENTS	WHEN	BY WHOM	To whose satisfaction
5. Management of waterways water quality	•To ensure that water quality in the proposed channel system is maintained or improved over the long term and is consistent with water quality in the Swan River, so that the environmental values are protected. •Maintain the capacity of the channel to flush as originally designed.	9.	•Commitments for long-term management of waterways will be finalised once the Consortium confirm acceptance of approval conditions of PER.		•Consortium	•Minister for Environment on advice from SRT and DEP, and Department of Transport (DOT).
		10.	•Waterway management in the short term (first five years) will be the responsibility of the Consortium.	•For up to five years after completion of waterways construction.		
		11.	•The Consortium will prepare an EMP for the monitoring and management of the waterways and submit it to appropriate authorities for approval prior to implementation. The EMP is to include the following commitments: •investigation of water exchange characteristics; •investigation of effects of significant algal bloom; •regular monitoring (quarterly) of indicator water quality parameters; •monitoring of benthic recolonisation; •monitoring success of wetland vegetation establishment around foreshore; •bathymetric monitoring of channel sedimentation in spring; •monitoring of navigable depth, structural integrity of walls and beacons; •annual reporting of findings of above; •implementation of contingency plans in the event that water quality declines to levels unacceptable for indirect recreational use (boating) and maintenance of the waterway ecosystem; •monitoring and removal of rubbish; •management plan for marina. •Maintenance of flushing capacity to original design standards as specified in the PER.	•The EMP is to be submitted and approved prior to the start of dredging.		
		12.	•Implement the approved EMP.	•For up to five years after completion of waterways construction.		DEP, SRT, DOT

ISSUES	OBJECTIVES	No	COMMITMENTS	WHEN	BY WHOM	To whose satisfaction
6. Contingency plans in event of decline in waterways water quality	To ensure that a contingency plan is in place to remediate a decline in water quality in the proposed channel so that the beneficial uses/environmental values of the river are protected.	13.	•A contingency plan will be prepared to specify the inspection and monitoring programme and the remedial measures to be undertaken in the event of: •malodours caused by stratification and anoxia; and •floating algal scum caused by significant algae bloom.	•The contingency plan is to be submitted and approved prior to the start of dredging.	Consortium	Minister for Environment on advice from SRT and DEP, and DOT.
		14.	•Implement the approved contingency plan if required.	•Construction/post construction		
7. Mosquitoes	•To control the breeding of mosquitos without adversely affecting other flora and fauna.	15.	•Prepare a physical mosquito control strategy in conjunction with the City of Belmont and the Health Department, and submit to the SRT/DEP for approval prior to implementation.	•The mosquito control strategy is to be submitted and approved prior to the start of dredging.	Consortium	•City of Belmont, Health Department, SRT and DEP, and Consortium.
		16.	•To implement approved mosquito control strategy including: •construction works; •monitoring result of works; and •reporting details of completed works and monitoring results.	•Commence by the end of summer 1996.		°City of Belmont, Public Health Department, SRT and DEP.
8. Landscape amenity		17.	•Prepare a Landscape Master Plan. The landscape master plan is to include the following: •the location and design of all waterway and wetland foreshore edges prior to implementation. •the revegetation of the tip site .	•The Landscape Master Plan is to be submitted and approved prior to the start of dredging.	Consortium	•MfP and SRT with appropriate consultation from DOT and WAWA (floodplain).
		18.	•Implement the approved Landscape Master Plan.	•During construction		°MfP and SRT.

ISSUES	OBJECTIVES	No	COMMITMENTS	WHEN	BY WHOM	To whose satisfaction
9. Management of artificial wetlands		19. 20.	•Prepare an EMP for the management of fresh water wetlands within the residential component of the development •To implement EMP, including: •monitoring of water quality; •implementation of contingency plans in event water quality declines; •monitoring success of vegetation establishment around foreshore.	•The EMP is to be submitted and approved prior to the start of dredging. •For five years subsequent to completion of landscaping.	Consortium	•DEP, City of Belmont and WAWA.
10. Aboriginal community.		21.	•Establish an ongoing consultation programme with the local community and a monitoring programme to identify any archaeological sites, should any be discovered, during the earthworks period.	•During construction.	Consortium	•MfP and Department of Aboriginal Affairs.
11. Construction management		22.	•Implement acceptable site supervision and construction/management including all regulatory requirements for construction activity, and to ensure that all specific commitments (e.g. dredge spoil disposal) provided in the PER and subsequent documentation provided by the Consortium are adhered to.	•Project planning and during construction.	Consortium	•SRT, DEP and City of Belmont.