



State of Environment Report & Environmental Action Plan

2008-2009



Foreword

Rockingham is one of the fastest growing local government areas in the State, presenting many new opportunities and challenges. One of those challenges is protecting our environment, whilst providing and managing the benefits of growth. The Council has initiated many projects to help safeguard our environment, one of the most important being State of Environment Reporting. These reports provide valuable information on how our natural environment is faring, across a range of different issues, and how well it is being managed. With this information, the Council can then allocate resources to those areas of highest priority.

The Council has released full State of Environment Reports in 2001 and 2005 and interim 'Report Cards' in 2003 and 2007 and is proud to release this State of the Environment Report 2008/2009 and Environmental Action Plan for public comment as a further step in our on-going commitment to the protection and improvement in the quality of the Rockingham environment.



Barry Sammels
MAYOR OF ROCKINGHAM

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Report Format

This report has four main sections:

The Overview is the introduction to the report, and contains important background information including the public consultation process already used to provide input into the report.

Report Card Summary provides a snapshot of the status of the issues contained within the report and highlights any changes in status since 2007.

The Issues Section provides a detailed description of the pressures the environment is under, and an overview of the response by the City to these pressures. Ten key environmental priority issues are identified along with some key indicators of how the environment is performing. An assessment (score card) of how the environment is performing, the pressures it is under and the quality of the City's responses is also given for each issue. A list of relevant actions Council has committed to is also listed. Progress since the first State of the Environment Report and Interim Report is also discussed.

The Environmental Action Plan is the consolidated list of actions reported in the Issues Section. This is the Environmental Action Plan that the City will implement to address the key environmental priority issues. This Action Plan also shows an audit of progress made since the 2005 State of the Environment Report.

Overview

Purpose

State of the Environment (SoE) Reporting is an internationally and nationally recognised tool designed to communicate credible, timely and accessible information about the condition of the environment to decision makers and the community¹. It also provides a means of monitoring the performance of government and policies against actual environmental outcomes. The 2008/2009 SoE Report and Environmental Action Plan (EAP) does not consider all of the many environmental issues facing the City, rather it focuses on the major environmental issues, so as to draw attention on them and to help guide the City's environmental objectives over the next four years.

The key objectives of the 2008/2009 SoE include:-

- Provide all stakeholders with accurate, timely and accessible information about the condition of and prospects for the local environment;
- Increase public understanding of environmental issues;
- To facilitate the development and review of set environmental indicators;
- Provide an early warning of potential problems;
- Report on the effectiveness of policies and programmes designed to respond to environmental change;
- Contribute towards achieving ecological sustainability;
- Contribute to the assessment of progress in protecting biological diversity and maintaining ecological processes and systems;
- Provide a mechanism to integrate environmental information with social and economic information as part of broad decision making;
- Identify gaps in the knowledge of environmental conditions and recommend strategies for research and monitoring to fill these gaps;
- Fulfil national and international environmental reporting obligations; and
- To help decision makers to make informed judgments about the environmental consequences of social, economic and environmental policies and plans.

History

The City of Rockingham has a long history of managing and improving the quality of the local environment. In 1998 a strategic approach to environmental protection was initiated with the release of a 'Discussion Paper on the Environmental Priorities for Rockingham'. This paper was released as part of the preparation of the City's Forward Plan.

The key objective set for the environment at that time was to "plan and manage development to achieve an optimal balance between the natural and built environment to provide a high standard of health, safety and wellbeing for the community".

Council commissioned a survey of residents as part of the Forward Plan and sixty two percent of people that responded to the survey identified health and the environment as being important. The survey was also used to generate a list of the most important local environmental issues. Another outcome of the survey was strong support for the preparation of an EAP for Rockingham to deal with the key environmental issues.

¹ Environmental Protection Agency, WA (2007)

The City recognised that for the EAP to be effective, baseline information was needed on the state of Rockingham's environment so that limited resources could be targeted to the areas of most need. The City of Rockingham resolved to prepare a SoE Report to provide this baseline information.

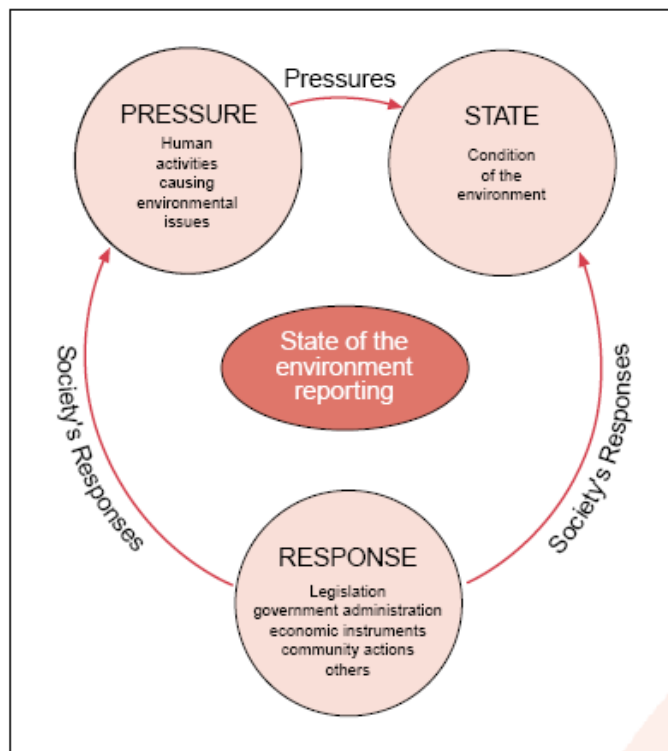
Council consulted widely during the preparation of the initial report, including holding two public workshops and calling for written submissions. A final report was released in 2001 containing an EAP.

Since this time the City has carried out a major review in 2005, issued two updates of the SoE, in the form of a report card, in 2003 and 2007 and has just completed a full review of the SoE and EAP which has produced this document.

Reporting Framework

The Australian Organisation for Economic Co-operation and Development's 'Pressure-State-Response' model provides a framework for the City's SoE reports. 'Pressure' (or threat) refers to human activities that affect the environment, 'State' (or condition) refers to the quality of the environment and the functioning of important environmental processes and 'Response' (or actions) refers to initiatives that have been made to address pressures on the environment or to improve or maintain its condition.

Figure 1: The pressure–state–response model used in State of the Environment reporting²



Similar to many other SoE reports, the City's reports are structured around environmental issues and indicators. 'Issues' refer to major groupings of the environment, including Heritage, Atmosphere, Land Management, Inland Waters, Bushland, Coastal Foreshore, Coastal Waters, Energy, Waste and Noise.

Within each issue there are environmental indicators used to provide a summary measure of the changes and/or trends in the environment or for environmental issues. An assessment is also given on Council's response to these pressures on the environment.

² Department of Environmental Protection, WA (1998)

SoE reports provide the information base on which Council's environmental management decisions have and will be made.

The EAP is an implementation plan for the priority environmental issues identified (and their associated environmental management decisions), and is intended to link the EAP into the City's strategic decision making and funding streams. This last link is an important one as it provides the mechanism to integrate environmental actions and reporting into the Council's normal budgeting and business planning process.

It is the intention of the City of Rockingham, through this and future SoE Reports, to provide up-to-date information to the public about the environment and increase awareness of the environmental issues of importance within the City.

Report Review Process

The review of the SoE was undertaken over a period of 18 months and involved the use of a consultant, ENV. Australia to aid in the update of the SoE with regard to the public and internal consultation components of the review. Council staff completed the other processes of the review. The main steps or processes involved in the SoE review included the update of indicators, internal and public consultation and the writing of the draft SoE. Council has adopted a seven step process for reviewing the SoE and EAP, as follows:

- Update indicators and other data including description of the environment;
- Prepare a Summary Document to facilitate input into the review;
- Public consultation;
- Environmental Action Plan internal consultation;
- Prioritisation of environmental issues;
- Draft SoE and EAP Report are released for public comment; and
- State of the Environment Report and Environmental Action Plan are adopted by the Council and released.

Update Indicators and Data

This step involved reviewing and updating the indicator data up to June 2009. New information and reports that had been released since the release of the interim SoE Report Card in 2007 were also analysed and incorporated into indicators and issues, where relevant. This process was undertaken in July and August 2009.

Summary Document

This document was a 60 page summary of the issues and current indicators as well as an introduction to the review process. It was distributed to both provide information on the review, and to stimulate discussion on the key issues. It was released in October 2009 and was made available from a range of sources, including:

- Council Administration Offices;
- The Naragebup Rockingham Regional Environment Centre;
- All Public Libraries in Rockingham;
- City of Rockingham Website;
- 'Talk Back Rockingham', an online community forum; and
- The Rockingham Spring Festival.

The availability of the Summary Document was advertised in local papers, on the City of Rockingham Website and 'Talk Back Rockingham'. It was also tabled at the Community Environmental Advisory Committee (CEAC) for discussion and to gain comments from this group.

Public Consultation on Summary Report

This consultation was facilitated by ENV with the aid of Council staff and focused on the review and prioritisation of the environmental issues contained within the SoE and provided an assessment of the state of the environment, based on the updated indicator data. This information was collected on a survey sheet that provided space for the prioritisation of the issues as well as a report card to rate the state of the environmental issue, the pressure on that issue and the Councils management response to the pressure.

The comprehensive consultation process was established involving:-

- Releasing the Summary Document;
- Newspaper advertisements seeking comment and inviting people to attend an open Public Consultation Forum;
- Information placed on the City of Rockingham Webpage and 'Talk Back Rockingham' website;
- Displays at all public libraries in Rockingham, in the foyer of the Council Administration Building and at Naragebup Rockingham Regional Environment Centre;
- A Public Consultation Forum in which community members rated and discussed the environmental issues of most importance to them;
- Written public submission; and
- Briefing given to CEAC.

The public consultation period on the issues within the SoE began on the 20th October 2009 and closed on the 20th November 2009. During this time there were a total of 19 submissions, including 15 comment forms. Through the 'Talk Back Rockingham' website there were 429 unique visits to the site with the most popular issue viewed (by number of 'hits') being Coastal Foreshore, followed by Bush land and Heritage. There were no official comments received directly through the site, although five Comment Forms were downloaded.

General Comments

Some general comments with regard to the public consultation process were received:

- Residents indicated that more hard copies of the SoE Summary Report 2008/9 should have been made available to workshop attendees; and
- Community members complimented the City and ENV on the Community Workshop.

Summary

Community members appreciated the opportunity to make their opinions known and contributed accordingly. Across all issues, they identified the need for more actions, as opposed to management plans.

The majority of indicators are to be retained, including those which are new to the 2008/9 SoE Summary Report, with some to be modified to give a better indication of the state of the environment in the City.

Residents would like to see greater focus on sustainability in the City and they appreciated the opportunity to have their say during the consultation process.

More detailed information on the comments received is shown within the relevant issue in the report.

CEAC Consultation

The Community Environmental Advisory Committee (CEAC) is Council's peak advisory body on environmental matters affecting Council, and is made up of 10 community representatives.

This committee provided input into the review process on two occasions: at the commencement of the public consultation process, and prior to the release of the draft report. On the second occasion, CEAC reviewed the results of the public consultation and provided advice to Council on the review of the key environmental priorities and assessment of the state of the environment.

Environmental Action Plan Internal Consultation Workshop

An internal Consultation Workshop was held with relevant staff invited to aid in the update of the EAP. Each department updated information of actions completed or being undertaken to date and provided information on upcoming actions.

Prioritisation of Environmental Issues

Taking into account the comments and written submissions received during the Public Consultation Period the priority ranking of the Environmental Issues has changed.

2005 Issue Rankings

1. Inland Waters
2. Energy
3. Bushland
4. Noise
5. Coastal Waters
6. Coastal Foreshore
7. Atmosphere
8. Land Management
9. Waste
10. Heritage

Current Issue Rankings

1. Bushland
2. Coastal Foreshore
3. Inland Waters
4. Coastal Waters
5. Waste
6. Energy
7. Land Management
8. Atmosphere
9. Heritage
10. Noise

Public Consultation on Draft Report

Council endorsed the Draft SoE and EAP 2008/2009 in April 2010 and released the document for public comment on the 30th April for a period of one month.

The public comment period was advertised in the following ways:-

- Newspaper advertisements;
- Information placed on the City of Rockingham website; and
- Displays at all public libraries in Rockingham, in the foyer of the Council Administration Building and at Naragebup Rockingham Regional Environment Centre.

At the conclusion of the comment period, a total of three written submissions were received; two relating to water quality testing in Lake Richmond and the other providing general comments on many issues contained within the draft Report, including the effectiveness of the Report Card analysis, the City's actions in relation to the clearing of bushland, marina developments and 'inappropriate development' causing risk to the environment.

During the consultation period, one of the local community papers ran a story on the release of the draft SoE, with the headline of 'Environment in Decline'. The article claimed that the condition of the environment in the City was in decline and that the Council's management of the Issues within the SoE Report were not seen as adequate by the public.

Lake Richmond Water Quality Testing

The management and water quality testing of Lake Richmond was raised as a prominent issue to the community, particularly the length of time between water quality testing events and the impacts of future development in proximity.

Officer Comment

As outlined within the SoE Report, the City's Urban Wetland Monitoring program was designed to ascertain nutrient levels in constructed water bodies. Lake Richmond has not traditionally been part of this program as it is not constructed, but a naturally occurring wetland.

It has been noted, however, that the alignment between the Indicators within the State of Environment Report and the monitoring program could have been better explained.

The water quality testing of Lake Richmond is identified in the EAP as part of the Lake Richmond Management Plan 2008. This Plan recommends that the City monitor the water quality in Lake Richmond and a monitoring regime will be commencing in late 2010.

It is also noted that recent monitoring of the water quality in Lake Richmond, that has been undertaken as part of the Environmental Impact Study for the proposed Cape Peron Marina, shows very little change since the 2003 monitoring was carried out.

As the City is currently implementing the Lake Richmond Management Plan 2008 as per the EAP, it is recommended that no changes be made to the Report relating to this matter.

Other General Submission

Concern was raised that various actions associated with some Issues is inadequate to meet the objectives within the SoE. The submission also stated that with the increased attention that some of these issues now receive, such as vegetation clearing, climate change, pollution, fisheries, waste and recycling and sustainability, the community expectations of the Council is increasing.

Other comments related to Bushland, Coastal Waters and Waste, and the effectiveness of the Indicators used for these Issues. The submission also contended that where an Indicator did not highlight a particular trend or data was not available for an update, it is an inadequate Indicator.

Another comment suggested that programmes and initiatives undertaken by the Council in relation to Waste, Energy and Land Management were considered inadequate to respond to the seriousness of the Issue.

Officer Comment

The Report Card analysis for some of the Issues was not reflective of the Council's actions or responses but instead gave an indication of the community's perception of the current management of environmental issues within the City, as ascertained through the initial Public Consultation.

It is considered that the actions are generally adequate, however, the adequacy will be monitored over time and adjustments made if required, bearing in mind that the City does not have the sole responsibility for many of the Issues.

For all the Indicators used within the SoE, a target or direction has been defined which is the direction that the Indicator should be moving if the impacts on the environment are to be reduced. These Indicators were chosen as a way to highlight, in the simplest manner, the potential impacts within an Issue. Highlighting a negative trend or not showing a trend does not necessarily deem them insufficient, but may lead to a review of the Indicator in due course. It can be difficult to find sufficient data to support some of the Indicators, and where there is insufficient data, this is acknowledged along with the potential source or method of data collection for future use.

All of the programmes and initiatives undertaken by the Council on each Issue are shown within the EAP, along with progress and future works to be undertaken. In the majority of cases there has been progress made within the action and the aims of these actions are being achieved. In cases where this has not occurred since the Interim Report, the need to monitor the actions within the EAP has been noted.

The submission highlighted that the link between the Indicators and the EAP needs to be clearly shown in subsequent reports as some of the points and questions raised by the submissioner were dealt with within the EAP. It is also necessary to better communicate the actions and function of the City with respect to environmental management and a Communication Strategy, which provides a more systematic response to this matter, is currently being formulated.

Community Newspaper Article

The article 'Environment in Decline' referred to the Council's management of issues within the SoE as being inadequate, and highlighted areas of public concern, including bushland clearing, climate change, acid sulfate soils and land contamination.

Officer Comment

The adequacy of the Council's response, as identified in 'Table 2: Report Card Summary' of the SoE indicates that the Council's management and policy responses are shown as being adequate across seven Issues (Bushland, Coastal Foreshore, Inland Waters, Energy, Land Management, Atmosphere and Heritage) and more than adequate across three Issues (Coastal Water, Waste and Noise). The article was therefore factually incorrect and this matter has been brought to the attention of the local Community Newspaper.

Other Comments

During the course of the consultation period, the following changes were noted by Council Officers:

Issue 6 - Energy, Indicator 6.3 - Public Transport Patronage

Amended the boardings per capita as the calculations were incorrect in the draft Report.

Issue 10 - Heritage

Removed 'Listing of heritage sites in Town Planning Scheme (TPS)' action, as it duplicates the information contained within the action 'Review Municipal Heritage Inventory and the Heritage List'.

Summary

It could be assumed, due to the low number of responses to the draft SoE and EAP, that the public is generally satisfied with the management of the environment within the City.

The EAP contains relevant actions to ensure that the management of the various Issues is adequate and will bring about positive changes to the environment. The City must now ensure that the actions contained within the EAP are regularly implemented and monitored.

This SoE has brought into question aspects of the process, particularly those associated with the ranking of the City's environmental management performance and the suitability of certain Indicators. This matter will be considered further and it is possible that a more balanced and pragmatic process will be recommended for future SoE reporting.

Report Summary

Prioritisation of Environment Issues

Table 1 lists the major environmental issues, the relevant objectives, a description and management issues. The issues have been categorised into three levels of priority from highest priority, high priority and medium priority based on community feedback during the public consultation and review period for this report.

Table 1: Environmental Priority Issues, Management Issues and Priority Ranking

Overall Priority	Environmental issue	Objectives	Description and management issues
Highest Priority	Bushland	To identify and protect areas of locally significant bushland within the City of Rockingham. To identify areas of cleared land suitable for rehabilitation with native species.	Management of Council reserves containing bushland and helping private landowners protect and manage their bushland, where possible; Management of weeds and feral animals including cats.
	Coastal Foreshore	To manage the coastal foreshore environment so as to protect important conservation areas whilst providing suitable recreational opportunities.	Condition of our beaches and coastline; Managing the level of tourist and recreational activities; the stability of the dunes; Protection of coastal vegetation; Managing parking and access to avoid impacts on foreshore
High Priority	Inland Waters	To reduce the impact of existing and proposed developments on wetland water quality, important wetland habitats wetland processes, geomorphology and flora. To encourage water conservation so as to protect our limited groundwater resources.	Management of wetlands, including lakes, sumplands, damplands, palusplains and watercourses, including acid sulphate soils; Management of private and Council water usage and conservation; Management of groundwater resources.
	Coastal Waters	To manage the impacts of existing and proposed developments on the water quality of the coastal waters and important marine habitats, including sea grasses, to ensure conservation values are protected;	Management of water quality in the marine environment, especially nutrients and bacteria; reduce impacts on marine flora and fauna.
	Waste	To increase the participation rates of both corporate and community recycling actions. To decrease the per capita volume of waste generated.	Reducing the volume of waste generated and increasing the percentage of waste recycled
	Energy	To reduce Corporate Greenhouse Gas emissions and work with the Community to reduce Greenhouse Gas emissions. To identify and implement appropriate options for the application of alternative energy sources and to promote increased actions of energy efficiency.	Reducing Council's Greenhouse Gas emissions through energy saving programmes and use of alternative energy sources; Encouraging Community Greenhouse Gas reduction.
	Land Management	To work with all stakeholders to identify areas of degraded land and to put in place conservation and repair measures to rehabilitate those areas. To manage the impacts of new land uses with the capacity to cause degradation so that environmental impacts are minimised	Further improve management of land clearing and development; Further improve management of soil erosion and salinity; Management of weeds; Recognition of the role of primary (rural) industries in the landscape.
	Atmosphere	Work with regulatory agencies to improve air quality where breaches of statutory levels area recorded.	Managing local sources of odour, smoke and dust and air quality from local and neighbouring industries.
Medium Priority	Heritage	To protect and Preserve Aboriginal and Non-Aboriginal Heritage sites.	Aboriginal and Non-Aboriginal Heritage including the built environment.
	Noise	To work with regulatory agencies and Industry to reduce noise levels where breaches of statutory levels are recorded.	Managing the level of noise (particularly North-east Rockingham) by working with the Department of Environment and Industry.

Report Card Summary

Table 2 presents the synopsis of the City's Environmental Issues covered in this report in 2009. The City has considered a number of indicators relating to the condition of the issue, the pressures or threats present and the adequacy of current responses. 'Status' refers to the current overall condition of the issue, while the 'trend' refers to the change in status since 2007.

Table 2: Report Card Summary

	State of the environmental issue	The pressure the issue is under or exerts on the environment	Adequacy of Council's management & policy responses
Bushland	-	-	-
Coastal Foreshore	▼	-	▼
Inland Waters	▼	-	▼
Coastal Water	▼	-	-
Waste	▼	-	-
Energy	▼	-	▼
Land Management	▼	-	▼
Atmosphere	-	-	-
Heritage	▼	▲	▼
Noise	▲	▲	-

Status Key

Good		Adequate		Poor
Low		Medium		High
Well Managed		Managed		Poorly Managed

Trend Key

- ▲ Improvement in status
- ▼ Deterioration in status
- No change in status since 2007

Issue Structure

Each Issue contains the following information:

- A description of the issue;
- Environmental indicators of the health of the environment,
- An assessment of the state of the environment; and
- An Environment Action Plan initiative to address outstanding environmental problems.

The Scope of each Issue is limited to:-

- The elements of the City's environment that Council has direct responsibility for (e.g. coast, approvals on private land, Council Reserves; and
- Areas where the Council does not have direct responsibility, but does have a strong interest in (for example air quality, marine water quality and industrial noise).

Environmental Indicators

Environmental indicators are physical, chemical, biological or socio-economic measures that can be used to assess environmental quality. An environmental indicator has two functions, one is to reduce the number of measures that would normally be required to give a precise representation of a situation, and secondly to simplify the way the results of measurements are provided to the user³.

An ideal indicator will:

- Be simple;
- Be measurable (at a reasonable cost);
- Show any change over time;
- Give a picture of environmental condition, or a pressure on the environment, or society's response to an environmental issue; and
- Indicate a desirable improvement level that may be achieved for greater sustainability (i.e. if the indicator is increasing/decreasing the system is likely to be moving towards/away from being sustainable)⁴.

The reality is that no indicator can do all of these, all the time. In fact, it is more probable that only a few of these can be achieved for any environmental indicator. For each indicator used in this Report a target or direction has been defined, this is the direction that the indicator should be moving if the impacts on the environment are to be reduced and sustainability is to improve⁵.

It can be difficult to find sufficient data to support some of the indicators. Where there is insufficient data, this is indicated, along with the potential source or method of data collection for future use. Wherever possible, existing data or data that is easy to collect and process has been used.

³ Fairweather, P. and Napier, G. (1998)

⁴ Fairweather, P. and Napier, G. (1998)

⁵ Fairweather, P. and Napier, G. (1998)

Report Card Assessment

The assessment is illustrated in the form of a Report Score Card, which looks like this:

Figure 2: Report Card Format

State of the environmental issue		The pressure the issue is under or exerts on the environment		Adequacy of Council's management & policy response
 Good Poor		 Low High		 Well Managed Poorly Managed
Example Only		Example Only		Example Only

As can be seen, the City makes an assessment of the state of the environment, the pressure the environment is under and the adequacy of the management/policy response.

In an ideal situation, all arrows would be leaning to the left. Arrows leaning to the right suggest that there are growing or significant management issues that require attention. A dashed arrow (as shown in the third box) is used where the information is inconclusive and a preliminary assessment is suggested.

The assessment in this Report was carried out by the Community Environmental Advice Committee (CEAC), and by those community members who submitted a comment form to Council during the consultation period for this report.

The assessment provided in 2007 is shown as a red arrow and the current assessment is shown in black.

Issue 1 – Bushland

Description of Issue

Removal of native vegetation is a major threatening process affecting biodiversity in Western Australia. This includes the traditional concept of clearing for development, but also involves other substantial damage to native vegetation (e.g. burning, overgrazing and draining or flooding of land) which results in the removal of at least some native vegetation, and can result in degradation or loss of whole ecosystems⁶.

Widespread clearing of native vegetation has occurred within Rockingham to accommodate a growing population and developing industries. Clearing of native vegetation across Western Australia is now regulated under the Environmental Protection Act 1986 unless exemptions apply. Between 2001 and 2005 the cities of Wanneroo and Rockingham had the highest areas of native vegetation cleared (over 1100 and 800 ha respectively) as a result of housing and infrastructure development⁷.

Removal of large areas of native vegetation fragments the landscape leaving behind small and unconnected stands of remnant vegetation. As a result many flora and fauna communities are threatened, often resulting in diminished biodiversity and extinctions in some areas. Clearing in Rockingham has resulted in other environmental issues including enhanced spread of weed species and exacerbated soil erosion⁸. It is also believed that broad scale clearing in the South West of Western Australia may be responsible for reduced rainfall in cleared areas (due to a change in the land's surface and a reduced ability to form moisture-carrying clouds)⁹.

The City has recently undertaken an onground condition assessment of the biodiversity assets within the City in partnership with Ironbark Environmental. The assessment covered approximately 40 sites across the City and the information and data gained from this assessment will be used to insert firm targets for vegetation retention, protection and/or management into the City of Rockingham Local Biodiversity Strategy, which is due to be finalised in late 2010.

Threats

The key threats to bushland in Rockingham are:

- Clearing for development of urban areas, commercial infrastructure, industry and roads;
- Fire leading to the destruction of habitat and possible loss of species diversity; and
- Uncontrolled access to bushland which can destroy habitat, spread weeds and disease.

⁶ Environmental Protection Authority, WA (2007)

⁷ WALGA (2007)

⁸ Environmental Protection Authority, WA (2007)

⁹ Lyons (2002)

Indicators and Objectives

Table 3: Key indicators for 'Bushland'

No.	Indicator	Objective, Trend or Target
1.1	Native Vegetation - Proportion of rural zoned land remaining uncleared.	Maintain proportion of native vegetation on rural land.
1.2	Number of Heddle vegetation types with 10% remaining uncleared.	Maintain or increase number of Heddle Vegetation types with 10% uncleared in the City of Rockingham.
1.3	Number of approved management plans for conservation reserves (under CoR management).	Increase number of conservation reserves with management plans until all have plans.
1.4	Native Fauna - Rockingham bird survey results.	The diversity of birds measured in the survey (i.e. number of species) should remain the same or increase.

Indicators for Bushland

Indicator 1.1- Native vegetation - proportion of rural zoned land remaining uncleared

Indicator Description

There are large tracts of remnant vegetation contained within the Rural and Special Rural Zones of the City. The protection of this remnant vegetation is important for the biodiversity of the ecosystem as fragmentation and isolation may contribute to extinction or less viability of a species¹⁰.

Table 4 illustrates the amount of bushland remaining in the Rural Zone and Special Rural Zones within the City.

The 1999 data was collated by officers of the City, interpreting 1999 aerial photography and the 2005 data has been taken from the Perth Biodiversity Project¹¹, where aerial photography taken in 2001 was used to interpret the amount of remnant vegetation in the Rural and Special Rural zones.

Bushland mapping undertaken in 2008 indicates that there is 1,902 hectares of native bushland remaining on rural land. Approximately 62 hectares have been cleared between 2005 -2008¹².

Table 4: Proportion of Rural Zone land remaining uncleared

Year	Area of Bushland on Rural Land	% Land Uncleared
1999	Approximately 20,50ha (of 8,860 ha total)	23.10%
2005	1,964ha (of 9,982ha total)	19.70%
2008	1,902ha (of 10,300ha total)	18.40%

(Iron Bark 2008)

Indicator Trend

The objective is to "maintain the proportion of native vegetation on rural land". As shown in Table 4 the proportion of uncleared land remaining in the rural zone has decreased.

Effectiveness of Indicator

The indicator is effective.

¹⁰ Saunders, D. *et al* (1998)

¹¹ Del Marco, A., Taylor, R. *et al* (2004)

¹² Ironbark (2008)

Proposed Indicator Changes

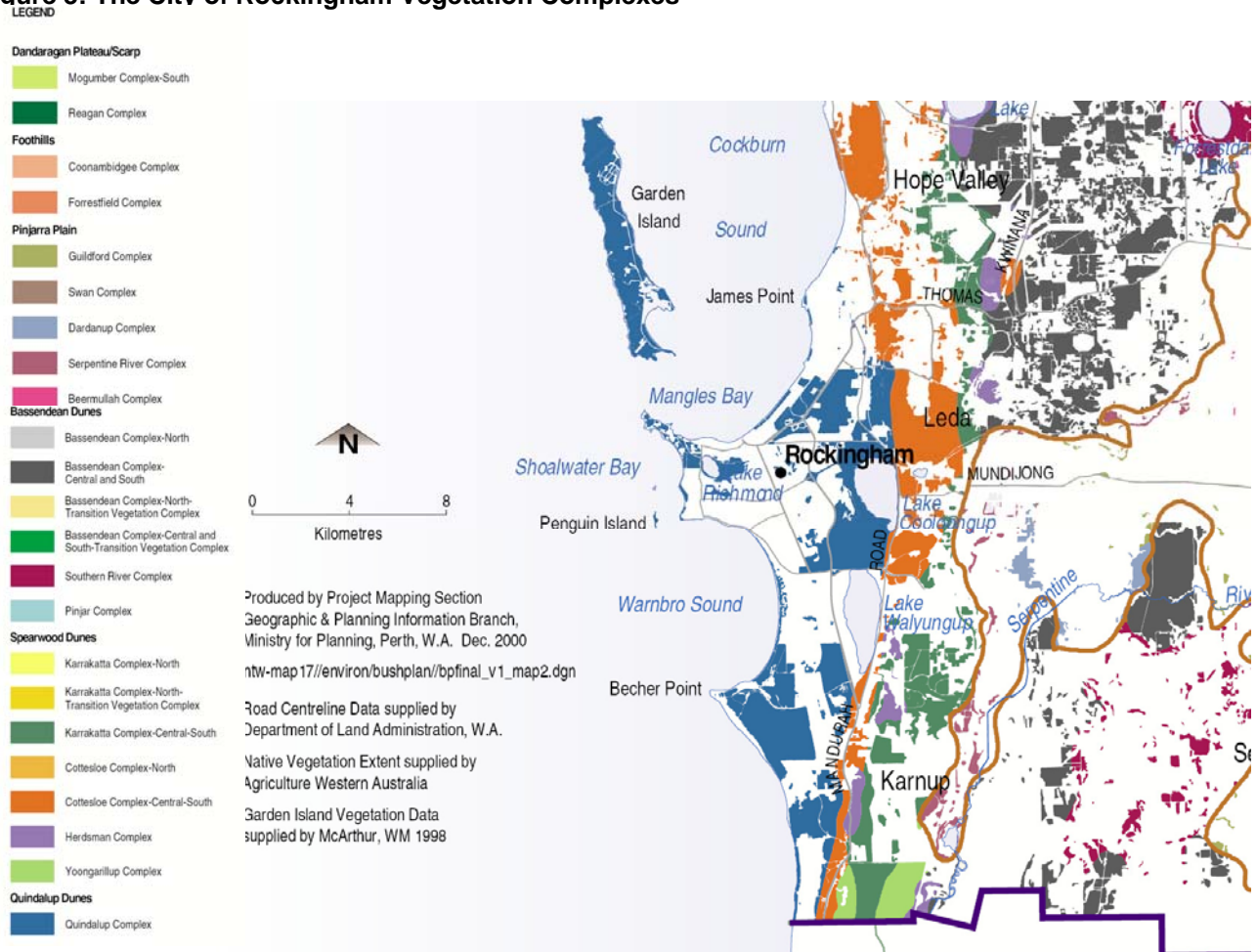
Nil.

Indicator 1.2 - Number of Heddle vegetation types with 10% remaining uncleared

Indicator Description

The Heddle system¹³ provides an overview of vegetation complexes relating to the major geomorphic units along the Perth Metropolitan Region. Figure 3 shows the location and extent of the remnants of these complexes in the City.

Figure 3: The City of Rockingham Vegetation Complexes¹⁴



The stable dunes of the Spearwood and Bassendean Systems support the highest diversity of plant species and include the occurrence of much taller trees. These areas are dominated by Jarrah-Tuart-Marri Woodland (with high occurrences of Casuarina and Banksia species).

Vegetation complexes within the Bassendean soils generally demonstrate higher distinction between the vegetation layers, supporting a high degree of diversity in the middle layer strata such as Banksia and Sheoak. Further inland, the fringes of the Serpentine River and the Pinjarra Plain tend to be characterised by a combination of flooded gum and paperbark woodlands.

¹³ Heddle, Lonergan *et al*, 1980

¹⁴ Ministry for Planning, WA, 2000

Table 5 below highlights percentage of Heddle vegetation types remaining within the City.

Table 5: Percentage of Heddle Vegetation Complexes remaining uncleared within the City of Rockingham

Vegetation Complexes (Heddle, Longeragan et al. 1980)	Original area of complexes (ha)	Remaining area of complexes 1997 (ha)	% of original complexes remaining 1997	Remaining area of complexes 2001 (ha)	% of original complexes remaining 2001	Remaining area of complexes 2008 (ha)	% of original complexes remaining 2008	Change
Pinjarra Plain								
Guildford	641	6	0.9	6	0.9	6	0.9	No change
Dardanup	879	144	16.4	145	16.5	145	16.5	No change
Serpentine	3,658	333	9.1	333	9.1	332	9.0	Slight decrease
Bassendean Dunes								
Bassendean (Central & South)	1,976	106	5.3	105	5.3	108	5.4	Slight Increase
Spearwood Dunes								
Karrakatta (Central & South)	4,276	1,564	36.6	1,552	36.3	1,350	31.6	Decrease
Cottesloe (Central & South)	2,017	1,022	50.7	1,011	50.1	920	45.6	Decrease
Quindalup Dunes								
Quindalup	9,799	3,976	40.7	3,731	38.1	3,172	32.4	Decrease
Marine Deposits								
Yoongarillup	664	479	72.1	476	71.7	475	71.5	Slight decrease
Wetlands								
Herdsmen	532	323	60.7	326	61.3	324	60.9	Slight decrease

(Source: Ironbark 2008)

Over the past 10 years there has been a decrease in the amount of remnant vegetation within the City. Out of the nine regional complexes, six (Serpentine, Herdsmen, Cottesloe, Karrakatta, Quindalup and Yoongarillup) have decreased in hectares, while 2 complexes (Dardanup and Guildford) have remained the same. Only one (Bassendean) has slightly increased.

Bassendean Central and South, Guildford, and Serpentine complexes have all fallen below 10% of their original extent within the City, and are now considered rare.

It should also be noted that five of the nine vegetation complexes that occur within Rockingham are protected at less than 10% in the Perth Metropolitan Region; this includes the Guildford, Dardanup, Serpentine River and Bassendean complexes. This highlights that priority needs to be given to these complexes due to their regional significance¹⁵.

Indicator Trend

The objective is to "Maintain or increase the number of Heddle vegetation types with 10% uncleared in the City of Rockingham"; this objective is not being met.

Effectiveness of Indicator

The indicator is effective.

Proposed Indicator Changes

Nil.

¹⁵ City of Rockingham, 2002

Indicator 1.3 - Number of approved management plans for conservation reserves (under CoR management)

Indicator Description

Natural areas are managed for their cultural, environmental, ecological, recreational, and biodiversity values with the aim to conserve and protect the following:

- Native wildlife, habitats and significant vegetation;
- Sources of clean drinking water;
- Places of historical or scientific interest; and
- Areas for passive recreation activities that have minimal environmental impact.

The City has responsibility for the management of a number of natural areas primarily for conservation purposes, as identified in the "Vegetation Survey and Prioritisation of the City of Rockingham Reserves" Report conducted by Ecoscape in April 2007; these include:

- Baldivis Nature Reserve;
- Karnup Nature Reserves;
- Baldivis Tramway reserve;
- Lewington St Buffer Reserve;
- Mandurah Hill Reserves;
- Koorana Primary School Reserve;
- Port Kennedy Primary School Reserve;
- Kerosene Lane Reserve;
- Caranja Reserve;
- Marillana Conservation Buffer Reserve;
- Baldivis Children's Forest;
- Karnup Townsite;
- Stakehill Reserve;
- Sawley Close Reserve;
- Rockingham Road Conservation Reserve;
- Port Kennedy Nature Reserve 1;
- Port Kennedy Nature Reserve 2;
- Folly Road;
- Mandurah Hill;
- Tuart Park; and
- Alf Powell Reserve.

Table 6 indicates the number of management plans that have been produced for the City's Bushland Reserves as indicated above. The year of endorsement by Council for each plan is also shown.

Table 6: Major Bushland Reserves with approved Management Plans

Year endorsed by Council	No of Bushland Reserves with Management Plans	% Bushland Reserves with Management Plans	Name of Management Plan
2000	3	14%	Baldivis, Karnup, and Tramway Reserves
2001	4	19%	Lewington St Buffer Nature Reserve
2002	5	23%	Mandurah Hill Reserves
2003	7	33%	Koorana and Port Kennedy Primary School Reserves
2004-2005	8	38%	Baldivis Children's Forest
2005-2006	8	38%	N/A
2006-2007	8	38%	N/A
2007-2008	8	38%	N/A

Indicator Trend

The objective is to “Increase the number of conservation reserves with management plans until all have plans”. Although the data in Table 6 indicates that no new plans have been endorsed by Council since 2005, this does not indicate a lack of progress on this indicator. For example, action plans for existing management plans may be being implemented or management plans could be in draft form awaiting endorsement.

Effectiveness of Indicator

The indicator is not effective.

Proposed Indicator Changes

Modify this indicator to monitor the progress of the implementation of the management plans as listed in Table 6.

Indicator 1.4- Native Fauna - Rockingham Bird Survey Results

Indicator Description

As part of a metropolitan wide survey on bird populations, the Perth Biodiversity Project undertook bird surveys for local government areas over the 2003 to 2004 period. The City of Rockingham accounted for four sites from a total of seventy-eight local government reserves throughout the Metropolitan Region. Findings from these surveys are shown in Table 7.

Table 7: Numbers of Bird Surveys and Species for the Local Government Area of Rockingham

Site ID No.	Reserve Name	Wetland/dampland	Total surveys	Total Bird Species	Total water dependent species	Total breeding species	Total significant bird species
67	Baldivis Nature Reserve	-	11	43	2	4	12
68	Karnup Nature Reserve and Tramway Reserve	-	16	49	3	4	17
69	Tamworth Hill Swamp	-	11	47	2	4	15

(Source: Cole, 2004)

In 2006, the Perth Biodiversity Project undertook additional bird surveying, to that undertaken in 2003/2004 in local government areas across the Perth Metropolitan Region. This survey investigated 43 sites from 19 local government reserves. The City of Rockingham accounted for three of the 19 reserves surveyed; the results of this survey are listed in Table 8.

Table 8: Numbers of Bird Surveys and Species for the Local Government Area of Rockingham 2006

Site ID No.	Reserve Name	Wetland/dampland	Total surveys	Total Bird Species	Total water dependent species	Total breeding species	Total significant bird species
67	Baldivis Children's Forest	-	11	48	0	0	19
68	Lewington Reserve	-	11	34	0	0	10
69	Woodleigh Grove Reserve	-	10	32	0	0	12

(Source: Cole, 2006)

Indicator Trend

The objective is for “The number of bird species measured in the survey to stay the same or increase”. There is no update on this indicator, as there has not been a comprehensive review of the data undertaken by the State Government.

Effectiveness of Indicator

N/A

Proposed Indicator Changes

Nil.

Progress and Council Actions

The City is currently progressing with the following actions with relation to Bushland:

- A review of actions from the Perth Biodiversity Strategy to update the City of Rockingham Local Biodiversity Strategy and Action Plan; and
- There is continuing liaison between the City and developers with relation to the protection and promotion of the Baldivis Tramway Reserve.

NB. Biodiversity Grants scheme is currently on hold as the money has been diverted to the Rockingham Biodiversity Strategy. The allocation of funds for this programme will be reviewed in 2010.

Assessment – Report Card

Indicator Progress

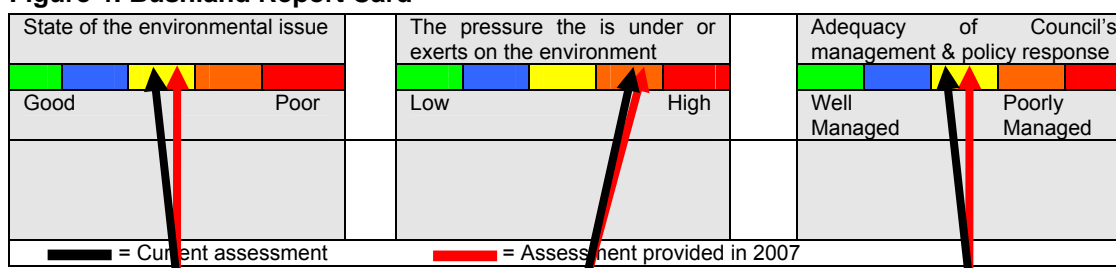
Table 9 highlights the progress made on the indicators for Bushland.

Table 9: Indicator Progress

No.	Indicator	Objective, Trend or Target	Progress
1.1	Native Vegetation - Proportion of rural zoned land remaining uncleared.	Maintain proportion of native vegetation on rural land.	The amount of vegetation remaining uncleared is decreasing due to pressure from development.
1.2	Number of Heddle vegetation types with 10% remaining uncleared.	Maintain or increase number of Heddle Vegetation types with 10% uncleared in the City of Rockingham.	The amount of vegetation remaining uncleared is decreasing due to pressure from development.
1.3	Number of approved management plans for conservation reserves (under CoR management).	Increase number of conservation reserves with management plans until all have plans.	There have been no additional Management Plans endorsed by Council. Although this does not indicate that work is not being carried out in this area.
1.4	Native Fauna - Rockingham bird survey results.	The diversity of birds measured in the survey (i.e. number of species) should remain the same or increase.	No data available to update trend.

Assessment

Figure 4: Bushland Report Card



Community Comments

Community members feel that bushland is a high priority issue and would like to see the City engaging in actions that protect and maintain bushland, rather than maintaining grassed parks. The clearing of vegetation for development, was a major concern, especially high value conservation areas and impacts on Bush Forever sites. Some of the indicators for this Issue were deemed inadequate as no clear trends or negative trends were defined.

Community members would like to see more maintenance of bushland areas, particularly:\

- Weed management;
- Keeping trail bikes out of bushland;
- Waste management;
- Revegetation; and
- Appropriate fire management.

There was concern regarding household practices impacting on bushland, such as:

- Domestic cats;
- Non-native gardens; and
- Illegal dumping of green waste.

Conclusion

The 'State' of this issue has remained constant and the 'Pressure' is still high. The 'Adequacy' of Council's response remains steady, with room for improvement based on the feedback gained during the consultation period. This assessment is most likely related to the fact that some of the indicators may show no discernable progress or are unable to be updated at this time rather than the inadequacy in the City's response to the issue.

Environmental Action Plan

Table 10: Bushland Environmental Action Plan

Action	Aim	Responsibility	Priority	Progress 2007	Progress to 2009	Further Action
Management plans						
Develop an inventory of the CoR conservation reserves with current management plans and track progress of implementation.	To ensure conservation objectives are met.	City of Rockingham - Engineering & Parks; Strategic Planning and Environment.	High	Implementation on going.	Inventory has been developed.	Management plans to be updated over time and actions implemented.
Progress implementation of the Tramway Management Plan.	To fulfil Management Plan objectives.	City of Rockingham - Engineering & Parks.	Medium		Have currently completed revegetation in 3 sections of the Baldvis Tramway Reserve in cooperation with subdividers and developers.	Continue to liaise with developers with relation to the protection and promotion of the Baldvis Tramway Reserve in addition to CoR management.
Extend management responsibility for Dixon Road as part of Rockingham Lakes Regional Park (RLRP).	To ensure Dixon Road bushland is managed appropriately.	City of Rockingham - Strategic Planning and Environment; Engineering & Parks.	Medium	Awaiting finalisation of the Rockingham Lakes Regional Parks Management Plan.	Council endorsed content of Rockingham Regional Lakes Management Plan in May 2008, and awaiting final management plan from DEC.	Potentially CoR will take on responsibility for Lot 902, Bush Forever site as an offset for Mundijong Rd - will require upgrade the wetland, potentially take on management of Dixon Road and Tamworth if Area Assistance Grant from the WAPC is forthcoming.
Undertake a study into the nature and extent of the feral animal problem in Council managed Reserves.	To ensure that the biodiversity of Council Reserves is not compromised through feral animals.	City of Rockingham - Strategic Planning and Environment; Engineering & Parks.	Medium	New Action.	Anecdotal information has been provided by officers that undertake onground work and from the community.	There are no immediate plans to undertake a formal investigation.
Develop and implement a local strategy to manage the impacts of weeds in the agricultural area.	To control weed spread and the disturbance of weeds in the agricultural area.	City of Rockingham - Engineering & Parks; Strategic Planning and Environment.	Medium	New Action.	Draft weed strategy was developed and adopted in 2008.	Implementation of weed strategy in Rural area.
Investigate potential additional weed management actions for City managed street verges.	To manage weed spread and the potential disturbance of weeds on street verges.	City of Rockingham - Engineering & Parks.	Medium	New Action.	Verges that abut significant bushland have weed control strategies and management undertaken, including private verges if evident that a resident isn't undertaking maintenance.	Undertaken as part of general maintenance programme.
Identify and prioritise degraded bushland with potential for rehabilitation.	To identify and protect Bushland in the City of Rockingham.	City of Rockingham - Strategic Planning and Environment; Engineering and Parks.	Medium	Completed Prioritisation of Reserves Report. Need to discuss further with Parks Service.	Local Biodiversity Strategy provided an indication of the condition of vegetation within the City & prioritised vegetation complexes.	Specific actions from Biodiversity Strategy currently under review.

Action	Aim	Responsibility	Priority	Progress 2007	Progress to 2009	Further Action
Bushland in the Rural Zone						
Develop management plans to conserve those areas of remnant vegetation identified in Perth's 'Bush Forever' and vested with the City.	To protect regionally significant vegetation vested in the City.	City of Rockingham - Strategic Planning and Environment.	Medium	SPP (draft) has been released requiring Local Governments to complete Management Plans - ongoing.	Management Plan required when development abuts Bush forever site, not at other times.	Local Biodiversity Strategy has prioritised bushland in the City and specific actions will be developed when this is reviewed.
To work with State Government to find an appropriate means of protecting regionally significant bushland on privately owned land.	To protect regionally significant vegetation vested in the CoR.	City of Rockingham - Strategic Planning and Environment.	Medium	Ongoing liaison and implementation with DOP to protect various regionally significant vegetation sites (i.e. Doghill Road Mgt Plan and Stakehill Swamp).	On a case by case basis.	Nil.
To work with Perth Biodiversity Project to find an appropriate means of protecting locally significant vegetation on privately owned land.	Encourage retention of locally significant vegetation that is on privately owned land.	City of Rockingham - Strategic Planning and Environment.	High	Still contributing to the Perth Biodiversity Project.	Still ongoing; 12 months additional funding obtained in 2009.	Review of the Perth Local Biodiversity Strategy and the development of a City of Rockingham Local Biodiversity Strategy will aid in the identification and retention of significant bushland.
Continue to monitor the impacts of trail bikes and 4WD vehicles and take action to prevent their improper use in bushland areas.	To prevent disturbance to bushland areas through unauthorised 4WD and trail bike use.	City of Rockingham - Rangers Services.	High	Monitoring.	General patrols and immediate investigation of any reports of unauthorised 4WD and trail bike use.	Nil.
Continue to offer grants for the better management of weeds through the Biodiversity Grant Scheme.	To offer incentives to private landowners to manage weeds in Rural areas.	City of Rockingham - Strategic Planning and Environment.	Medium	Biodiversity Grants Programme continuing.	Project on hold for 2009. Money has been reallocated to be used for Biodiversity Project.	To be reviewed in 2010.

Issue 2 - Coastal Foreshore

Description of Issue

In Rockingham the coastal foreshore provides opportunities for community and tourist recreation activities. The management of the foreshore area is important so as to maintain biodiversity values and ensure the dune system is stable to allow these activities.

Coastlines are dynamic and can go through cycles of erosions, stability and accretion. The coastline in Rockingham has been modified in a number of locations to help protect roads and houses from erosion. Most of the Becher Plain has been modified to accommodate housing, shopping areas and recreation nodes. In older suburbs, minimal setback from the coast was provided, however, most of the recent developments along the coast have been planned with some research into historical movements of the beach zone and consequently housing has been located in areas with low potential for change¹⁶ (Figure 5).

Figure 5: Foreshore setback



In addition, despite the controlled access paths to the beach for recreational uses, degradation of the dunes and coastal habitat destruction through trampling and the spread of non-indigenous plants is an ongoing problem within the foreshore areas¹⁷, as shown in Figure 6.

¹⁶ City of Rockingham, 2003

¹⁷ City of Rockingham, 2008

Figure 6: Coastal erosion caused by uncontrolled access

Due to the human pressures on the natural beach and foreshore processes, management of these foreshore reserves is a priority for the City. Currently, management plans are required to be prepared and implemented for all urban development that has coastal frontage. The Rockingham Foreshore Strategy¹⁸ has replaced the pre-existing Foreshore Appraisal¹⁹, and has seen the development of a number of management proposals and additional recommendations for identified sections of the coastline.

The City has a number of conservation nodes within its foreshore reserves whilst others cater for recreational activities. These 'nodes' have been designated for the purpose of providing habitat and shelter for coastal fauna as well as retaining the natural aesthetics of the coastal vegetation. This form of development provides a sustainable way of managing community use of the foreshore whilst protecting the coastal biodiversity.

Threats

The key threats to the coastal foreshore are:

- Increased demand to build coastal infrastructure (paths, playgrounds, toilet blocks, car parks etc);
- Increased number of users, both local residents and visitors to the City;
- Changing coastal processes; and
- Climate change.

¹⁸City of Rockingham, 2003

¹⁹ City of Rockingham, 1995

Indicators and Objectives

Table 11: Key indicators for 'Coastal Foreshore'

No.	Indicator	Objective, Trend or Target
2.1	Proportion of coastal reserve with current Approved Management Plan	Increase number of coastal reserves with Management Plans
2.2	Progress of the implementation of the Rockingham Foreshore Strategy	Progress actions in Rockingham Foreshore Strategy until all are completed.
2.3	Progress of the Implementation of the Kwinana Beach Foreshore Management Plan.	Progress actions in Kwinana Beach Foreshore Management Plan until all are completed.

Indicators for Coastal Foreshore

2.1 - Number of coastal reserves with current approved management plans

Indicator Description

The implementation of management plans for coastal reserves is essential if these areas are to be managed sustainably. The proportion of the coast with a current management plan is a good measure of the health of the City's coastal foreshores. Table 12 summarises the number of Coastal Management Plans within Rockingham.

Table 12: Number of coastal reserves with management plans

Year Endorsed by Council	Number with Plans	Name of Management Plan
Up to 2000	6	Warnbro Foredunes Management Plan St Clair Foreshore Management Plan Secret Harbour Foreshore Management Plan Bayshore Gardens Foreshore Management Plan Rockingham Regional Lakes Management Plan (part of Kennedy Scientific Park) Rockingham Foreshore
2001	7	Mersey Point Reserves Management Plan
2002	10	Rockingham Main Drain Coast and Clean Seas Project Palm Beach Coast and Clean Seas Stormwater Project, Palm Beach Catchment Strategic Drainage Management Plan
2003	11	Rockingham Foreshore Strategy
2004/2005	12	Secret Harbour Groundwater Resource Review
2005/2006	13	Update of Rockingham Foreshore Strategy
2006/2007	13	Nil
2007/2008	14	Kwinana Beach Foreshore Management Plan

(Source: City of Rockingham 2009)

Indicator Trend

The objective is to "Increase area of coastal reserve with management plans". The City has met its objective with the addition of The Kwinana Beach Foreshore Management Plan.

Effectiveness of Indicator

The indicator is effective.

Proposed Indicator Changes

Nil.

Indicator 2.2 - Progress of the implementation of the Rockingham Foreshore Strategy

Indicator Description

The Rockingham Foreshore Strategy 2003²⁰ was developed in consultation with the community and presents a series of aims, objectives, and guidelines for the management and conservation of coastal foreshores within the City of Rockingham.

Table 13: Summary of Actions from the Rockingham Foreshore Strategy

Sector	Action	Status
Industrial	Northern boundary with the Town of Kwinana nourished with sand and vegetated	Completed - Beach renourished, interpretive aboriginal walk trail, a revegetation plan has been developed.
	Vehicle tracks across and through dunes should be ripped, brushed, closed off. Signs erected	Scheduled for 2009/2010.
	Dual use pathway	Not fully connected, some parts completed.
	Horse beach parking fenced to prevent vehicles entering dunes	Completed.
	Horse beach parking resurfaced in limestone	Completed.
Naval Heritage		
	Signs requesting people to stay off dunes	Ongoing.
	Alignment for dual use pathway with Rockingham Beach Road	Completed.
	Power Lines placed under ground	Still with Western Power.
	Dead vegetation south of Alexandra Street should be replanted	Completed.
	Weld Street parking fenced, sealed and brought back from dune ridge	Completed.
	Upgrade of informal parking areas, Victoria, Hillman, and Roe Streets	Completed.
	Oleander shrubs along Rockingham Beach Road to be removed	Pending.
	Small toilet block at Victoria Street to serve Wanliss Street Jetty proposal	Pending.
	Dual use path made continuous through this sector	Completed.
Rockingham Foreshore		
	Beaches between Hymus and Wanliss Streets should be renourished	Completed.
	Immediate area in front of the Millennium ball and limestone/grass terrace should be renourished	Completed.
	Stormwater drains that discharge onto the beach should be eliminated	Completed Bell & Churchill Parks drainage works.
	Toilet blocks that block ocean views should be relocated to more appropriate places, when due for redevelopment	Toilet block sunk at Alexander and Victoria Street.
Sector	Action	Status
	Coastal grasses not mulch should be used for stabilising sand	Completed.
	Public artwork utilised	Julia Street toilet block, Hawker Lake toilet block.
	Lighting should be in accordance with the CoR Community Safety and Crime Prevention Plan	Ongoing.
Rockingham Foreshore	Beaches between Hymus and Wanliss Streets should be renourished	Completed.
	Proposed disabled access ramp at Fisher Street Jetty should be constructed	Completed.
Cape Peron		
	Sand bypass system at the causeway, alternatively accretion of sand at this point should be trucked for soil remediation	Ongoing.
	Access roads and parking areas need to improved by responsible management authority	Completed.
	Natural vegetation in this area continue to improve by replanting	Completed.
	Dual use pathways constructed to connect Hymus Street	Completed.

(Source: City of Rockingham 2009)

Indicator trend

The objective is to "Implement recommendations of the Rockingham Foreshore Strategy". The information in Table 13 highlights that the City is progressively meeting this objective.

Effectiveness of Indicator

The indicator is effective.

²⁰ City of Rockingham, 2003

Proposed Indicator Changes

Nil.

Indicator 2.3 - Progress of the implementation of the Kwinana Beach Foreshore Management Plan**Indicator Description**

The Kwinana Beach Foreshore Management Plan 2008²¹ was endorsed by Council in September 2008. The Management Plan actions are scheduled to commence in 2010 and will be progressively carried out over the next five years. The progress of these actions will be presented in the next Interim Report.

Indicator Trend

The objective is to "Implement recommendations of the Kwinana Beach Foreshore Management Plan".

Effectiveness of Indicator

NA.

Proposed Indicator Changes

New indicator.

Progress and Council Actions

The City is currently progressing with the following actions with relation to the Rockingham Coastal Foreshore:

- Continued implementation of both the Rockingham Foreshore Strategy and Kwinana Beach Management Plan, including dune rehabilitation, planting and stabilisation; and
- Involving schools in coastal rehabilitation and education through the CoastCare Adopt-a-Beach programme.

Assessment – Report Card**Indicator Progress**

Table 14 highlights the progress made on the indicators for Coastal Foreshore.

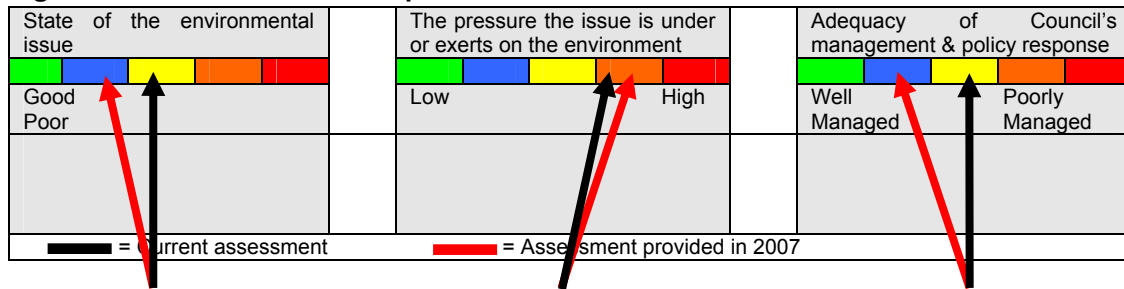
Table 14: Indicator Progress

No.	Indicator	Objective, Trend or Target	Progress
2.1	Proportion of coastal reserve with current Approved Management Plan	Increase number of coastal reserves with Management Plans	The number of coastal reserves that have Management Plans is increasing.
2.2	Progress in the implementation of the Rockingham Foreshore Strategy	Progress actions in Rockingham Foreshore Strategy until all are completed.	Actions from the Rockingham Foreshore Strategy are progressively being completed.
2.3	Progress of the Implementation of the Kwinana Beach Foreshore Management Plan (Proposed Indicator)	This is a new indicator.	No update as this is a new indicator.

²¹ City of Rockingham, 2008

Assessment

Figure 7: Coastal Foreshore Report Card



Community Comments

Community members feel that coastal foreshores are a priority and under considerable pressure. There is concern regarding the implementation of management plans and a number of suggestions for particular actions to be included in management plans, including better management of trail bikes and four wheel drives. .

Conclusion

The 'State' of the issue has deteriorated and the 'Pressure' on the issue has remained high. The perceived 'Adequacy' of Council's response to the issue has fallen based on the comments received, although there has been substantial works undertaken in this area. This would indicate that there is a need to better promote what the City can provide, or undertakes in relation to climate change.

Environmental Action Plan

Table 15: Coastal Foreshore Environmental Action Plan

Action	Aim	Responsibility	Priority	Progress 2007	Progress to 2009	Further Action
Prepare and implement detailed Foreshore Management Plan(s) following/as part of review and in accordance with the City of Rockingham Foreshore Strategy.	To ensure Rockingham's entire foreshore is managed appropriately.	City of Rockingham - Engineering & Parks and Strategic Planning and Environment.	Medium	Funding for facilities and foreshore development is being progressively implemented as part of the 5 year Parks development and city projects programme.	Implementation strategies are being developed for all local beach precincts to aid in identification, reporting process & the management of the Regional Foreshore Reserve. This includes restricted access to occur on beach paths, brushing, planting strategies; and Adopt a Beach Programme for schools.	Continue with development of Implementation Strategies.
Continue to monitor the impacts of trail bikes and 4WD vehicles and take action to prevent their improper use in coastal foreshore areas.	To prevent disturbance to coastal foreshore areas through unauthorised 4WD and trail bike use.	City of Rockingham - Rangers Services.	High	Ongoing.	General patrols and immediate investigation of any reports of unauthorised 4WD and trail bike use.	Continue patrols and investigation of reports.

Issue 3 - Inland Waters

Description of Issue

The term 'inland waters' refers to watercourses, such as the Serpentine River and its associated floodplain, wetlands, lakes, damplands, sumplands and groundwater²².

Within the City inland waters are fundamental for:

- Sustaining native flora and fauna;
- Sustaining biodiversity, habitats and ecosystems;
- Regulating water quality;
- Facilitating social and economic benefits; and
- Underpinning a diverse array of recreational, spiritual, scientific, and cultural values²³.

Wetlands

Rockingham has a series of wetland chains²⁴ that run roughly parallel to the coastline, as shown in Figure 9. The wetland chains are essentially associated with three major geomorphic units:

- Quindalup Dunes: examples include Lake Richmond, Becher Wetlands, Peelhurst Wetlands, Anstey Q and Turtle Swamp (as shown in Figure 8);
- Spearwood Dunes: examples include Tamworth Hill Swamp, Outridge Swamp, Stakehill Swamp, Churcher Swamp, Anstey Swamp and Paganioni Swamp; and
- Pinjarra Plain: examples include Folly Pool, Maramanup Pool, Beenyup Swamp and the river side flats of the Serpentine River.

*Note: Lake Coo loongup and Lake Walyungup are located between the Quindalup and Spearwood Dunes.

Figure 8: Hidden Swamp – wetland in the Quindalup Dunes at Secret Harbour

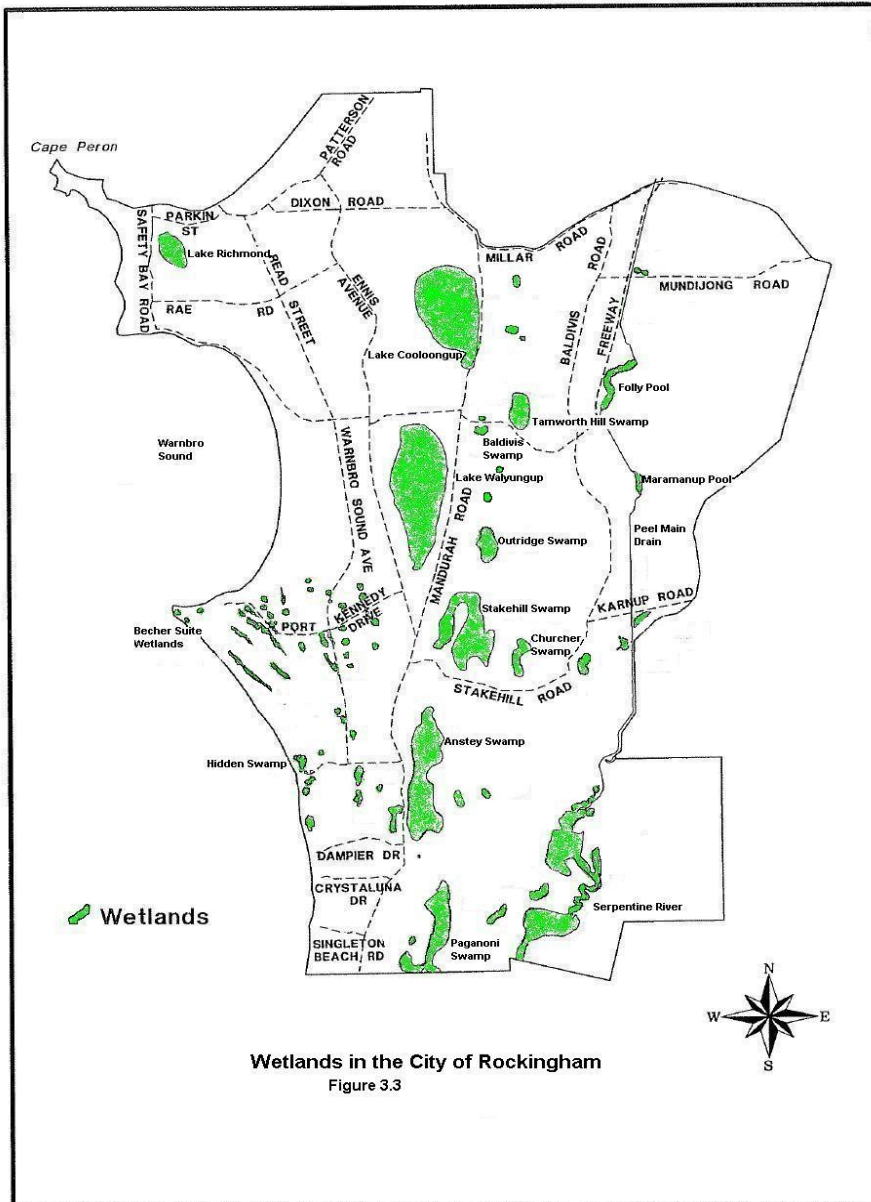


²² Fairweather, P. and Napier, G., 1998

²³ Environmental Protection Authority, WA, 2007

²⁴ Semeniuk, 1992

Figure 9: Location of Major Wetlands within the City of Rockingham



(Source: Alan Tingay & Associates 1997)

The wetlands within each geomorphic unit express different characteristics, even where they exist in close proximity. For example, Lake Richmond is permanently wet, whereas Lake Coo loongup and Lake Walyungup are only seasonally inundated. It is the difference in landform (cross-sectional shape) as well as water permanence that classifies a wetland into particular wetland type.

This classification system, developed by C A Semeniuk (1987) identifies three categories of landform (basins, flats and channels), with three categories of water permanence (permanent inundation, seasonal inundation, and seasonal water logging).

These landform/water combinations describe the seven commonly found types of wetlands; lakes, sumplands, damplands, palusplains, floodplains, rivers and creeks²⁵.

The types of wetlands that occur in Rockingham include:

- Lakes: Permanently inundated basin (e.g. Lake Richmond);
- Sumplands: Seasonally inundated basin (e.g. Stakehill Swamp);
- Damplands: Seasonally waterlogged basin (e.g. Peelhurst Wetlands);
- Flood Plains: Seasonally inundated flat (e.g. Serpentine River flats);
- Palusplain: Seasonally waterlogged flats (e.g. waterlogged pasture flats); and
- Rivers: Permanently inundated channel (e.g. Serpentine River);

There are also numerous artificial channels, or man made drainage channels (e.g. Peel Main Drain)²⁶.

Groundwater Mounds

There are two significant superficial groundwater mounds within the City, the Stakehill and Safety Bay Mounds. The Stakehill Mound covers 153km² with a water bearing thickness of 15-20m. It is located between the Serpentine River and Mandurah Road. The mound is recharged directly from rainfall and discharged through evaporation from wetlands, transpiration by vegetation and to the Serpentine River. The Safety Bay mound covers about 50km². Its centre is between the Coast and Lake Cooloongup and Lake Walyungup, with its discharge and recharge similar to the Stakehill Mound²⁷.

Both aquifers are used extensively for private abstraction for horticulture and domestic uses in the rural areas.

Threats

The key threats to inland waters are:

- Nutrients and contaminated water entering wetlands via surface flow and ground water;
- Decreasing rainfall;
- Spread of weeds due to vehicle access, horses and urban development; and
- Vegetation clearing increased nutrient loads, increased risk of fire and increased rubbish due to urban development.

Indicators and Objectives

Table 16: Key indicators for 'Inland Waters'

No.	Indicator	Objective, Trend or Target
3.1	Number of approved management plans for wetlands within the City.	Increase the number of management plans for wetlands, until all have plans.
3.2	Water quality in Lake Richmond and other urban wetlands	Water quality to be within ANZECC guidelines.
3.3	Percentage of groundwater available, based on sustainable yield.	To not exceed the sustainable yield of the aquifer.
3.4	Monitor wastewater discharge from industry and small to medium enterprises.	Ensure compliance with regulatory compliance levels.

²⁵ Environmental Protection Agency, 2007

²⁶ Semeniuk, 1992

²⁷ Department of Water, 2008

Indicators for Inland Waters

Indicator 3.1 - Number of Approved Wetlands with Management Plans within the City of Rockingham

Indicator Description

The term 'wetlands' refers to lakes and sumplands (permanently and seasonal inundated basins), damplands (seasonal waterlogged basins), and palusplains (seasonal waterlogged flats). Wetlands are highly productive ecosystems supporting an abundance of flora and fauna, providing habitat, breeding grounds and food sources²⁸.

The City is responsible for the management of a number of wetlands and the effectiveness is measured by the number of major wetlands* that have management plans, as shown in Table 18.

Table 18: Approved Wetlands Management Plans within the City of Rockingham

Year	Number with Plans	% with Plans	Name of Management Plan
Up to 1998	4	13%	Lake Amarillo, Folly Pool (portion of), Beenyup Pool
1999	6	20%	Cud Swamp, Anstey Swamp
2000	8	26%	Hollow Swamp, Baldivis Swamp
2001	10	33%	Hidden Swamp, Tamworth Hill Swamp
2002	12	40%	Mundijong Clay Pits, Kennedy Park, Dress Circle Damplands
2003	12	40%	N/A
2004	12	40%	N/A
2005	13	43%	Lark Hill Sumpland
2006	13	43%	N/A
2007	13	43%	N/A
2008	13	43%	N/A
2009	14	46%	Lake Richmond

(Source: City of Rockingham 2009)

(*Major Wetlands are considered to be: Lake Richmond, Lake Coo loongup, Lake Walyungup, Mundijong Wetlands, Wellard Wetlands, Folly Pool, Tamworth Hill Swamp, Hollow Swamp, Baldivis Swamp, Outreach Swamp, Stakehill Swamp, Churcher Swamp, Young Road Swamp, Freeway Swamp, Port Kennedy Dampland, Lark Hill Sumpland, Beenyup Swamp, Anstey Swamp, Cud Swamp, Hidden swamp, Anstey Q, Turtle Swamp, Small Swamp, Fletcher Road Swamp, Lake Amarillo, Zed Swamp, Paganoni Swamp, Keralup Swamp, Serpentine River, Peel Main Drain²⁹)

NB: Baldivis Children's Forest and River Gums Estate were previously included in this table, but were removed in 2007 as they are not wetlands and are now covered in Issue 1 Bushland

²⁸ DEWHA, 2009

²⁹ Semeniuk, 1992

Indicator Trend

The objective is to “increase the number of wetland management plans for major wetlands* within the City, until all have plans”. The number of management plans has increased and the City is progressively meeting its objective.

Effectiveness of Indicator

The indicator does not reflect the City's management and conservation initiatives for wetlands that retain ecological, social, and biodiversity values but were not identified in the 1992 Semeniuk Report as being significant.

Proposed Indicator Changes

A review of the list of ‘major wetlands’, as identified in 1992, to be carried out to incorporate any additional sites that have been identified as major or significant since 1992 and reported on in the in the next Interim Report.

Indicator 3.2 - Water quality in Lake Richmond and other urban wetlands

Indicator Description

Water quality can be used as an indicator to assess the health of a wetland against recognised guidelines. Lake Richmond has been chosen as an indicator wetland, as it is a significant wetland in an urban setting³⁰. The other wetlands used in this indicator were specifically chosen as they were identified in the City's Urban Wetlands Study, 2004³¹ and the Urban Wetland and Drainage Swale Study 2008³², as having management issues, are highly modified or constructed wetlands, and are representative of wetlands in the City within urban settings.

The City has conducted monitoring to aid in the management of these wetlands. These results and associated Australian and New Zealand Environment and Conservation Council (ANZECC) Guidelines are highlighted in Table 19. Whilst these are the guidelines for disturbed wetland ecosystems, they can also be used as indicators for wetlands in urban settings³³.

Table 19: ANZECC Water Guidelines (2000)³⁴

	TP – total phosphorus Micrograms per Litre (µg L-1)	FRP – filterable reactive phosphorus (µg L-1)	TN- total nitrogen (µg L-1)	NOX – oxides of nitrogen (reactive nitrogen) (µg L-1)
Freshwater lakes in slightly disturbed ecosystems (Lake Richmond)	10	5	350	10
Wetlands in slightly disturbed ecosystems (Urban Wetlands)	60	30	1500	100

³⁰ Semeniuk, 1992

³¹ ATA Environmental, 2004

³² GHD, 2008

³³ ANZECC, 1999

³⁴ ANZECC, 1999

Table 20: Water Quality of Urban Wetlands in Rockingham, 2003, 2006 & 2009^{35, 36 & 37}

Wetland	TN- total nitrogen (□g L-1)	NOX – oxides of nitrogen (reactive nitrogen) (□g L-1)	TP – total phosphorus Micrograms per Litre (□g L-1)	FRP – filterable Reactive phosphorus (□g L-1)								
	2003	2003	2003	2003								
ANZECC Guidelines	350	10	10	5								
Lake Richmond	650-840	12-258	12-30	7-12								
	2003	2006	2009	2003	2006	2009	2003	2006	2009	2003	2006	2009
ANZECC Guidelines	1500			100			60			30		
Rotary Park	1500	1950	1200	500	512	< 5	100	85	< 10	75	12.5	< 3
City Park	2600	2200	920	300	840	73	55	27	20	40	10	< 3
Hawker Reserve	7820	925	1800	< 10	22	< 5	170	40	40	20	<10	< 3
Don Cuthbertson	875	425	970	180	18	< 5	35	10	60	25	12.5	< 3
Sunlight Park	600	300	840	< 10	< 10	< 5	40	30	30	30	10	< 3
La Palma Square	< 200	900	NA	< 10	< 10	NA	40	30	NA	10	10	NA

NB – No water quality testing has been undertaken at Lake Richmond since 2003

Indicator Trend

The objective is to have the water quality in Lake Richmond and other urban wetlands "within ANZECC water quality guidelines". The water quality of the sample group of wetlands falls within ANZECC guidelines, as shown in Table 20.

Effectiveness of Indicator

Although no additional water testing has been undertaken at Lake Richmond since 2003, regular testing has been undertaken on wetlands that have been identified as having management issues, therefore the indicator is deemed to be effective.

Proposed Indicator Changes

Incorporate additional freshwater wetlands into the sample testing group under the same category as Lake Richmond to cover a greater sample group throughout the City, from the next Interim Report.

Indicator 3.3 - Percentage of available groundwater based on sustainable yield

Indicator Description

Groundwater is used for a range of applications throughout the City. The amount of water available for extraction is governed by licences issued by the Department of Water (DoW) under the Rights in Water and Irrigation Regulations 2000, and the Water and Rivers Commission Act 1995.

Table 21 shows the amount of groundwater extracted against its sustainable yield for the eight sub-aquifers within the City.

³⁵ City of Rockingham, 2004

³⁶ City of Rockingham, 2007

³⁷ Ecoscape, 2009

Table 21: Rockingham groundwater area allocations and use 1999 – 2009

	1999	2004	2007	2009			
	% of Allocation Used	% of Allocation Used	% of Allocation Used	Sustainable Yield (KL)	Licensed Allocation (KL)	Additional Allocation (KL)	% of Allocation Used
Maramanup	22.80%	94.65%		1486000	1222781	33900	84.57%
Tamworth	68.35%	67.45%	17.48%	3235000	2946515	61300	92.98%
Outridge	57.58%	74.93%	55.10%	2246000	2399481	220096	116.63%
Churcher West	54.10%	61.38%	74.86%	1506000	959475		63.71%
Churcher East				3525000	3702885	2625	105.12%
Karnup West	26.69%	69.18%	68.49%	832000	558555		67.13%
Karnup East				1544000	1705565		110.46%
Cooloongup	5.61%	4.45%	4.16%	272000	361900		133.05%
Rockingham				495000	917675	34400	192.34%
Stakehill				325000	23204	2064	7.77%
Warnbro	14.17%	31.78%	36.90%	6970000	4019182	303175	62.01%
Rockingham Total	29.33%	51.62%	14.62%	22436000	18817218	657560	86.80%

(Source: DoW 2009)

*2009 figures accurate as end July 2009 - these can change over a year based on licensing

Indicator Trend

The objective is to ensure that groundwater allocations “Do not exceed sustainable yield”. The information in Table 21 indicates that the objective has not been met for five of the sub areas in the Rockingham Area.

Effectiveness of Indicator

The indicator is effective.

Proposed Indicator Changes

Nil.

Indicator 3.4 - Monitoring of wastewater discharge on industry and small to medium enterprises to ensure compliance with regulatory compliance levels

Indicator Description

The Environmental Protection (Controlled Waste) Regulations 2004 require that industrial waste water be treated, via oil separators, in order to remove hydrocarbons and associated heavy metals before being discharged into the sewerage system or unsewered soak wells. DEC and the Water Corporation have set acceptable levels of hydrocarbons at below 30ppm for discharges to sewer, and 100ppm for discharges to soak wells^{38 & 39}.

In 2007 the City undertook comprehensive monitoring of businesses to assess regulatory compliance levels. Results indicate that a significant percentage of sites currently have discharges below 30ppm and 100ppm (Table 22).

³⁸ Water Corporation, 2008

³⁹ Department of Environment and Conservation, 2008

Table 22: Percentage of sites that meet regulatory compliance levels

Waste Water Discharge Destination	% below 100ppm		% below 30ppm	
	2008	2009	2008	2009
Sewered	47%	65%	29%	40%
Soakwell	73%	93%	34%	55%

(Source: City of Rockingham 2008)

Indicator Trend

The objective is to ensure that "all sites meet, and stay within, DEC and Water Corporation waste water discharge regulatory compliance levels". The information in Table 22 shows that the City is progressively meeting this objective.

Effectiveness of Indicator

The indicator is effective.

Proposed Indicator Changes

Nil.

Progress and Council Actions

The City is currently progressing with the following actions with relation to Inland Waters:

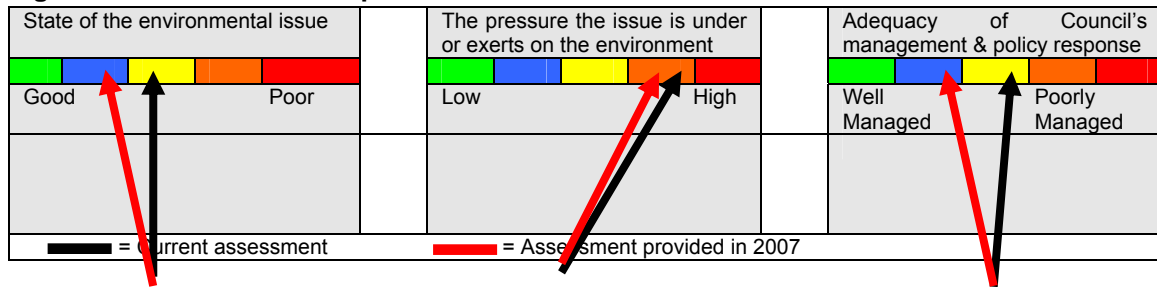
- Nutrient stripping in the Northern Inline Drain and Christensen Reserve;
- The level of the drain at Princeton Reserve has been raised;
- A letter drop have been carried out to houses surrounding Renegade Lake after high nutrient levels were detected; and
- Ground water around Lake Richmond is being monitored on an annual basis.

Assessment – Report Card**Table 23: Indicator Progress**

No.	Indicator	Objective, Trend or Target	Progress
3.1	Percentage of urban area unsewered.	To decrease the percentage of urban area not connected to reticulated sewerage.	Remove indicator as the Infill Programme has ceased in Rockingham.
3.2	Number of approved management plans for wetlands within the City.	Increase the number of management plans for wetlands, until all have plans.	The number of management plans has increased and the City is progressively meeting its objective.
3.3	Water quality in Lake Richmond and other urban wetlands.	Water quality to be within ANZECC guidelines.	The water quality of the sample group of wetlands falls within ANZECC guidelines, although no additional water testing has been undertaken at Lake Richmond since 2003.
3.4	Percentage of groundwater available, based on sustainable yield.	To not exceed the sustainable yield of the aquifer.	The objective has not been met for five of the sub areas in the Rockingham Area.
3.5	Monitor wastewater discharge from industry and small to medium enterprises.	Ensure compliance with regulatory compliance levels.	The City is progressively meeting this objective.

Assessment

Figure 10: Inland Waters Report Card



Community Comments

Community members would like to see more information about wetlands, including more monitoring, management plans, specific actions within wetlands and their surrounding environment and better restrictions on groundwater usage.

There are also valid concerns about the impact of development on inland waters and the creation and maintenance of buffers around wetlands.

Conclusion

The 'State' of the issue has deteriorated and the 'Pressure' on the issue has remained high. The perceived 'Adequacy' of the City's response to the issue has fallen, although there has been substantial works undertaken in this area.

Environmental Action Plan

Table 24: Inland Waters Environmental Action Plan

Action	Aim	Responsibility	Priority	Progress 2007	Progress 2009	Further Action
Monitor health of wetlands.	To ensure management plans are protecting wetlands and buffers.	City of Rockingham - Engineering and Parks; Strategic Planning & Environment.	Medium	A progress report on the monitoring has been completed. Currently hand over of this project from Parks to Environmental Planning being negotiated.	Urban Wetland and Drainage Swale Study completed in 2008 and the first round of monitoring was completed in Sept 2009 with additional sampling to take place at the end of summer 2010. Wetlands that are part of the monitoring regime were identified in the Urban Wetland and Drainage Swale Study 2008 as having management issues.	Recommendations from the monitoring reports are currently being undertaken by Engineering and Parks.
Develop & implement a Water Quality Management Plan for the Main Drains (with the Water Corporation).	To improve drain water quality and flow regime to improve water quality (and reduce the number of duck deaths).	City of Rockingham - Engineering and Parks; Water Corporation.	Medium	Vegetated buffers have been installed along the length of the Anchorage residential development, with designs developed in partnership between Australand & CoR.	Water Quality Management Plan not completed, but actions are mentioned in Lake Richmond Management Plan; predominantly Water Corporation land and hence their action is required.	Better partnership between CoR and Water Corporation needs to be built to ensure the Water Quality Management Plan for the Main Drains can be developed.
Complete and implement Wetland Management Plans for the City's wetlands.	To protect environmental values of the wetland including water quality.	City of Rockingham - Engineering and Parks; Strategic Planning & Environment.	High	All approvals now require development to prevent direct discharge into wetlands (in any form). Funding for storm water improvements on previous installations is now being undertaken on a staged basis.	Lake Richmond Management Plan has been accepted, not endorsed by Council; Engineering and Parks currently developing an Action Plan & Implementation Strategy for the Management Plan recommendations.	Completion of Action Plan and Implementation Strategy.
For Stakehill Swamp, identify wetland conservation areas that require management plans and develop and implement those plans by working with landowners and State Government.	To ensure Ongoing protection of the wetland and buffer.	City of Rockingham - Engineering and Parks; Strategic Planning & Environment.	High	The MRS Amendment process is yet to be completed. The Minister for the Environment has determined appeals associated with the Environmental Assessment, however the final boundary is of the reserve is yet to be determined. The Local Town Planning Scheme Amendment is being held pending the finalisation of the MRS reserve boundary.	MRS Amendment process is complete and the land has now been vested as Parks and Recreation Reserve and the wetland boundary defined; Wetland MP has yet to be completed.	Management Plan to be completed by the DOP or subsequent developer.

Action	Aim	Responsibility	Priority	Progress 2007	Progress 2009	Further Action
Use of education signage etc at wetlands.	To increase public awareness and understanding of wetland values/function.	City of Rockingham - Engineering and Parks.	Medium	Interpretive signage is being retrofitted to old lakes/wetlands and included in new developments adjacent to wetlands e.g. Lark Hill Sports Complex and Kennedy Bay.	Signage installation completed at Anstey Q & Larkhill.	On going in locations where needed.
Undertake actions to improve water quality in degraded Urban Wetlands.	To improve water quality in Urban Wetlands.	City of Rockingham - Engineering and Parks.	High	Parks Services have undertaken a programme with help from the local community to upgrade Reflection Mews lake. This involved planting, new water aeration equipment and delivery of brochures regarding nutrient management throughout the community. Grant obtained from Swan Catchment Council.	In Sunlight Park, St Raphael, Don Cuthbertson, Centenary park, Harmony Lake and St Clair works have been undertaken to improve water quality, have had aeration.	These actions are covered in an above action "Monitor Health of Wetlands". Remove action.
City of Rockingham representation on Peel Harvey Officers Group Committee and Water Sensitive Urban Design Peel-Harvey Committee.	To improve water quality in Peel-Harvey Catchment through subdivision and development.	City of Rockingham - Engineering and Parks.	Medium	On-going (irregular meetings).	On-going (irregular meetings).	In light of development near the Peel Harvey Inlet, investigations should be made to explore the value of returning to this group.
Investigate the issues of access, fire control and general management of wetlands within the Unexploded Ordinances (UXO) zone.	Ensure these issues affected by UXO are addressed adequately.	City of Rockingham - Engineering and Parks.	Medium	Survey undertaken and plan made outlining areas deep searched, surface searched and not searched.	UXO information has been updated and is available via the CoR website, along with a map of locations.	Nil.
City of Rockingham representation on Rockingham Lakes Regional Parks (RLRP) Community Advisory Committee to assist in ensuring that Lake Richmond and other areas of high scientific value are treated as high priorities for future management planning and implementation.	To ensure issues relating to local wetlands within the RLRP are addressed adequately and management plans developed.	City of Rockingham - Strategic Planning & Environment and Engineering and Parks.	Ongoing	Draft Management Plan for the Park remains incomplete.	Council endorsed content of Rockingham Regional Lakes Management Plan in May 2008, & awaiting final management plan from DEC. Potentially CoR will take on responsibility for Lot 902, Bush Forever site as an offset for Mundijong Rd - will require upgrade of the wetland & take over the land, potentially take on management of Dixon Road & Tamworth Swamp if Area Assistance Grant from WAPC is forthcoming.	Awaiting finalisation of plan by DEC and outcomes of WAPC Area Assistance Grants.

Action	Aim	Responsibility	Priority	Progress 2007	Progress 2009	Further Action
Liaise with the DoE to ensure that planning decisions take into consideration groundwater availability, the sustainable management of groundwater and the need for licensing of groundwater.	To maintain groundwater use within sustainable yield.	City of Rockingham - Strategic Planning & Environment.	Ongoing	Ongoing liaison on a case by case basis	Rockingham Stakehill Groundwater Resource Review is complete and this report identifies which aquifers within the Rockingham area are fully allocated.	CoR to report monthly on volumes used and currently looking at installing meters on every bore; June 2010 deadline for operating strategy to be complete. Monitoring to be reported quarterly.
Investigate potential impact of encroachment of saltwater.	To identify and prevent environmental impacts from saltwater encroachment	City of Rockingham - Engineering and Parks; Strategic Planning & Environment.	Low	The north-western movement of lake Cooloongup salinity plume has been identified and will continue to be monitored throughout the POS in Hillman and along the length of Dixon Road precinct.	Conductivity and water analysis monitoring is undertaken annually every November. There has been no change from previous results and hence there have been no additional actions.	Continue monitoring on an annual basis.
International Council for Local Environmental Initiatives (ICLEI) Water Campaign.	To consider Council's involvement in the ICLEI Campaign as part of efforts to improve water efficiency and use at the City.	City of Rockingham - Engineering & Parks; Strategic Planning and Environment.	Medium	Council has signed on to this programme. Inventory will be completed 2007/2008 Financial Year.	The City has completed Milestone 3 and are currently undertaking Milestone 4.	Preparation of Planning Procedure 1.7 - Water Sensitive Urban Design; community education on reduced water use and water wise initiatives; and adopting the Fertilizer and Herbicide Application Guidelines for Staff and Contractors.
Work with the Town of Kwinana and the City of Cockburn to develop a community education project related to urban nutrient management for both the Peel Harvey Catchment and the Cockburn Sound Catchment, and seek funds from Natural Heritage Trust for its implementation.	To control nutrient input into the Peel Harvey and Cockburn Sound Catchments.	City of Rockingham - Engineering & Parks; Strategic Planning and Environment.	Medium	The Peel Harvey Draft Policy is currently being reviewed. From this a review of the Cockburn Sound Catchment Policy will take place.	The City has adopted the Statement of Planning Policy 7.3 Local Planning Policy for the Cockburn Sound Catchment.	Cockburn Sound Management Council are due to review the Statement of Planning Policy 7.3 and provide feedback to the City.

Issue 4 - Coastal Waters

Description of Issue

The ecology of Rockingham's coastal waters is rich and diverse and there are important colonies of marine mammals such as the Australian Sea Lion (*Neophoca cinerea*) and sea birds such as Little Penguins (*Eudyptyla minor*). Forty five species of birds use islands in the South Metropolitan waters, and there are also twelve species of waders and divers that live in or visit the area and as mentioned previously, some of these migratory birds are protected by international agreements⁴⁰.

Since industrial and urban development, the coastal waters of Rockingham have suffered from nutrient enrichment, loss of seagrass meadows and a general reduction in water quality. Much of these environmental problems have been identified to be the result of discharge from industry, spillage of fuel, oil and sullage from sea crafts, emissions from engine exhaust, litter and finally from boat use in the form of moorings, anchors and landings all of which have the potential to disturb the healthy sea bed by scouring the sea floor⁴¹.

Water pollution of the Sound is largely a result of industry to the north of the City. Other forms of pollution to coastal waters on a local level include stormwater and groundwater inflow from residential areas and septic tanks. Over time, these issues are being addressed through infill sewage programs undertaken by the Water Corporation and improvements to the treatment of stormwater drains.

Cockburn Sound is currently the only area of the State's marine environment where the environmental quality management framework is being given effect through the State Environmental Protection (Cockburn Sound) Policy 2005⁴². Monitoring of Cockburn Sound is undertaken to determine if environmental values are being protected. The Cockburn Sound Management Council publicly reports the findings each year and has prepared State of Cockburn Sound reports in 2005, 2006, 2007 and 2008⁴³.

There are ongoing issues with sea grass shoot density in Cockburn Sound as plants are further apart than those in healthy ecosystems. This is consistent with research that shows that sea grasses in Mangles Bay and on the eastern side of Garden Island are highly stressed with low shoot density, height and biomass, and dead rhizomes in the sediment⁴⁴.

Generally, there are no contaminant issues of concern in Cockburn Sound. Chlorophyll a (used as an indicator of algal growth) levels have improved. Nutrient enrichment commonly results in increased abundance of algae in the water column (i.e. phytoplankton) and attached to the seabed and organisms that live there (i.e. epiphytes). The proliferation of phytoplankton and attached algae can reduce water quality and the health of benthic communities such as sea grass meadows, and lead to changes in marine ecology⁴⁵.

While Cockburn Sound is, in places, significantly compromised due to industrial activity and discharges, Warnbro Sound is in very good ecological quality condition.

The comparison between the two provides an interesting comparison of the impact of human activity on the ocean. Cockburn Sound once had extensive seagrass beds with a rich bottom dwelling and free-swimming aquatic life.

⁴⁰ City of Rockingham, 2005

⁴¹ Environmental Protection Authority, WA, 2007

⁴² Environmental Protection Authority, WA, 2005

⁴³ Environmental Protection Authority, WA, 2007

⁴⁴ Lavery & Westra, 2004

⁴⁵ Lavery & Westra, 2004

Warnbro Sound's biota is similar to those species found in Cockburn Sound, however intertidal and sub tidal reefs are far more prevalent. Water quality in Warnbro is better because of less human induced discharges and, because there are no major modifications to the beach line (e.g. groynes or breakwaters) the coastal sediment processes remain largely unaltered⁴⁶.

Threats

The key threats to Coastal Waters in Rockingham include:

- Expansion of industry, which currently has potential to reach an estimated 3,000 tonnes of waste products over that which it currently produced (approximately 1,000 tonnes per year).

Indicators and Objectives

Table 25: Key indicators for 'Coastal Waters'

No	Indicator	Objective Trend or Target
5.1	Area of seagrass in Southern Flats Study Area (including Mangles bay).	No net loss in seagrass area.
5.2	Number of occasions unadvisable to swim/ Thermotolerant Coliform and confirmed Enterococci bacteria.	Zero days beaches are closed because of contamination by Thermotolerant Coliform and confirmed Enterococci bacteria.

Indicators for Coastal Waters

Indicator 5.1- Area of seagrass in Southern Flats study area

Indicator Description

The loss of sea grass in Cockburn Sound has been well-documented and is an example of severe decline in seagrass-dominated habitat. The ecological condition of Cockburn Sound was considered to have been at its lowest in the 1970s, with poor water quality, high chlorophyll a levels and the loss of extensive areas of sea grass from the eastern margin of Cockburn Sound⁴⁷. The coverage of sea grasses has declined from 2930 ha (80% coverage) in 1967 to 660 ha (18% coverage) in 1999⁴⁸. Decline was most significant in the Eastern Shoals (James Point to Woodman Point). It was also significant in the Southern Flats, east of the Garden Island Causeway, but that area is showing signs of a slow recovery.

It is important to recognise that substantial time and resources have been invested by the Government, industry and the community to improve the environmental quality in Cockburn Sound since the 1970s. During the mid to late 1980s and early 1990s, chlorophyll a concentrations and water clarity improved and have generally stabilised since then⁴⁹.

⁴⁶ Environmental Protection Authority, WA, 2007

⁴⁷ Environmental Protection Authority, WA, 2007

⁴⁸ DAL Science and Engineering, 2002

⁴⁹ Environmental Protection Authority, 2007

Table 26: Aerial cover of habitat types on Southern Flats (inclusive of Mangles Bay) study region

Habitat Class	Year					
	1967	1972	1981	1994	1999	2001
Area In Hectares						
Bare Sand	107.0	139.7	305.8	290.7	289.9	272.1
Vegetated	468.8	436.1	270.1	285.	286	303.7
Unmapped	724.3	724.3	724.3	724.3	724.3	724.3
Total	1300.1	1300.1	1300.1	1300.1	1300.1	1300.1
Percentage Of Mapped Area						
Bare Sand	18.6%	24.30%	53.10%	50.50%	50.30%	47.30%
Vegetated	81.4%	75.7%	46.9%	49.5%	49.7%	52.7%

(Source: D.A. Lord & Associates Pty Ltd and PPK Environmental & Infrastructure Pty Ltd 2001)

Parameters to measure seagrass health have changed in recent years based on research into sub-lethal indicators of seagrass health and the requirements of the State Environmental (Cockburn Sound) Policy 2005. As a result, recent surveys into sea grass health have included the recording of not only canopy cover, but also shoot density and shoot height⁵⁰ as shown in Table 27.

Table 27: Seagrass Health parameters of City of Rockingham Sites within Cockburn Sound

Survey Site	Parameter	Year		
		2006	2007	2008
Bird Island	Shoot Density	800 shoots/m2	600 shoots/m2	665 shoots/m2
	Mean Shoot Height	72cm	68cm	71cm
	Canopy Cover	40%	55%	35%
Garden Island 7M	Shoot Density	700 shoots/m2	500 shoots/m2	524 shoots/m2
	Mean Shoot Height	60cm	47cm	53cm
	Canopy Cover	40%	50%	25%
Garden Island Settlement	Shoot Density	870 shoots/m2	900 shoots/m2	832 shoot/m2
	Mean Shoot Height	45cm	43cm	44.2cm
	Canopy Cover	55%	60%	41%
Luscombe Bay (off Garden Island)	Shoot Density	1100 shoots/m2	750 shoots/m2	759 shoots/m2
	Mean Shoot Height	50cm	45cm	46.7cm
	Canopy Cover	50%	52%	42%
Mangles Bay	Shoot Density	552 shoots/m2	382 shoots/m2	317 shoots/m2
	Mean Shoot Height	56cm	46cm	44.2cm
	Canopy Cover	30%	40%	16.5%
Mercy Point	Shoot Density	800 shoots/m2	550 shoots/m2	694 shoots/m2
	Mean Shoot Height	75cm	65cm	62.8cm
	Canopy Cover	47%	50%	40.4%

(Source: Cockburn Sound Management Council, 2008)

Indicator Trend

The objective is to ensure that “there is no net loss in seagrass”. The information provided in Tables 26 and 27 indicate that the shoot density and canopy cover of seagrass can fluctuate and that across all the monitoring sites there is no clear trend.

Effectiveness of Indicator

The indicator is effective.

⁵⁰ Cockburn Sound Management Council, 2008

Proposed Indicator Changes

Nil.

Indicator 5.2 - Number of occasions unadvisable to swim due to Thermotolerant Coliform and confirmed Enterococci Bacteria.**Indicator Description**

The Health Department of WA and the City of Rockingham undertake water sampling to monitor faecal contamination at beaches in Rockingham. Management actions have been initiated by the State and local governments to identify the sources of contamination and upgrade stormwater outfall drains to affected beaches. Faecal bacteria have been detected in water (but not in seafood flesh) at three sites around Rockingham in the past.

The level of bacteria contamination of coastal waters is used as an indicator for the health of the marine environment. This can be expressed as the number of days that beaches are closed in Rockingham due to contamination, as shown in Table 28.

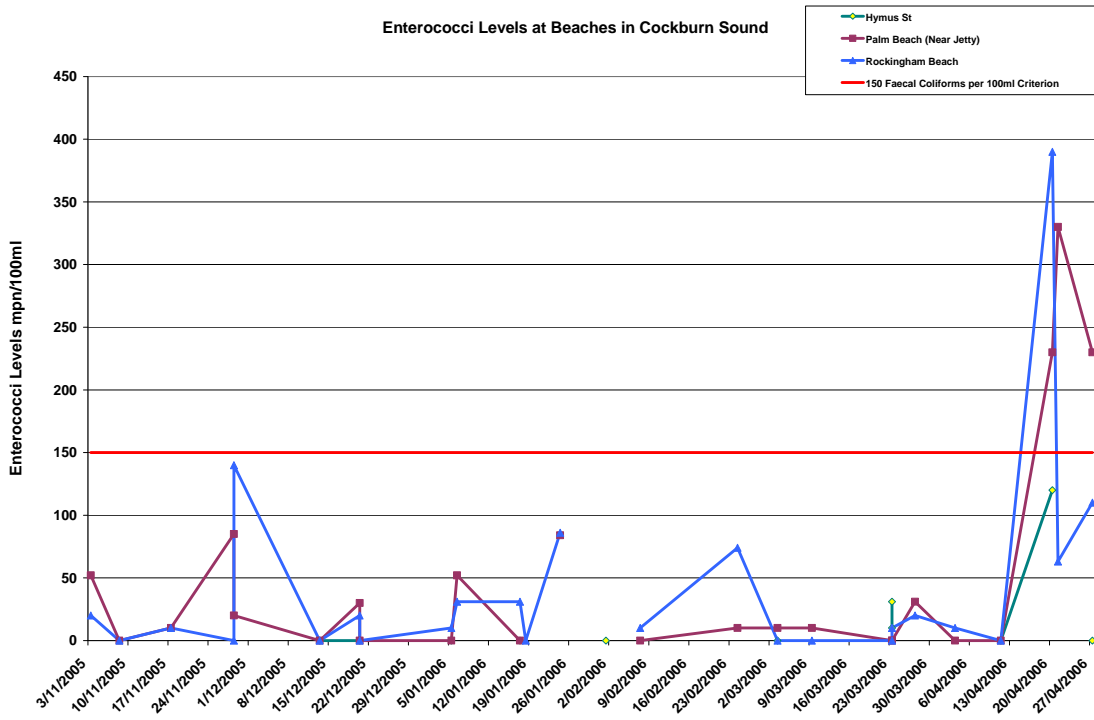
Table 28: Number of days unable to swim in due to microbiological contamination

Year	Number of days unable to swim in due to microbiological contamination.
1999	0
2000	0
2001	0
2002	0
2003	0
2004	0
2005	0
2006	0
2007	0
2008	0

(Source: City of Rockingham - Health Services).

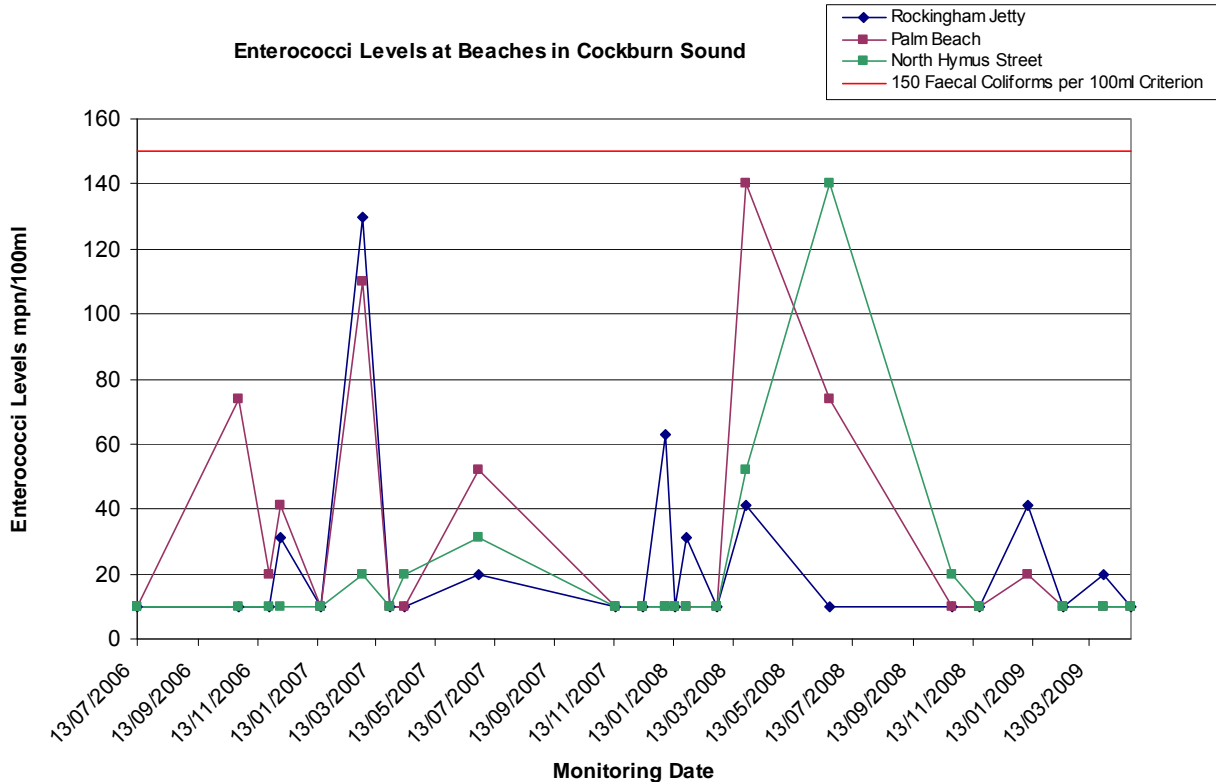
The actual levels of enterococci (mpn/100ml) recorded at Palm Beach, Rockingham Beach and Hymus Street in 2005/2006 are shown in Figure 10 and 2006/2009 are shown in Figure 11, with the 150 Faecal Coliforms per 100ml criterion mark shown in red. This criterion, if exceeded over a period of days (as determined by the Department of Health), is used to determine whether to close beaches that may pose a health risk.

Figure 11: 2005/2006 Enterococci Bacteria monitoring at beaches in Cockburn Sound



(Source: Health Department WA, 2006)

Figure 12: 2006-2009 Enterococci Bacteria monitoring at beaches in Cockburn Sound



(Source: City of Rockingham Health Services 2009)

The results in the 2006/2009 period indicate that, enterococci bacteria did not exceed the 150 faecal coliforms per 100ml criterion.

Indicator Trend

The objective is “No beach closures associated with contamination by Thermotolerant coliform and confirmed enterococci bacteria are to be recorded”. This objective is being met as no beaches were closed.

Effectiveness of Indicator

The indicator is effective.

Proposed Indicator Changes

Nil.

Progress and Council Actions

The City is currently progressing with the following actions with relation to Coastal Waters:

- Two additional sites have been identified by the City of Rockingham and the Department of Health to be included in the ocean water sampling program. These sites are located at Secret Harbour Surf Club and Waikiki Beach;
- Stormwater drainage outflows into Mangles Bay have been diverted into ground water infiltration systems; and
- Feasibility study to assess what system can be used in Warnbro Sound for storm water diversion.

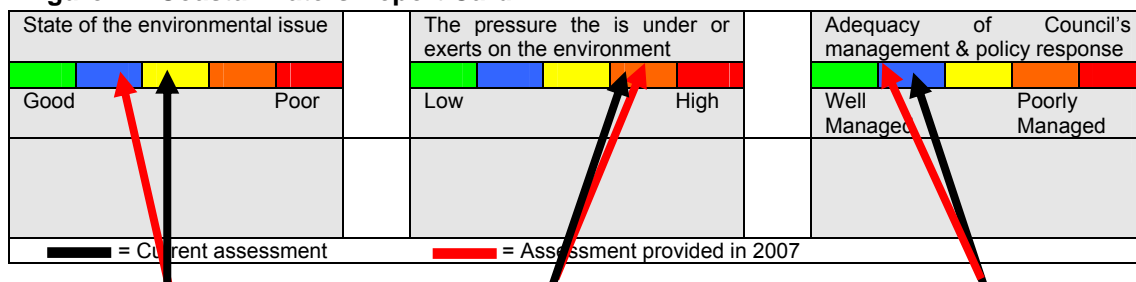
Assessment – Report Card

Table 29: Indicator Progress

No.	Indicator	Objective, Trend or Target	Progress
4.1	Area of seagrass in Southern Flats Study Area (including Mangles bay).	No net loss in seagrass area.	There is no clear trend for this indicator across the monitoring sites at present.
4.2	Number of occasions unadvisable to swim/ Thermotolerant Coliform and confirmed Enterococci bacteria.	Zero days beaches are closed because of contamination by Thermotolerant Coliform and confirmed Enterococci bacteria.	There have been no beach closures due to contamination by Thermotolerant Coliform and confirmed Enterococci bacteria.

Assessment

Figure 12: Coastal Waters Report Card



Community Comments

Community members would like to see more action on addressing this issue. There is concern regarding development of a marina and canal development at Point Peron and a boat ramp at Port Kennedy.

In particular, community members are concerned about the effect these developments will have on sea grass and the fauna which depend on it, the impacts of boat traffic on fish and fisheries.

There is also concern with regard to liquid and solid waste disposed in the ocean and the effect of this on marine life, and consequently, tourism.

Some of the indicators for this Issue were deemed inadequate as no clear trends or negative trends were defined.

Conclusion

The 'State' of the issue has deteriorated and the 'Pressure' remains high. The perceived 'Adequacy' of Council's response has remained constant and is considered to be more than adequately managed, even though the comments received from the community showed a high concern for the impact that development may have on the ecosystem.

Environmental Action Plan

Table 30: Coastal Waters Environmental Action Plan

Action	Aim	Responsibility	Priority	Progress 2007	Progress to 2009	Further Action
Seagrass in Mangles Bay						
Ensure Seagrass Protection Plan is developed & implemented in conjunction with development of any marina in the Mangles Bay area. As such, Council officers will meet with officers of the CSMC to discuss a collaborative project to map seagrass cover in Cockburn Sound.	To protect seagrass.	City of Rockingham - Strategic Planning and Environment.	High	Not yet commenced.	To date there has been no collaboration between the City and the Cockburn Sound Management Council.	Progress communication with the Cockburn Sound Management Council.
Develop during 2006/07 and subsequently implement a programme to improve, & where possible, remove stormwater drains that discharge into Cockburn Sound & other marine areas.	To reduce pollutants reaching coastal waters through the stormwater drainage system.	City of Rockingham - Engineering & Parks; Strategic Planning and Environment.	High	Plans to undertake modifications to the drainage into the Rockingham Beach area commencing in 2007/2008.	Has been progressed; Bell Park, Churchill Park, Palm Beach and Esplanade completed; Feasibility study currently being undertaken for Stage 3 Warnbro Sound, looking at infiltration basins or underground storage.	Proposed drainages works to commence in 2011; Kwinana outfall will be looked at following completion of Stage 3.
Provide input into Cockburn Sound Environmental Management Plan through representation on Cockburn Sound Management Council.	To improve the water quality in Cockburn Sound.	City of Rockingham - Strategic Planning and Environment.	High	Ongoing.	A councillor sits as representative on the Cockburn Sound Management Council and reports back on issues of interest and relevance to the City.	Nil.
Beach Closures						
Monitor water quality along Rockingham coast.	Ensure Ongoing information is provided about water quality along the coastline.	City of Rockingham - Health Services.	Ongoing	The City works in conjunction with the Department of Health to monitor beaches. All results are posted on the Department of Health website: www.healthyswimming.wa.gov.au	Monitoring undertaken by CoR Health Department and reported to WA department of Health. Monitoring occurs throughout the swimming period, from November to April. A total of 20 samples are taken during these months.	Monitoring to continue.

Action	Aim	Responsibility	Priority	Progress 2007	Progress to 2009	Further Action
Foreshore Management Plans						
Review existing and instigate new Foreshore Management Plans.	Ensure efficient use of fertiliser & reticulation on foreshore reserves to reduce potential for export of nutrient to coastal waters.	City of Rockingham - Engineering & Parks; Strategic Planning and Environment.	Ongoing	Review existing and instigate new Foreshore Management Plans (FMPs) (on a case by case basis).	Review of FMPs is being undertaken when required. Also there are regular meetings with Cockburn Sound Management Council, DEC and the Department of Transport.	Nil.

Issue 5 - Waste

Description of Issue

Waste is a by-product generated by, and discarded close to, human settlements. It may present threats to the environment and public health and amenity, but this depends on the type of waste and the way it is managed. Wastes are classified in many different ways including by the activity that generates them (i.e. waste stream) or by their nature (e.g. inert, hazardous or liquid)⁵¹.

Increased consumption results in greater waste both directly from disposal and indirectly from production processes. Municipal waste generation in Perth has been fairly steady since 2001, at just over half a tonne per capita. There is a decreasing trend in the quantity of waste going to landfill per capita, which is mirrored by a slight increase in the level of recycling in Perth⁵².

The City provides a two, 240L bin, collection system for household waste, with a yellow-topped bins provided solely for the collection of co-mingled recyclable waste material, with remaining household waste collected in green-topped bins.

There is also provision of three green waste collections and four green waste tip passes per year for residents. The green waste is shredded at the Millar Road Landfill, mulched and provided to residents and industry free of charge.

Larger items such as white goods are recycled, where possible, during the yearly bulk collections organised by the City. A recycling yard is operated at the Millar Road Landfill to recover material from the landfill. Customers can dispose of recyclable material at the recycling yard free of charge.

Threats

The key threats for Waste in Rockingham include:

- Growing population; and
- Increased levels of consumption of products leading to increased waste.

Indicators and Objectives

Table 31: Key indicators for 'Waste'

No	Indicators	Objective, Trend or Target
5.1	Waste recycled from verge side collection	Increased amount collected per capita
5.2	Volume of Green waste.	Increased tonnage recycled in line with population increase
5.3	Volume of waste to landfill.	Reduce per capita tonnage and eventually total tonnage

⁵¹ Environmental Protection Authority, WA, 2007

⁵² Environmental Protection Authority, WA, 2007

Indicators for Waste

5.1- Waste recycled from verge side collection

Indicator Description

The City contributes to the Southern Metropolitan Regional Council (SMRC) and Regional Resource Recovery Centre (RRRC). This facility provides a state of the art materials recovery system and equipment to recover recyclables from the yellow-topped bin. All plastics, glass, paper, cardboard, aluminium and steel products are separated and baled.

The City maintains comprehensive records of the amount of material that is transported to the RRRC. Table 32 highlights this information from 1999-2008.

Table 32: Total kerb-side waste collected for recycling (tonnes)

	Total amount of recyclable waste (tonnes)	Population	Kg/capita/annum
1999	2440	70 000	34.86
2000	2584	73 500	35.16
2001	3306	77 000	42.94
2002	6724	72 600	92.62
2003	7731	78 200	98.86
2004	8202	84 600	96.95
2005	8664	88 900	97.46
2006	9085	89 269	101.77
2007/08	9289	91 932	101.04
2008/09	8795	95 287	92.30

(Source: City of Rockingham 2008, ABS 2008, Planet Footprint, 2009)

Indicator Trend

The objective is to “Increase the amount of recyclable waste collected per capita”. The information in Table 32 indicates up until recently the objective has been met, with the amount per capita decreasing in 2008/2009.

Effectiveness of Indicator

The indicator is effective.

Proposed Indicator Changes

Nil.

Indicator 5.2 –Volume of green waste

Indicator Description

The City provides three green waste verge collections and four green waste tip passes per year for residents. The volumes of green waste collected are shown in Table 33.

Table 33: Total green waste collected per capita

Year	Weight of Green Waste (tonnes)	Population	Tonnes Green Waste per Capita	Kg Green Waste per Capita
1999	3,843	70,000	0.05	54.90
2000	3,764	73,500	0.05	51.21
2001	3,691	77,000	0.05	47.94
2002	5,719	72,600	0.08	78.77
2003	6,029	78,200	0.08	77.10
2004	5,906	84,600	0.07	69.81
2005	3,092	88,900	0.03	34.78
2006	2,900	89,269	0.03	32.49
2007	1,612	91,932	0.02	17.54
2008	2,187	95,287	0.02	22.96

(Source: City of Rockingham 2008)

Indicator Trend

The objective is to “Increase tonnage of green waste recycled in line with population increase”. The information in Table 33 indicates that the amount of green waste collected per capita is not presenting a clear pattern or trend over time. Also current urban development strategies (e.g. higher residential densities) may impact upon future indicator trends; changes such as the increase of smaller gardens and more paved areas may give rise to a reduction in the volume of green waste to landfill.

Effectiveness of Indicator

The Indicator is effective.

Proposed Indicator Changes

Nil

Indicator 5.3 – Volume of waste to landfill**Indicator description**

The City keeps comprehensive records of waste volumes processed at the Millar Road site and this data provides a useful indicator. Table 34 shows this data in the period from 1999 - 2006.

Table 34: Waste to Landfill – Household and Other Wastes Generated Per Annum

Year	Household Waste Collections			Other Waste (Minus Green waste) Direct to Landfill	
	Population	Tonnes	Tonnes per capita	Tonnes	Tonnes per capita
1999	70,000	27,129	0.388	55,387	0.791
2000	73,500	28,506	0.388	51,229	0.697
2001	77,000	27,401	0.356	50,451	0.655
2002	72,600	26,293	0.362	53,511	0.737
2003	78,200	27,346	0.350	61,707	0.789
2004	84,600	25,817	0.305	52,341	0.619
2005	88,900	27,578	0.310	8,943	0.101
2006	86,269	28,796	0.333	10,516	0.122
2007/2008	91,932	29,464	0.32	Data not available	
2008/2009	95,287	28,738	0.30	Data not available	

(Source: City of Rockingham, Millar Road Landfill Facility)

NB: Other Waste includes commercial waste as well as Class 3 contaminated waste.

Indicator trend

The objective is to “decrease the per capita volume of waste to landfill”. The total volume of waste is decreasing.

Effectiveness of Indicator

The Indicator is effective.

Proposed Indicator Changes

Nil.

Progress and Council Actions

The City is currently progressing with the following actions with relation to Waste:

- Reviewing the Waste Minimisation Policy in line with the carbon Pollution Reduction Scheme;
- Investigating the feasibility of a composting plant;
- Investigating the possibility of selling compost; and
- Investigating new technologies for composting, such as tunnel composting instead of windrow.

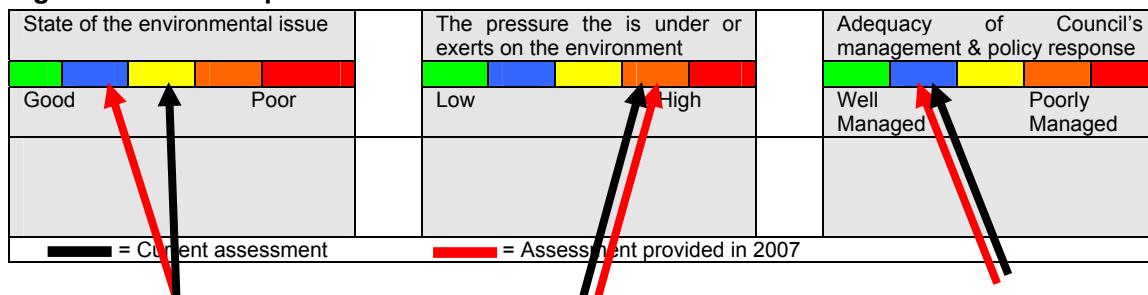
Assessment – Report Card

Table 35: Indicator progress

No.	Indicator	Objective, Trend or Target.	Progress
5.1	Waste recycled from verge side collection	Increased amount collected per capita	The amount of waste collected has increased over time.
5.2	Volume of Green waste.	Increased tonnage recycled inline with population increase	There is no clear trend for the amount of green waste recycled.
5.3	Volume of waste to landfill.	Reduce per capita tonnage and eventually total tonnage	Volume of waste is decreasing.

Assessment

Figure 13: Waste Report Card



Community Comments

Community members are supportive of the City's actions to date to address waste, but are concerned about impacts on climate change from waste and believe that more action is required.

They would like to see further increases in recycling volumes, reductions in illegal dumping and increased public education.

Some of the indicators for this Issue were deemed inadequate as no clear trends or negative trends were defined.

Conclusion

The 'State' of the issue has deteriorated and the 'Pressure' remains high. The perceived 'Adequacy' of Councils response has remained constant and is considered to be more than adequately managed.

Environmental Action Plan

Table 36: Waste Environmental Action Plan

Action	Aim	Responsibility	Priority	Progress 2007	Progress 2009	Further Action
Waste Produced						
Implement the waste minimisation policy adopted by Council in line with Southern Metropolitan Regional Council Agreement.	To increase recycling of waste and reduce waste to landfill.	City of Rockingham - Waste Services.	Medium	Ongoing.	Ongoing.	Policy to be reviewed in line with Carbon Pollution Reduction Scheme in 2009/2010.
Promoted household waste reduction programmes in the City of Rockingham.	Reduce household waste production.	City of Rockingham - Engineering & Parks.	Medium	Continued commitment with RRRC and SMRC. Development of waste education at Millar Road in progress in 2007/2008.	Ongoing.	Still ongoing; waste reduction, recycling and reuse information included in yearly waste calendar distributed to households. Waste education programme at Millar Road facility ongoing.
Recycling						
Implement a comprehensive green waste collection service.		City of Rockingham - Waste Services.	Medium	Ongoing through SMRC contractor.	Ongoing through CoR contractor	Ongoing through CoR contractor.
Reuse green waste from City Parks and waste collection service.	To recycle green waste and provide resources for Parks Department & community.	City of Rockingham - Waste Services.	Medium	Ongoing	Continually ongoing.	Looking at feasibility of a composting plant; Investigating the possibility of selling compost rather than giving it away; bulk greenwaste sometimes used as brushing on dunes as part of rehabilitation.
Develop a sustainable green waste reuse strategy on a regional basis.	To ensure efficient reuse of green waste.	City of Rockingham - Engineering & Parks.	High	Green waste mulching service Ongoing.	Green waste mulching service Ongoing.	Investigating making the much a saleable product through new technologies (tunnel composting instead of windrow)
Review option for 3rd bin for organics or weekly recycling collections		City of Rockingham - Waste Services.		NA	NA	New Action - Pending the final report. Council will decide on viability, where the organic waste stream will go and how the product will be used.

Issue 6 - Energy

Description of Issue

Each year Australians emit 550 million tonnes of greenhouse gas, mainly carbon dioxide, methane and nitrous oxide, through everyday activities such as transport, household energy use and the decay of household waste in landfill⁵³.

This level of greenhouse gas emissions have caused a shift in the natural atmospheric equilibrium and exacerbated the natural global warming process by trapping more heat in the atmosphere and changing climatic processes. This change has resulted in higher average air temperatures, changed rainfall patterns and rising sea levels⁵⁴.

In 1998, the Council joined a worldwide initiative to reduce Greenhouse Gas emissions involving local governments called Cities for Climate Protection (CCP), a campaign coordinated by the International Council for Local Environmental Initiatives (ICLEI). Over 600 local governments worldwide are participating in CCP and in Australia, there are 206 Council's, 34 from Western Australia⁵⁵. The programme had two main components; reducing corporate emissions (i.e. the City's own operational emissions) and working with the community to reduce community emissions.

As this programme is no longer running the City is still reporting on emissions. Data is collated through a company called Planet Footprint, and is used by the City to monitor emission outputs, report on, and develop mitigation strategies for the City, in much the same manner as was carried out through the CCP programme.

Threats

The key threats for Energy in Rockingham include:

- A growing population, contributing to increased energy use and GHG emissions;
- Cost in providing low/nil emission Council buildings and facilities;
- Cost in retrofitting existing buildings and facilities; and
- Public perception of the issue and involving the community in undertaking actions.

Indicators and Objectives

Table 36: Key indicators for Energy

No	Indicator	Objective, Trend or Target
6.1	Greenhouse Gas emissions.	Progress towards CCP emission reduction goal.
6.2	Electricity consumption.	Stabilise or reduce electricity use.
6.3	Public transport patronage.	Increase use.

Indicators for Energy

Indicator 6.1 – Greenhouse Gas Emissions

Indicator Description

The City of Rockingham made a commitment, as part of its Cities for Climate Protection initiatives, to reduce corporate GHG emissions by 20%, and community emissions from 1996

⁵³ Australian Government, 2006

⁵⁴ Western Australian Greenhouse Task Force, 2004

⁵⁵ ICLEI, 2005

emission levels, by the year 2010. This programme has now ceased, however the City is still committed to reducing GHG emissions through a number of initiatives.

The City's progress towards meeting the target set in 2001 is highlighted in Table 37.

Table 37: GHG emission reductions for the City of Rockingham 1998 – 2008

Sector	1998	2002	2005/06	2006/07	2007/08	2010 Targets
Corporate	8,975t	9,649.5t	12,350t	11,683t	11,697t	7,180t
Community	484,162t	N/A	N/A	N/A	977,000t	411,537t

(Source: Planet Footprint 2008)

Indicator Trend

The objective is to "Progress towards the 2010 CCP emission reduction goal". The City is not progressing towards meeting this target. Since the 2007 interim report, the City's corporate GHG emissions have stabilised, however, they are still higher than the 2010 target.

Effectiveness of Indicator

The indicator is not effective. The City's emissions would be better represented if indexed against the population of the City. As the targets are 2010 targets this indicator will need to be looked at as part of the Interim Report and modified accordingly.

Proposed Indicator Changes

Modifications to be made to this indicator to show new targets post 2010, and to be represented as a per capita figure.

Indicator 6.2 – Electricity Consumption

Indicator Description

As the main source of fuel for power generation by Synergy is fossil fuels, a major contributor of CO₂ emissions, a reduction in the City's electricity use will decrease the amount of CO₂ emissions produced.

Monitoring of the City's electricity consumption provides information on the trends and if the objective of stabilising or reducing the City's energy consumption is being met. Table 38 represents the City's electricity use and CO₂ emissions in the administrative buildings.

Table 38: Energy consumption for the City of Rockingham Administrative Building

Year	Cost (\$)	KWh	Energy Consumption (GJ)	Tonnes Equiv. CO ₂	Kg Equiv. CO ₂ per 1000 capita
2000/01	79,718	605,989	2,182	608	8.7
2001/02	81,468	617,019	2,221	619	8.4
2002/03	78,490	609,342	2,194	611	7.9
2003/04	75,148	571,068	2,056	573	7.9
2004/05	80,473	646,368	2,327	719	9.2
2005/06	84,832	704,716	2,537	784	9.2
2006/07	85,615	723,888	2,606	805	9.4
2007/08	143,574	888,014	3,197	977	9.7

(Source: SMEC 2009 & Planet Footprint 2008)

Indicator Trend

The objective is to "Stabilise or reduce electricity consumption". The objective is not being met as there has been a steady increase in electricity consumption (Table 38).

Effectiveness of Indicator

The indicator is effective.

Proposed Indicator Changes

Nil.

Indicator 6.3 - Public Transport Patronage**Indicator Description**

Western Australia is one of the most car dependent regions in the world, with 81% of all trips undertaken by car⁵⁶. Increasing public transport use over private vehicle use would decrease community greenhouse gas emissions and can be used as an indicator to monitor community greenhouse gas contributions as highlighted in Table 39.

Table 39: Public transport patronage within the City of Rockingham

	2001	2002	2003	2006	2007	2008
Total Boardings	2,614,745	2,780,559	2,766,562	1,031,908	2,772,076	4,463,133
Population	77,000	72,600	78,200	87,5 00	91,932	95, 287
Boardings per capita	33.96	38.30	35.38	11.79	30.15	46.84

* NB Bus boardings were used as the sole form of public transport patronage from 2001 - 2006
(Source: Travel Smart 2008)

Indicator Trend

The objective is “increased use” of public transport per capita. The data in Table 39 indicates that transport patronage has increased which is consistent with the objective, which is presumably due to the construction of the Mandurah Rail line. This rail service has two stations within the City; Rockingham and Warnbro.

Effectiveness of Indicator

The indicator is effective.

Proposed Indicator Changes

Nil.

Progress and Council Actions

The City is currently progressing with the following actions with relation to Energy:

- Continuing with principles of CCP Programme by reporting on GHG emissions and developing mitigation strategies for the City;
- Support of Climatewise, including the provision of Home energy Assessment Toolkits and the Living Smart program.
- Continued TravelSmart initiatives including:
 - Walking School Bus Programme at Singleton Primary School; and
 - Encourage the use of bicycles through development of bike paths and the continued implementation of the 2007 Bikeplan.
- Continued use of renewable and emission offset energy sources is occurring, including:
 - Naragebup Rockingham Regional Environment Centre: wind turbines and photovoltaic solar panels;
 - Murdoch University (Rockingham Campus): tracking solar panels and a proposed wind turbine;
 - Warnbro Community High School: photovoltaic solar panels;

⁵⁶ CCP, 2008

- Warnbro Y Recreation Centre: photovoltaic solar panels;
- Safety Bay Library: solar air heater; and
- Warnbro Y, Safety Bay Library and the City's Administration Building: use of Natural Power from Synergy.

Methane gas extraction at Millar Road Landfill site is continuing and enabling the City to reduce its greenhouse gas emissions by approximately 5,875 tonnes per year.

To assist Council in the implementation of existing renewable energy technology initiatives, and to provide new ideas for greenhouse gas reduction, the City has supported a student workplace intern programme employing undergraduate renewable energy engineering students from Rockingham's Murdoch University Campus. This is a unique and beneficial partnership between Council and Murdoch University.

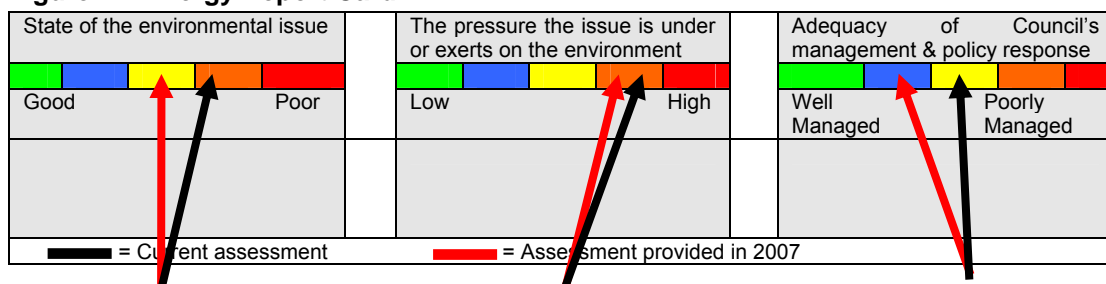
Assessment – Report Card

Table 40: Indicator Progress

No	Indicator	Objective, Trend or Target	Progress
6.1	Greenhouse Gas emissions.	Progress towards CCP emission reduction goal.	CO2 emissions are increasing and not progressing towards target.
6.2	Electricity consumption.	Stabilise or reduce electricity use.	Still increasing, although measures have reduced CO2 impact.
6.3	Public transport patronage.	Increase use.	Data not sufficient to identify trend.

Assessment

Figure 14: Energy Report Card



Community Comments

Community members are concerned about climate change and would like to see more action in this area. Residents would like to see more support from the City for employees and residents to improve energy efficiency, increase the use of renewable energy and improve public transport accessibility and patronage.

Conclusion

The 'Pressure' on the issue remains high and the 'State' of the issue has declined along with the perceived 'Adequacy' of the Council's response to the issue. The continual population growth within the area places a pressure on energy use and in turn GHG emissions. Becoming more efficient and looking more closely at offsetting the GHG emissions are important steps to take in regard to this issue.

Environmental Action Plan

Table 41: Energy Environmental Action Plan

Action	Aim	Responsibility	Priority	Progress 2007	Progress 2009	Further Action
Greenhouse Gas Emissions – Electricity						
Prepare an inventory of Greenhouse Gas emissions from Corporate and Community sources.	To provide baseline data against which to measure reductions.	City of Rockingham - Strategic Planning and Environment.	Ongoing	Corporate Inventory completed. Next proposed inventory scheduled for 2007.	Inventory completed in 2007; Actions being undertaken and a report being compiled. Measures Report completed in 2007.	Re-inventory to be completed in 2010 using Planet Footprint Reports and CCP data. Measures Report will also be completed in 2010.
Engage specialist consultants to conduct energy use audits of major Council buildings.	To identify actions which can be implemented to reduce corporate energy use.	City of Rockingham - Strategic Planning and Environment; Engineering & Parks.	High	Greenhouse Gas Emission Audit completed for the Safety Bay Library, Warnbro Recreation Centre, Aqua Jetty, Mike Barnett Sport Complex and Council Depot.	Aqua Jetty investigated use of solar Hot Water System, and the use of geothermal energy; Administration Building audited in 2008 and actions are currently being implemented.	Recommendations from the Administration Building audit are to be implemented. Next building to be audited will be selected in early 2010 in consultation with Asset Maintenance.
Develop and implement a Community Greenhouse Reduction Programme.	To reduce the Greenhouse Gas emissions in the City of Rockingham.	City of Rockingham - Strategic Planning and Environment.	High	Reviewed Regional Greenhouse Strategic Community Plan (South West Corp) The SMRC has employed a Regional Greenhouse Gas Education Officer.	SMRC Programme rebranded to 'Climate Wise'. CoR supports & promotes this programme. Dry Cell Battery recycling bins have been placed in key administration buildings around the City in conjunction with the SMRC.	Continue to work with SMRC on Climatewise programme; Develop possible product discount proposal for community rebates on sustainable energy technology.
Progress City's participation in CCP programme and implement the Local Action Plan (LAP) for the corporate sector.	To reduce the Greenhouse Gas emissions in the City of Rockingham.	City of Rockingham - Strategic Planning and Environment.	Ongoing	Completed Milestone 5, and the City is now at CCP plus.	CCP no longer running; CoR is looking at alternative ways to undertake actions.	The City is exploring the value of participating in the CCP Partners Programme.
Progress City's participation in CCP Programme and set a Greenhouse Gas reduction goal for the community.	To reduce the Greenhouse Gas emissions in the City of Rockingham.	City of Rockingham - Strategic Planning and Environment; Engineering & Parks.	Medium	Ongoing. Regional Community Action Plan to reduce Community GHG has been reviewed & the SMRC has employed a Regional Greenhouse Gas Education Officer.	CCP no longer running; CoR is looking at alternative ways to undertake actions.	The City is exploring the value of participating in the CCP Partners Programme. Investigating goal setting with relation to GHG emissions within the community.
Implement methane extraction at Millar Road Landfill site.		City of Rockingham - Engineering & Parks.	Ongoing	Landfill gas extraction is on going with energy produced contributing to the Rockingham power grid.	Is undertaken; reported on yearly.	Continue with methane extraction and yearly reporting.

Action	Aim	Responsibility	Priority	Progress 2007	Progress 2009	Further Action
Greenhouse Gas Emissions – Public Transport Patronage						
Promote public transport use to, from and within the City.	To reduce the number of short, single occupant, car journeys to reduce Greenhouse Gas emissions.	City of Rockingham - Planning & Development Services.	Medium	Currently developing the Rockingham City Centre Transit Strategy (bus services) to be implemented 2006 in conjunction with the Railway completion. Funding received for an Integrated Transport Plan to be commenced 2005/06.	Rockingham City Centre Transit Strategy has been implemented and the Shuttle bus operational around the City; Town Planning Scheme – Car Parking (Bicycle end of trip facilities) is complete.	Continue to implement the Rockingham Bike Plan and carry out minor infrastructure works; Review Station Access and implement minor works as necessary; Ensure developers adhere to Town Planning Scheme – Car Parking (Bicycle end of trip facilities) – Policy; Pedestrian Access Way Strategy is under review; Lobby for increased off peak frequencies and accessible buses; Green Travel Choices info stand displayed at events.
Investigate instigating TravelSmart Programme.	To reduce Greenhouse Gas emissions.	City of Rockingham - Recreation Department; Strategic Planning and Environment; Engineering & Parks.	Medium	TravelSmart Programme commenced.	TravelSmart program was undertaken in Rockingham, Cooloongup & Hillman in 2007; report on the effectiveness of this programme has been completed.	Travelsmart programme has ceased. The City will continue to use information from report in implementing other programmes.
To produce a Vehicle Fleet Greenhouse Gas Policy.	To reduce Greenhouse Gas emissions.	City of Rockingham - Engineering & Parks.	Medium	Commenced.	Light Vehicle Fleet Policy has been adopted & all new vehicles purchased must meet a minimum 3.5 star rating based on Australian Government Green Vehicle Guide Star Rating. (Current average Green Star Rating 3.32).	To continue to improve the environmental performance of the light vehicle fleet with the objective of achieving a 4 Star Australian Government Green Vehicle Guide rating across the entire fleet.
Implement further Greenhouse Gas mitigation projects.	To reduce Greenhouse Gas emissions.	City of Rockingham - Engineering & Parks; Strategic Planning and Environment.	Medium	A number of Greenhouse Gas Mitigation Projects are on going and commencing to assist the City meets its set goals.	A number of Greenhouse Gas Mitigation Projects are on going and commencing to assist the City meets its set goals.	Investigate the feasibility of conducting a staff sustainability education programme; Development of Sustainable Purchasing Policy; Implement findings of 2008 energy Audit of Council Administration Building; Community Environmental Education programmes - Sustainability Education Programme and Solar Schools.

Action	Aim	Responsibility	Priority	Progress 2007	Progress 2009	Further Action
Greenhouse Gas Emissions – Public Transport Patronage						
Encourage the use of bicycles through development of bike paths and implementation of 'Bikeplan'.	To reduce Greenhouse Gas emissions.	City of Rockingham - Engineering Services.	Ongoing	Promote and expand the Bikeplan through the upgrading and extension of cycle paths throughout the City. Prepare promotional pamphlets for public use.	Bike Plan exists, now being implemented through minor works; upgrades to bike paths and signage, bike shelters, etc.	Continue works as part of the implementation of the BikePlan, including minor infrastructure works.
Prepare and implement an Integrated Transport Plan.	To better integrate private/public transport throughout the City.	City of Rockingham - Engineering & Parks; Planning and Development Services.	High	Funding pursued and received from DPI for preparation of a plan in 2005/06.	Plan completed in 2007. Implementation of recommendations currently taking place.	Implementation of plan still ongoing, including: PAW (Public Access Way) Strategy; Monitoring Park n' Ride demand and review of station access and community based approach to Local Area Traffic Management.

Issue 7 - Land Management

Description of Issue

Land degradation (salinity, erosion and contamination) are some of Western Australia's most prevalent environmental threats⁵⁷. Widespread clearing of land and increased use of irrigated agriculture has caused widespread salinity problems across Australia and has led to community concern. This concern relates to threats to ecological systems, biodiversity, infrastructure (roads and buildings) and agricultural productivity.

Most of Western Australia's salinity is considered dryland salinity and affects large areas of the inland areas of the southwest of the State. Dryland salinity is the result of the removal of deep rooted perennial vegetation and its replacement with shallow rooted annuals. Salinity can also be caused by irrigated agriculture where the water filters through to the groundwater and causes it to rise, bringing with it any stored salt. There is growing evidence of this type of salinity on coastal margins of the southwest, including the rural areas of Rockingham. This type of salinity is termed Secondary Surface Salinity⁵⁸.

Land contamination is defined as land that has a pollutant (or pollutants) at above-background concentrations causing, or with the potential to cause, adverse impacts to human health, the environment or any environmental value. The toxicity and persistence of pollutants in soils, as well as their direct uptake by people, plants and animals, is the major concern with land contamination. The extent and severity of contamination will depend on pollutant type, land uses and industries, soil types and the effectiveness of pollution controls⁵⁹.

Examples of land uses that have been known to lead to contamination include:

- Abattoirs;
- Automotive Repair, Engine Works and Spray Painting;
- Concrete Batching or Cement Product Manufacturing (Asbestos);
- Dry Cleaning Establishment;
- Intensive Agriculture;
- Printing Shops;
- Rifle Range; and
- Wool Scouring.

Acid sulfate soils underlie large areas of Australia's coastline where the majority of Australians live. In an undisturbed and waterlogged state these soils are relatively harmless, but when disturbed and exposed to oxygen through drainage or excavation, these soils produce sulfuric acid in large quantities. Development for tourism, towns and agriculture has disturbed large areas of acid sulfate soils. The impacts of coastal acid sulfate soil runoff come at a significant environmental, economic and social cost⁶⁰.

Threats

The key threats for Land Management in Rockingham include:

- Removal of protective vegetation cover through clearing or grazing, cultivation of crops and chemical changes to the soil (e.g. salinisation or increased water repellence);
- Exposure of land to risk of hydrological erosion
- Disturbance of acid sulfate soils; and
- Soil contamination from agriculture and industry.

⁵⁷ Environmental Protection Authority 2007

⁵⁸ Department of Agriculture, WA, 2007

⁵⁹ Environmental Protection Authority, WA, 2007

⁶⁰ Department of Environment, Water, Heritage and the Arts, 2008

Indicators and Objectives

Table 42: Key indicators for 'Land Management'

No	Indicators	Objective, Trend or Target
7.1	Area of land at risk or suffering from Secondary Surface Salinity	Monitor changes in salinity levels and potential for increase
7.2	Area at risk or suffering from hydrological related erosion	Monitor changes in erosion prone areas
7.3	Number of known contaminated sites.	Monitor change in the number of contaminated sites

Indicators for Land Management

Indicator 7.1 - Area of land at risk or suffering from secondary surface salinity

Indicator Description

Secondary surface salinity can have negative environmental and social impacts such as vegetation decline, biodiversity decline, poor soil and water quality, reduced crop yields, and damage to infrastructure⁶¹.

The Western Australian Department of Agriculture undertook a salinity survey in 2003, to assess land in local government areas at risk of secondary surface salinity. The data provided in Table 43 is from this 2003 report and is the most up to date information available at the time of collating this report.

The City of Rockingham features a moderate to high salinity risk, generally confined to the eastern margins of the municipality. This includes surface soils surrounding the inland lakes system of Lake Walyungup and Amarillo Swamp region which represent 70% of total land area at risk of extreme salinity, and are also areas identified to be at high risk for erosion. Table 43 indicates the total land area of salinity risk for Rockingham.

Table 43: Area of salinity risk for Rockingham and other local government areas

Shire	Total Area (ha)	Area of Salinity Risk (ha)
Rockingham	24,500	300
Kwinana	12,000	0
Mandurah	17,800	500
Murray	182,400	2,400
Serpentine Jarrahdale	518,000	900

(Source: WA Dept. of Agriculture 2003)

Indicator trend

The objective is to "Monitor changes in salinity levels and potential for increase". At present, the 2003 data is the most up-to-date information available from the Department of Agriculture.

Effectiveness of Indicator

The indicator is effective.

Proposed Indicator Changes

Nil.

⁶¹ Department of Agriculture, 2007

Indicator 7.2 - Area at Risk or Suffering from Hydrological-Related Erosion

Indicator Description

In 2003 the Department of Agriculture released data outlining the area of land at risk of suffering from hydrological-related erosion, giving a useful measure of good land management. Table 44 below summarises the findings pertaining to Rockingham.

Table 44: Area of erosion risk for Rockingham and other local governments

Shire	Total Area (ha)	Area of Water Erosion Risk (ha)
Rockingham	24,500	800
Kwinana	12,000	200
Mandurah	17,800	2,300
Murray	182,400	10,900
Serpentine Jarrahdale	518,000	3,000

(Source: WA Dept. of Agriculture 2003)

Areas of high erosion risk are evident along the City's coastal peripheries, in particular, the Warnbro Sound Primary Dune Complex, Secret Harbour, inland Singleton, Golden Bay region, and limestone outcrops of Shoalwater and Point Peron.

Indicator Trend

The objective is to "Monitor changes in erosion prone areas". At present, the 2003 data is the most up-to-date information available from the Department of Agriculture. The Department of Agriculture is due to undertake the next hydrological erosion survey in 2010.

Effectiveness of Indicator

The indicator is effective.

Proposed Indicator Changes

Nil.

Indicator 7.3 - Number of known Contaminated Sites

Indicator Description

Land and water contamination is defined as land or water that has a pollutant (or pollutants) at above-background concentrations causing, or with the potential to cause, adverse impacts to living beings and the environment⁶². The term 'pollutants' covers a range of chemicals such as heavy metals, pesticides, herbicides, oils, hydrocarbons and other toxic chemicals. Contaminated sites are usually identified after the polluting activity or land use has ceased and the land is being redeveloped for another use. Some contaminated sites are identified once groundwater pollutant plumes are detected in inland waters or bore water⁶³.

The Contaminated Sites Act (2003) took effect in December 2006. Under the legislation, any known or suspected contaminated land or water must be reported the Department of Environment and Conservation (DEC) and recorded on the Contaminated Sites Register.

All sites of known or suspected contamination reported to DEC are classified under the Act as one of the following categories:

1. Report not substantiated
2. Possibly contaminated – investigation required

⁶² Department of Conservation and Environment, 2007

⁶³ Environmental Protection Authority, WA, 2007

3. Not contaminated – unrestricted use
4. Contaminated – restricted use
5. Contaminated – remediation required
6. Remediated for restricted use
7. Decontaminated

Since 2007 there have been a total of seventy six contaminated sites reported to DEC for the City of Rockingham (Table 45). The majority of these sites have become contaminated through industrial effluents and discharges, commercial agriculture, the application of commercial and residential fertilisers, pesticides and herbicides, and the disturbance of acid sulphate soils (ASS) associated with mining and land development^{64,65,66}.

Table 45: Contaminated sites reported to the DEC June 2007 – April 2009

Category	2007	2008	2009	Total
Possible Contamination - Investigation required	3	2	2	
Contamination-Restricted Use		1		
Contamination-Remediation Required	1			
Remediated-Restricted Use		67		
Total Sites Reported	4	70	2	76

(Source: DEC 2009)

NB: The large number of reported sites in 2008 was due to the fact that the legislation officially came into play in 2006, with landowners having a two year grace period to comply. During 2008, DEC received approximately 1000 registrations of contaminated sites.

Indicator Trend

The objective is to “Monitor change in the number of contaminated sites”. The number of contaminated sites identified has continued to increase since 2006. The City continues to work with the DEC, businesses, and community to identify and remediate contaminated sites and work to prevent further sites to be contaminated.

Effectiveness of Indicator

The indicator is effective.

Proposed Indicator Changes

Nil.

⁶⁴ DEC 2008

⁶⁵ Environmental Protection Authority, WA, 2007

⁶⁶ National Pollution Inventory, 2008

Progress and Council Actions

The City is currently progressing with the following actions with relation to Land Management:

- Development and implementation of the Kwinana Beach Coastal Foreshore Management Plan;
- The Horse Guidelines 2005 are used to assess horse keeping on rural properties;
- Continued assessment of all applications for the potential for retention of vegetation and rehabilitation;
- Continued monitoring of contaminated sites through the planning process; and
- Investigating coastal modelling as a response to climate adaptation.

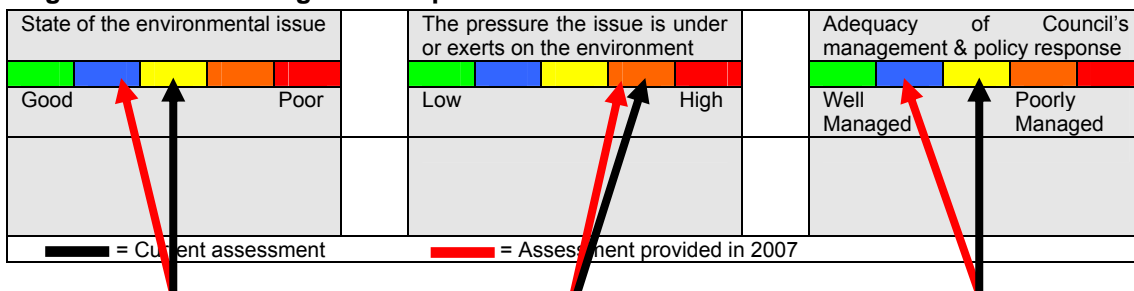
Assessment – Report Card

Table 46: Indicator Progress

No	Indicator description	Objective, Trend or Target	Progress
7.1	Area of land at risk or suffering from secondary surface salinity	Monitor changes in salinity levels and potential for increase	This is baseline data and no trend is yet discernable.
7.2	Area at risk or suffering from hydrological related erosion	Monitor changes in erosion prone areas	This is baseline data and no trend is yet discernable
7.3	Contaminated Sites within Rockingham	Monitor number of recorded sites as per DEC database	This is baseline data and no trend is yet discernable

Assessment

Figure 15: Land Management Report Card



Community Comments

Community members are concerned about acid sulphate soils, erosion and salinity and the effect these have on the soil in their areas. They identify these problems as increasing due to land clearing and are concerned about the City's response to land clearing.

Conclusion

The 'Pressure' on this issue remains high, the 'State' of the issue and the 'Adequacy' of Council's response has decreased since the Interim Report as there are actions that have not been commenced or continued in the Action Plan.

Environmental Action Plan

Table 47: Land Management Environmental Action Plan

Action	Aim	Responsibility	Priority	Progress 2006/2007	Progress to 2009	Further Action
Require Environmental Audits of suspected contaminated sites as an approval condition.	To identify contaminated sites prior to further development of land.	City of Rockingham - Development & Planning Services; Building Services.	Medium	Ongoing.	Undertaken on a case by case basis.	Continue investigation.
Ensure any resource extraction approvals include condition for rehabilitation to original state.	To prevent degradation.	City of Rockingham - Development & Planning Services; Engineering & Parks.	Medium	Rehabilitation forms part of the development as an approval condition.	Undertaken on a case by case basis.	Continue investigation.
Investigate Natural Heritage Trust funding opportunities in collaboration with the City of Cockburn and the Town of Kwinana for an educational programme or incentives programme for rural landowners to improve land management practices.	To improve land management on private landholdings.	City of Rockingham - Strategic Planning and Environment.	Medium	No action to date.	No action to date.	No action to date.

Issue 8 - Atmosphere

Description of Issue

Air pollutants continue to be of community concern⁶⁷ and poor air quality can have a range of impacts on the community, including health issues, harm to flora and fauna and damage to infrastructure. The impacts of changes in the atmosphere can be observed on different scales. The 'greenhouse effect' (now generally known as climate change) and depletion of the stratospheric ozone layer are significant global atmospheric issues. On the regional and local scale, photochemical smog, particulates (including particulate haze and dust) and sulfur dioxide are well-recognised air quality problems⁶⁸.

There are several mechanisms in place to protect human and environmental health. These include a series of national environment protection measures (NEPMs) related to ambient air quality, air toxics, data collection for the National Pollutant Inventory and diesel vehicle emissions. It is a requirement that all measures are implemented and reported on. Standards for ambient air quality may be set over various timeframes to determine persistence and associated health impacts. They may also specify a number of allowable exceedances of a standard per year.

Key regional air quality issues related to Nitrogen dioxide (NO₂), Ozone (O₃) and Sulphur dioxide (SO₂), which are commonly used as indicators of atmospheric contamination, are monitored by the DEC at a site in north-east Rockingham as a requirement under the Environmental Protection (Kwinana) (Atmospheric Wastes) Policy 1999. Strict standards are in place to ensure that emission levels stay well below the NEPMs.

Threats

Key threats to air quality in Rockingham are:

- Expanded industry at Kwinana (although the Kwinana EPP controls levels of SO₂ and dust from industry); and
- Uncontrolled sources of particulates (haze) from bush fires and wood stoves.

Indicators and Objectives

Table 48: Key indicators for 'Atmosphere'

No.	Indicator	Objective, Trend or Target
8.1	Pollutant (NO ₂ , SO ₂ and O ₃) concentration in air.	DEC criteria/government standards are not breached.
8.2	Number of dust, odour, overspray and smoke related complaints made to the City of Rockingham.	Complaints responded to within 5 working days.

Indicators for Atmosphere

Indicator 8.1 Pollutant (NO₂, SO₂, O₃) Concentration in Air

Indicator Description

Air quality monitoring, as carried out by the DEC, is a good indicator of regional air quality. Figures 16, 17 and 18 show the maximum recorded level of O₃, NO₂ & SO₂ concentration in air as measured at North-east Rockingham between 1996 and 2009.

DEC uses the National Environment Protection Measures (NEPMs) as standards for these three gases.

⁶⁷ Health Department of Western Australia, 2008

⁶⁸ Environmental Protection Agency, WA, 2007

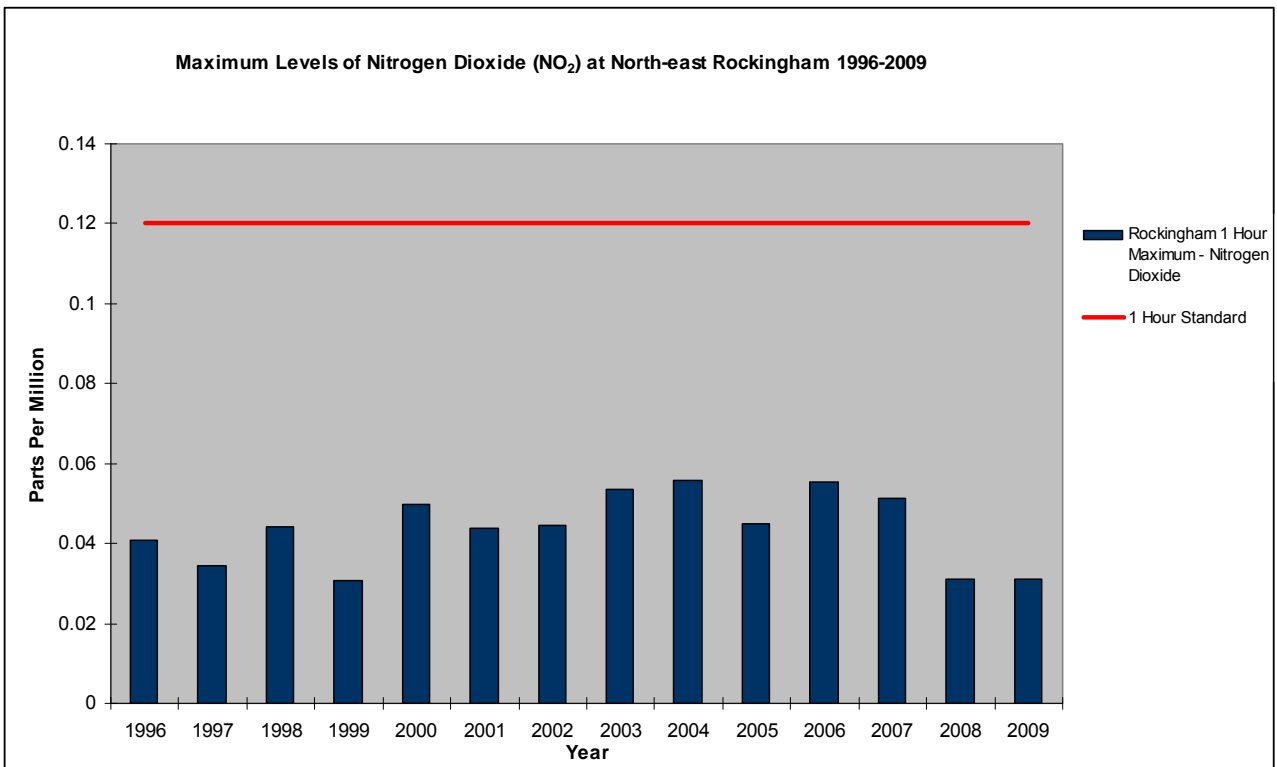
The standards involve calculations for three time periods – 1 hour, one day and one-year averages. The standards involve setting concentrations for each period and then nominating the maximum number of times these figures may be exceeded. For the purposes of this Report, the 1-hour average figures will be used with a standard for this criterion as not to be exceeded.

The 1 hour standards are as follows:

- NO₂ - 0.12 parts per million (ppm);
- SO₂ – 0.20 ppm; and
- O₃ - 0.10 ppm

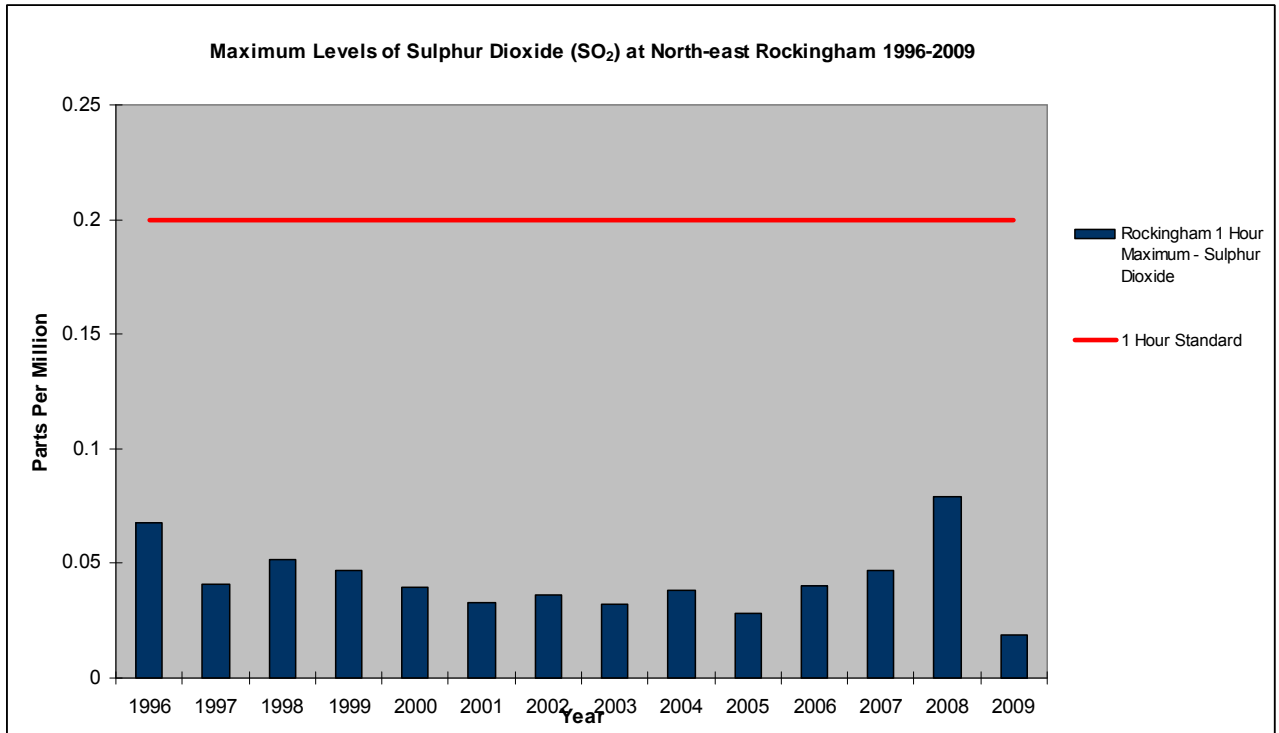
The one hour standards are indicated as a red line on the graphs in Figures 16, 17 & 18.

Figure 16: Maximum Levels of Nitrogen Dioxide (NO₂) Recorded at North-East Rockingham 1996 – 2009



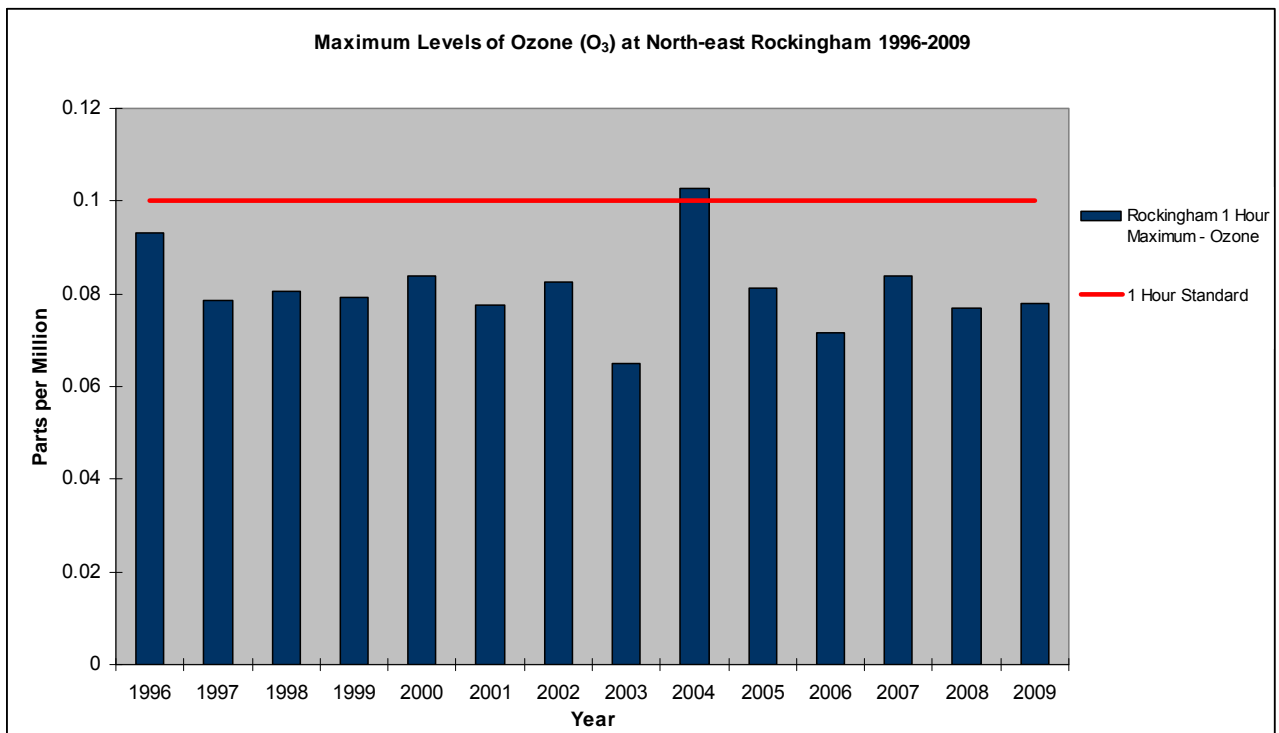
(Source: Department of Environment 2009)

Figure 17: Maximum Levels of Sulphur Dioxide (SO₂) Recorded at North-east Rockingham 1996-2009



(Source: Department of Environment 2009)

Figure 18: Maximum Levels of Ozone (O₃) Recorded at North-east Rockingham 1996- 2009



(Source: Department of Environment 2009)

Indicator Trend

The objective is to ensure “DEC criteria and government standards are not breached”. The objective has been met.

Effectiveness of Indicator

The indicator is effective.

Proposed Indicator Changes

Nil.

Indicator 8.2 - Number of dust, smoke, and odour related complaints to the City of Rockingham**Indicator Description**

Levels of smoke, dust, odour, and over spray caused by local activities are measured by the number of complaints received by the City. The number of these complaints is used as an indicator of local air quality. Table 49 highlights the number of written complaints received by the City's Health Services with regard to smoke, dust, odour and overspray in a residential, commercial and industrial setting.

Table 49: Complaints received by the City of Rockingham in regards to smoke, dust, odour and over spray in residential and commercial settings

YEAR	2001	2002	2003	2004	2005/ 2006	2006/ 2007	2007/ 2008	2008/ 2009
Source of Complaint								
Residential smoke	12	7	20	8	16	6	9	8
Residential dust			3		2	2	0	3
Residential odour	11	14	5	8	8	2	2	8
Residential over spray		2			0	1	1	0
Commercial smoke			1		0	1	0	2
Commercial dust			2	3	1	1	0	0
Commercial odour	6	5	1	14	13	5	6	4
Commercial over spray		2	1		0	0	0	0
Totals	29	30	33	33	40	18	18	25

(City of Rockingham 2008)

Indicator Trend

The objective is "Respond to complaints in 5 working days or less". Fewer complaints than previous years". The information in Table 49 indicates that there is no clear trend on the number of complaints over time.

Effectiveness of Indicator

The indicator is effective.

Proposed Indicator Changes

Merge indicator 8.3 "Number of Wood Fire Heater Smoke Complaints." with Indicator 8.2 as the City's Health Services reports wood fire smoke complaints as "smoke".

Report on the indicator in terms of number of complaints received as well as complaints responded to within 5 working days as this provides a better measure of the Council's response to community concerns.

Progress and Council Actions

The City is currently progressing with the following actions with relation to Atmosphere:

- Developed and currently implementing a City of Rockingham Burning-of Rubbish, Refuse & Vegetation policy;
- Supporting the DEC in programmes that address smoke issues related to wood fire heaters;
- Providing input into the review of the Kwinana Environmental Protection Policy; and
- Assessment of applications for industrial development considers emissions that a new industry will produce.

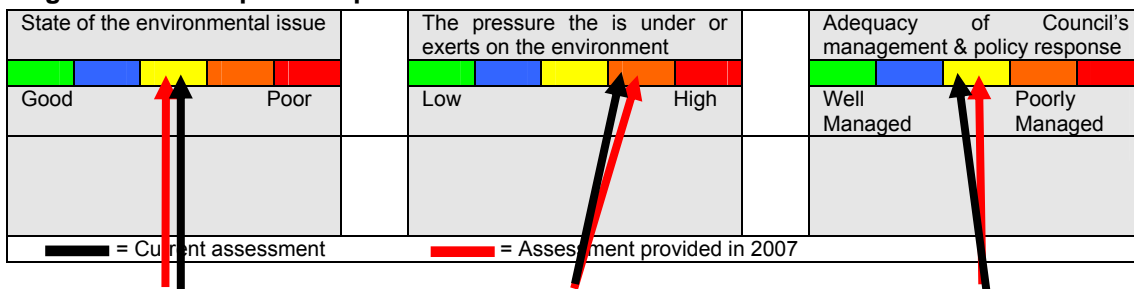
Assessment – Report Card

Table 50: Indicator Progress

No	Indicator description	Objective, Trend or Target	Progress
8.1	Pollutant (O3, NO2 & SO2) concentration in air.	DoE criteria/government standards are not breached.	This objective is being met.
8.2	Number of dust, odour, overspray and smoke related complaints to the City of Rockingham.	Fewer complaints than previous years.	It is not possible to say that the objective/trend is being met as a trend is not clear.

Assessment

Figure 19: Atmosphere Report Card



Community Comments

Community members would like to see atmospheric pollution from industry reduced and more clean industries in the industrial area. Residents were unaware of any specific atmospheric issues in their local area.

Conclusion

The 'Pressure', 'State' and the 'Adequacy' Council's response have remained similar to the 2007 assessment. As highlighted by the indicators, there are no alarming trends present, even though the pressure on this issue remains moderately high.

Environmental Action Plan

Table 51: Atmosphere Environmental Action Plan

Action	Aim	Responsibility	Priority	Progress 2007	Progress 2009	Further Action
Levels of NO₂, SO₂ & O₃						
City of Rockingham to follow up with the DoE any breaches of Ozone, Nitrogen dioxide, Sulphur dioxide concentration standards on review of quarterly air quality report.	To assist the DoE in reducing the incidence of air pollution events.	City of Rockingham - Health Services.	Ongoing	No breaches to follow up	No breaches to follow up.	Nil.
City of Rockingham to support implementation and provide input into the review of Kwinana EPP.	To protect air quality.	City of Rockingham - Strategic Planning and Environment.	Ongoing	Ongoing.	CoR provided input into the review of the Kwinana EPP and will support the outcomes of the review process.	Awaiting outcome of Kwinana EPP review.
Odour, smoke and dust						
Investigate ways of encouraging use of non-wood-burning heaters through the Building Application Approvals process.	To reduce incidence of haze and reduce and Greenhouse Gas emissions.	City of Rockingham - Building Services.	Medium	Working with DEC to encourage the replacement of wood heaters.	DEC did not coordinate the Perth Wood Heater Rebate Programme in 2009. No indication whether it will run in 2010.	CoR would be prepared to be involved at some level, if the Perth Wood Heater Rebate Programme is run.
Develop and implement a City of Rockingham Burning-of Rubbish, Refuse & Vegetation policy.	To improve air quality and reduce number of smoke/haze complaints.	City of Rockingham - Health Services.	Medium	Policy established that requires all Rockingham residents to apply for a license prior to burning off outside fire restricted times.	Policy will continue to be implemented. All complaints are attended to as a matter of priority, if possible on the day they occur, but at the maximum within 5 working days.	Continue with follow up of complaints.
Ensure issues of odours, smoke, dust and noise considered as part of all development applications affecting Rockingham.	To improve air quality and reduce the incidence of odours, smoke/haze, dust and noise complaints.	City of Rockingham - Health Services; Strategic Planning and Environment.	High	Commenced and ongoing.	Ongoing.	Ongoing.
Wood fire Heaters						
Develop and implement Public Education programme to promote the correct methods for operating wood fired heaters.	To reduce the impact of wood fire heaters and as a result improve local air quality.	City of Rockingham - Health Services.	Medium	Through various media information is provided to the public on an ongoing basis.	Targeted education to neighbourhoods where there are complaints.	Continue education.
Introduction of combined Local Government/State Government Wood Fire Replacement Programme.	To reduce the impact of wood fire heaters and as a result improve local air quality.	City of Rockingham - Health Services.	Medium	DEC runs a programme that the City supports, although no budget is allocated to support the programme in terms of a buy back scheme.	Promote and support Perth Wood Heater Rebate Program when applicable (Currently not running in 2009).	Continue support when required.

Issue 9 - Heritage

Description of Issue

Heritage is present in many forms including places, objects, languages and other intangible forms. In this report, only heritage places (or sites) are considered as part of the environment⁶⁹. Other forms of heritage (heritage objects in museums, intangible heritage and languages) are beyond the scope of this report.

Places designated as having heritage value, both Aboriginal and European, hold particular significance for aesthetic, historic, scientific or social reasons⁷⁰. The Heritage Act (1990) and the Aboriginal Heritage Act (1972) provide legal protection for sites and or buildings considered to be of heritage value across the State. Within the City, places of heritage value include; landscapes, landmarks, structures, and buildings, which have heritage significance for current and future generations.

Figure 20: Old Abattoir Building, Dixon Road



Threats

The key threats to heritage in Rockingham include:

- Sites not being identified for protection; and
- Development not retaining heritage value of sites.

Indicators and Objectives

Table 52: Key indicators of 'Heritage'

No.	Indicator	Objective Trend or Target
9.1	Number of significant Aboriginal Sites protected.	Retain No. of protected sites.
9.2	Number of non-Aboriginal Heritage sites protected.	Increase No. of protected sites.

⁶⁹ Environmental Protection authority, WA, 2007

⁷⁰ Environmental Protection authority, WA, 2007

Indicators for Heritage

Indicator 9.1 - Number of significant Aboriginal sites protected

Indicator Description

The Aboriginal Heritage Act (1972) provides legal protection for sites and structures considered to be of heritage value across Western Australia. This may also include sites that are not known to, or formally registered with, the Aboriginal Affairs Department and Aboriginal Cultural Material Committee (ACMC).

The number of significant Aboriginal sites within the City of Rockingham that are lodged on the Register has increased by four since the interim report (Table 53), and include Mooribirdup Ceremonial Grounds and Burial Site, Mooribirdup Hunting and Fishing Areas, and Mersey Point Burial Site.

Table 53: Number of Aboriginal sites protected under the Act (1972)

	No. of Registered and Protected Aboriginal sites
2001-2002	25
2004	35
2007	37
2009	41

(Source: ACMC 2009)

Indicator Trend

The objective is to "Retain the number of protected sites". The information in Table 53 indicates that the number of significant Aboriginal sites within the City of Rockingham has increased, which is consistent with the City's objective.

Effectiveness of Indicator

The indicator is effective.

Proposed Indicator Changes

Nil.

Indicator 9.2- Number of Non-Aboriginal Heritage Sites Protected

Indicator Description

The Heritage of Western Australia Act (1990) requires all local government authorities to compile, and periodically update, a Municipal Heritage Inventory. In compliance with the Act (1990), the City recognises sites considered to have cultural heritage significance by including them on the Rockingham Municipal Heritage Inventory and within the Heritage List, contained within the Town Planning Scheme No. 2.

The number of non-aboriginal sites protected has remained constant with a total of 66 sites since the interim report⁷¹.

Table 54: No. of non-Aboriginal heritage sites protected

	No. of Protected non-Aboriginal Heritage sites
2001-2002	36
2004	60
2007	66
2009	66

(Source: Heritage Council of WA, 2009)

⁷¹ City of Rockingham, 2007

Indicator Trend

The objective is to "Increase the number of protected sites". Table 54 indicates that the City has not met this objective since the interim report.

Effectiveness of Indicator

The indicator is effective.

Proposed Indicator Changes

Nil.

Progress and Council Actions

The City is currently progressing with the following actions with relation to Heritage:

- Development of planning policy for protection of heritage sites in East Rockingham;
- Updating the Municipal Heritage Inventory and Heritage List;
- Prepared and reviewed Conservation Plans for particular heritage places including, the Old Abattoir Building;
- Continued collaboration with Nyoongar Elders to ensure heritage and significant sites within the community are identified; and
- Development of a Heritage database that includes contact information for Nyoongar Elders and key European community members that have a relationship to heritage and significant sites.

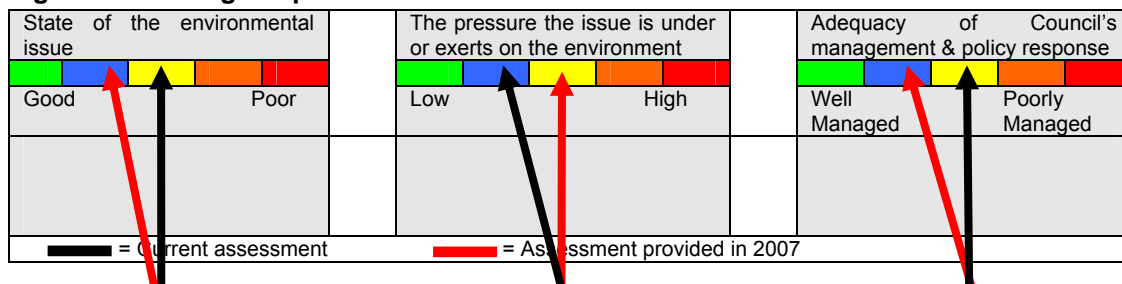
Assessment – Report Card

Table 55: Indicator Progress

No.	Indicator	Objective, Trend or Target	Progress
9.1	Number of significant Aboriginal Sites protected.	Retain No. of protected sites.	Number of protected sites has increased.
9.2	Number of non-Aboriginal Heritage sites protected.	Increase No. of protected sites.	Number of sites has remained constant.

Assessment

Figure 21: Heritage Report Card



Community Comments

Community members would like to see natural, European and Indigenous heritage sites identified and preserved with more information provided to the public about the history and protection of these significant sites and areas.

Conclusion

The 'State' of this issue has declined since the Interim Report. The 'Pressure' the issue is under has decreased, yet the Council's response is seen as 'Adequate'.

Environmental Action Plan

Table 56: Heritage Environmental Action Plan

Action	Aim	Responsibility	Priority	Progress 2007	Progress 2009	Further Action
Review Municipal Heritage Inventory and the Heritage List.	To review the Municipal Heritage Inventory (which is a list of places having cultural heritage significance compiled under the Heritage of WA Act 1990 and reviewed every four years) and the Heritage List (which provides statutory protection to places under Town Planning Scheme No.2).	Planning and Community, Capacity Building – Arts & Cultural Development.	High.	Council resolved to advertise the MHI (Stage 1 – consisting of the update of the information for existing places) and defer consideration of new places nominated for inclusion (Stage 2) pending assessment by the Heritage Advisory Committee.	Stage 1 of the review was completed, with the MHI being adopted, and a Heritage List and Conservation and Development Policy adopted by the Council. The first draft of the MHI (Stage 2) was prepared.	The Council is to finalise the draft MHI and following it seek the comment of affected owners/occupiers, and assess submissions.
To identify significant cultural sites to East Rockingham community.	To prepare a policy to guide the conservation and development of places in East Rockingham in a manner that does not detract from the heritage places along Mandurah and Day Roads.	Planning and Community, Capacity Building – Arts & Cultural Development.	High.	Council resolved to designate the East Rockingham Heritage Area and prepare a planning policy for the East Rockingham Heritage Area.	The City has been working on the preparation of a planning policy for the East Rockingham Heritage Area.	Complete the East Rockingham Heritage Area Policy.
Relocation of Elanora.	To relocate and restore Elanora, a historical building originally located at 49 Rockingham Beach Road.	Planning and Community, Capacity Building – Arts & Cultural Development.	Low.	In April 2007 Elanora was relocated to the Council depot for temporary storage, awaiting the identification of a permanent site for its relocation.	A Conservation Plan was prepared to guide the conservation and restoration of Elanora.	Investigate the cost and funding options for relocating Elanora, and identify a suitable site and use for the building.
Conservation of the Old Abattoir.	To conserve and restore the Old Abattoir, on the corner of Dixon Road and Darile Street, Hillman.	Planning and Community, Capacity Building – Arts & Cultural Development.	Low.	The Council had preliminary discussions with the Department for Planning and Infrastructure regarding obtaining an Area Assistance Grant for the vesting of the land on which the Old Abattoir is located with the City of Rockingham.	A draft Conservation Plan, which is used to guide the conservation of the building, was prepared.	Following the finalisation of the Conservation Plan, the City is to seek an Area Assistance Grant for the vesting of the land in the City, with the grant potentially to be used towards the restoration and adaptation of the Old Abattoir.
Interpretation of Peelhurst Cottage Ruins	To undertake conservation and/or interpretation of the Peelhurst Cottage ruins on Dampier Drive, Golden Bay.	Planning and Community, Capacity Building – Arts & Cultural Development.	Low.	N/A as new action.	Preliminary investigations were undertaken for the interpretation of Peelhurst and other sites.	Continue to progress the preparation of an interpretation strategy for Rockingham through the City's Culture Policy and Plan.

Action	Aim	Responsibility	Priority	Progress 2007	Progress 2009	Further Action
Development of an Aboriginal heritage local protocol for dealing with issues within the City.	Re- establish the Indigenous Protocol group and develop protocol in consultation with this group	Community Capacity Building: Cultural Development.	High	N/A as new action	N/A as new action	Advertise for expressions of interest for a Nyoongar Consultant to head the Indigenous Protocol Group.
Develop and maintain a database of groups in area who can be consulted with relation to Heritage (Nyoongar & European)	Development of a list of groups and individuals that have a relationship with heritage and significant sites in Rockingham.	Planning and Community, Capacity Building – Arts & Cultural Development.	Low	N/A as new action	N/A as new action	Engage a consultant to identify Nyoongar Elders and key European community members that have a relationship to Heritage sites and to develop the database for further consultation.

Issue 10 – Noise

Description of Issue

The proximity of industrial developments to urban areas has the potential to create conflicts, especially with regard to air and water pollution and waste disposal and noise. The issues of pollution and waste have been discussed in other sections.

Industrial-related noise is regulated by the Environmental Protection Act (1986) Environmental Protection Noise Regulations. The DEC administers these regulations for the Kwinana Industrial Area, whereas local government regulates noise control for the residential and commercial sectors⁷². Noise from moving sources like traffic, trucks and trains are exempt from the regulations but the DEC works with the various agencies to establish noise guidelines. For example, as part of the environmental assessment of the Perth to Bunbury Highway, noise levels and noise management measures were agreed to between the EPA and the DEC.

The most significant noise issue involves noise from industry affecting people who live in the north of the City adjacent to the Kwinana Industrial Area. The Kwinana Industries Council (KIC) has been active in addressing the noise issue and has recently completed a noise monitoring study, which indicated that cumulative noise levels do exceed DoE standards in this area⁷³.

Residents in North-East Rockingham have been concerned for many years that noise levels from industry cause ambient noise level to exceed limits allowed under the Noise Regulations. Council supports residents in having these claims investigated, and to have industry better manage its noise impacts.

Threats

The key threats with regard to noise in Rockingham include:

- The cumulative effects of industrial noise within the Kwinana and East Rockingham area;
- Future noise impacts that may result from an expansion of industry at Kwinana and in the East Rockingham area; and
- Increased development and smaller residential lots.

Indicators and Objectives

Table 57: Key indicators for “Noise”

No	Indicators	Objective Trend or Target
10.1	Number of written noise complaints concerning heavy industry made to the Department of Environment by Rockingham residents.	Reduction in number of complaints.
10.2	Number of commercial and residential related noise complaints made to the City of Rockingham.	Complaints to be responded to within 5 working days.

⁷² Environmental Protection Authority, 2007

⁷³ Kwinana Industries Council, 2008

Indicators for Noise

Indicator 10.1 – Number of written noise complaints concerning heavy industry made to the DEC by Rockingham residents

Indicator Description

There have been no written industry related noise complaints reported to the DEC since the 2006/2007 Interim Report as shown in Table 58.

Table 58: Industrial-related noise complaints made to the DEC by residents

Year	Complaints
2000	351
2001	17
2002	47
2003	12
2004	9
2005	2
2006	0
2007	0
2008	0

(Source: DEC 2009)

Indicator Trend

The objective is a “Reduction in number of noise complaints made to DEC”. The number of noise complaints has remained at zero in reduced in recent years, which is consistent with the objective.

Effectiveness of Indicator

The Indicator does not reflect noise complaints for the residential sector.

Proposed Indicator Changes

Addition of Indicator 10.2 – ‘Number of commercial and residential related noise complaints made to the City of Rockingham’

Indicator 10.2 – Number of commercial and residential related noise complaints made to the City of Rockingham

Indicator Description

In recent years, residential and commercial noise complaints from sources such as construction, stereos, and power tools have far out numbered industrial noise complaints, as highlighted in Table 59.

Table 59: Number of residential and commercial noise complaints received by the City of Rockingham

Category	2008	2009
Special Equipment (e.g. power tools)	43	17
Pool Pumps	8	6
Animals	11	3
General (e.g. parties)	30	10
Stereos	87	51
Musical Instruments	17	7
Licensed Premises (e.g. pubs & clubs)	4	0
Construction	12	4
Air Conditioning	29	5
Totals	241	103

(Source: City of Rockingham 2008)

Indicator Trend

The objective for this proposed indicator is that is that all complaints received by the City are to be responded to within 5 working days. This information will be reported on in the next Interim Report.

Effectiveness of Indicator

N/A.

Proposed Indicator Changes

Nil.

Progress and Council Actions

The Council is currently progressing with the following actions with relation to Noise:

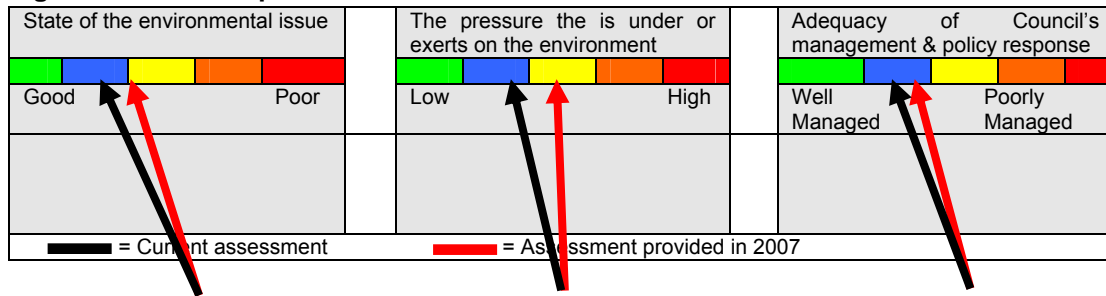
- Continuing to attend KIC Noise Reference Group Meetings; and
- Investigating a new indicator relating to the amount of households subject to noise accedence of assigned noise levels.

Assessment – Report Card**Table 60: Indicator Progress**

No.	Indicator	Objective, Trend or Target	Progress
10.1	Number of written noise complaints concerning heavy industry made to the Department of Environment by Rockingham residents	Reduction in number of complaints	There have been no written complaints to DEC for over 3 years.
10.2	Number of commercial and residential related noise complaints made to the City of Rockingham	Complaints to be responded to within 5 working days	New indicator.

Assessment

Figure 22: Noise Report Card



Community Comments

Noise is a low priority issue to the community. Noise concerns were related to jet skis, traffic and occasional social events.

Conclusion

The 'State' of this issue has improved since the Interim Report, the 'Pressure' has decreased and the Council's response is seen as being more than 'Adequate'.

Environmental Action Plan

Table 61: Noise Environmental Action Plan

Action	Aim	Responsibility	Priority	Progress 2007	Progress 2009	Further Action
Co-ordinated approach by Industry, Local Govt, DoE, Kwinana Industries Council and the Community through the KIC Noise Reference Group to address noise (including cumulative noise) emanating from Industry.	To develop and implement a strategy to ensure acceptable industrial noise levels in the North - East Rockingham residential area and to ensure representation with State Government.	City of Rockingham - Health Services.	High	The City is a member of the Noise Reference Group chaired by DoIR, which meets regularly to consider noise issues and receives feedback from industry, community and Government	Noise Reference Group meetings still attended by CoR.	Nil
Implementation of Noise Reduction Strategies.	To implement a strategy to ensure acceptable industrial noise levels in North-East Rockingham residential area.	Department of Environment and Conservation; City of Rockingham Health Services.	Ongoing.	No complaints received from East Rockingham area in the past 18 months.	No complaints received by DEC in past 3 years.	Nil.
Establish a noise monitoring station in North-East Rockingham.	To establish noise monitoring at North-east Rockingham.	City of Rockingham - Health Services.	Ongoing	Nickel West have a static monitoring station and Council Noise Officers and Kwinana Industry Council (KIC) have undertaken joint monitoring to compare data from KIC's Cumulative Noise Study.	Monitoring is still ongoing and results provided to CoR by KIC. No issues flagged through monitoring.	Nil
Continue to ensure that noise impacts are addressed as part of major development in the Kwinana Industrial Area.	To reduce noise impacts resulting from new industry development in Kwinana Industrial Area	Strategic Planning and Environment	Ongoing	The City is a member of the Noise Monitoring Group chaired by DoIR, which meets regularly to consider noise issues and receives feedback from industry, community and Government	The City is a member of the Noise Monitoring Group chaired by DoIR, which meets regularly to consider noise issues and receives feedback from industry, community and Government	Continue with membership to DoIR.
Investigate a new indicator relating to the amount of households subject to noise accedence of assigned noise levels.	To determine the number of households that are subject to accedence of assigned noise levels.	City of Rockingham - Health Services.	High	New Indicator in 2009	Respond to residential noise complaints within 5 working days.	Statistics for this indicator will be provided form June 2009.

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APPENDIX 1

Environmental Action Plan 2008/2009

Bushland

Action	Aim	Responsibility	Priority	Progress 2007	Progress 2009	Further Action
Management Plans						
Develop an inventory of the CoR conservation reserves with current management plans and track progress of implementation.	To ensure conservation objectives are met.	City of Rockingham - Engineering & Parks; Strategic Planning and Environment.	High	Implementation on going.	Inventory has been developed.	Management plans to be updated over time and actions implemented.
Progress implementation of the Tramway Management Plan.	To fulfil Management Plan objectives.	City of Rockingham - Engineering & Parks.	Medium		Have currently completed revegetation in 3 sections of the Baldivis Tramway Reserve in cooperation with subdividers and developers.	Continue to liaise with developers with relation to the protection and promotion of the Baldivis Tramway Reserve in addition to CoR management.
Extend management responsibility for Dixon Road as part of Rockingham Lakes Regional Park (RLRP).	To ensure Dixon Road bushland is managed appropriately.	City of Rockingham - Strategic Planning and Environment; Engineering & Parks.	Medium	Awaiting finalisation of the Rockingham Lakes Regional Parks Management Plan	Council endorsed content of Rockingham Regional Lakes Management Plan in May 2008, and awaiting final management plan from DEC.	Potentially CoR will take on responsibility for Lot 902, Bush Forever site as an offset for Mundijong Rd - will require upgrade the wetland, potentially take on management of Dixon Road and Tamworth if Area Assistance Grant from the WAPC is forthcoming.
Undertake a study into the nature and extent of the feral animal problem in Council managed Reserves.	To ensure that the biodiversity of Council Reserves is not compromised through feral animals.	City of Rockingham - Strategic Planning and Environment; Engineering & Parks.	Medium.	New Action.	Anecdotal information has been provided by officers that undertake onground work and from the community.	There are no immediate plans to undertake a formal investigation.
Develop and implement a local strategy to manage the impacts of weeds in the agricultural area.	To control weed spread and the disturbance of weeds in the agricultural area.	City of Rockingham - Engineering & Parks; Strategic Planning and Environment.	Medium	New Action.	Draft weed strategy was developed and adopted in 2008.	Implementation of weed strategy in Rural area.
Investigate potential additional weed management actions for City managed street verges.	To manage weed spread and the potential disturbance of weeds on street verges.	City of Rockingham - Engineering & Parks.	Medium	New Action.	Verges that abut significant bushland have weed control strategies and management undertaken, including private verges if evident that a resident isn't undertaking maintenance.	Undertaken as part of general maintenance programme.

Bushland

Action	Aim	Responsibility	Priority	Progress 2007	Progress 2009	Further Action
Bushland in the Rural Zone						
Identify and prioritise degraded bushland with potential for rehabilitation.	To identify and protect Bushland in the City of Rockingham.	City of Rockingham - Strategic Planning and Environment; Engineering and Parks.	Medium	Completed Prioritisation of Reserves Report. Need to discuss further with Parks Service.	Local Biodiversity Strategy has provided an indication of the condition of vegetation within the City and prioritised the vegetation complexes.	Specific actions from Biodiversity Strategy currently under review.
Develop management plans to conserve those areas of remnant vegetation identified in Perth's 'Bush Forever' and vested with the City.	To protect regionally significant vegetation vested in the City.	City of Rockingham - Strategic Planning and Environment.	Medium	SPP (draft) has been released requiring Local Governments to complete Management Plans - ongoing.	Management Plan required when development abuts Bush forever site, not at other times.	Local Biodiversity Strategy has prioritised bushland in the City and specific actions will be developed when this is reviewed.
To work with State Government to find an appropriate means of protecting regionally significant bushland on privately owned land.	To protect regionally significant vegetation vested in the CoR.	City of Rockingham - Strategic Planning and Environment.	Medium	Ongoing liaison and implementation with DOP to protect various regionally significant vegetation sites (i.e. Doghill Road Mgt Plan and Stakehill Swamp).	On a case by case basis.	Nil.
To work with Perth Biodiversity Project to find an appropriate means of protecting locally significant vegetation on privately owned land.	Encourage retention of locally significant vegetation that is on privately owned land.	City of Rockingham - Strategic Planning and Environment.	High	Still contributing to the Perth Biodiversity Project.	Still ongoing; 12 months extra funding obtained in 2009.	Review of Local Biodiversity Strategy and the development of a CoR Local Biodiversity Strategy will aid in the identification and retention of significant bushland.
Continue to monitor the impacts of trail bikes and 4WD vehicles and take action to prevent their improper use in bushland areas.	To prevent disturbance to bushland areas through unauthorised 4WD and trail bike use.	City of Rockingham - Rangers Services.	High	Monitoring.	General patrols and immediate investigation of any reports of unauthorised 4WD and trail bike use.	Nil.
Continue to offer grants for the better management of weeds through the Biodiversity Grant Scheme.	To offer incentives to private landowners to manage weeds in Rural areas.	City of Rockingham - Strategic Planning and Environment.	Medium	Biodiversity Grants Programme continuing.	Project on hold for 2009. Money has been reallocated to be used for Biodiversity Project.	To be reviewed in 2010.

Coastal Foreshore

Action	Aim	Responsibility	Priority	Progress 2007	Progress 2009	Further Action
Prepare and implement detailed Foreshore Management Plan(s) following/as part of review and in accordance with the City of Rockingham Foreshore Strategy.	To ensure Rockingham's entire foreshore is managed appropriately.	City of Rockingham - Engineering & Parks and Strategic Planning and Environment.	Medium	Funding for facilities and foreshore development is being progressively implemented as part of the 5 year Parks development and city projects programme.	Implementation strategies are being developed for all local beach precincts to aid in identification, reporting process & the management of the Regional Foreshore Reserve. This includes restricted access to occur on beach paths, brushing, planting strategies; and Adopt a Beach Programme for schools.	Continue with development of Implementation Strategies.
Continue to monitor the impacts of trail bikes and 4WD vehicles and take action to prevent their improper use in coastal foreshore areas.	To prevent disturbance to coastal foreshore areas through unauthorised 4WD and trail bike use.	City of Rockingham - Rangers Services.	High	Ongoing.	General patrols and immediate investigation of any reports of unauthorised 4WD and trail bike use.	Continue patrols and investigation of reports.

Inland Waters

Action	Aim	Responsibility	Priority	Progress 2007	Progress 2009	Further Action
Monitor health of wetlands.	To ensure management plans are protecting wetlands and buffers.	City of Rockingham - Engineering and Parks; Strategic Planning & Environment.	Medium	A progress report on the monitoring has been completed. Currently hand over of this project from Parks to Environmental Planning being negotiated.	Urban Wetland and Drainage Swale Study completed in 2008 & the first round of monitoring completed in Sept 2009 with additional sampling to take place at the end of summer 2010. Wetlands that are monitored were identified in the Urban Wetland and Drainage Swale Study 2008 as having management issues.	Recommendations from the monitoring reports are currently being undertaken by Engineering and Parks.
Develop & implement a Water Quality Management Plan for the Main Drains (with the Water Corporation).	To improve drain water quality and flow regime to improve water quality (and reduce the number of duck deaths).	City of Rockingham - Engineering and Parks; Water Corporation.	Medium	Vegetated buffers have been installed along the length of the Anchorage residential development, with designs developed in partnership between Australand & CoR.	Water Quality Management Plan not completed, but actions are mentioned in Lake Richmond Management Plan; predominantly Water Corporation land and hence their action is required.	Better partnership between CoR and Water Corporation needs to be built to ensure the Water Quality Management Plan for the Main Drains can be developed.
Complete and implement Wetland Management Plans for the City's wetlands.	To protect environmental values of the wetland including water quality.	City of Rockingham - Engineering and Parks; Strategic Planning & Environment.	High	All approvals now require development to prevent direct discharge into wetlands. Funding for storm water improvements on previous installations is now being undertaken on a staged basis.	Lake Richmond Management Plan has been accepted, not endorsed by Council; Engineering and Parks currently developing an Action Plan & Implementation Strategy for the Management Plan recommendations.	Completion of Action Plan and Implementation Strategy.
For Stakehill Swamp, identify wetland conservation areas that require management plans and develop and implement those plans by working with landowners and State Government.	To ensure Ongoing protection of the wetland and buffer.	City of Rockingham - Engineering and Parks; Strategic Planning & Environment.	High	The MRS Amendment process is yet to be completed. The Minister for the Environment has dealt with appeals associated with the Environmental Assessment; however the final boundary of the reserve is yet to be determined. The LPS Amendment is being held pending the finalisation of the MRS reserve boundary.	MRS Amendment process is complete and the land has now been vested as Parks and Recreation Reserve and the wetland boundary defined; Wetland MP has yet to be completed.	Management Plan to be completed by the DOP or subsequent developer.

Inland Waters

Action	Aim	Responsibility	Priority	Progress 2007	Progress 2009	Further Action
Use of education signage etc at wetlands.	To increase public awareness and understanding of wetland values/function	City of Rockingham - Engineering and Parks.	Medium	Interpretive signage is being retrofitted to old lakes/wetlands and included in new developments adjacent to wetlands e.g. Lark Hill Sports Complex and Kennedy Bay.	Signage installation completed at Anstey Q and Larkhill, this includes signage on the Rights and Concerns of citizens, Don't Feed the Ducks, Wildlife Information and Vegetation Complex information.	On going in locations where needed.
Undertake actions to improve water quality in degraded Urban Wetlands.	To improve water quality in Urban Wetlands.	City of Rockingham - Engineering and Parks.	High	Parks Services have undertaken a programme with the local community to upgrade Reflection Mews lake. This involved planting, new water aeration equipment and delivery of brochures regarding nutrient management throughout the community. Grant obtained from Swan Catchment Council.	In Sunlight Park, St Raphael, Don Cuthbertson, Centenary park, Harmony Lake and St Clair works have been undertaken to improve water quality, have had aeration.	These actions are covered in an above action "Monitor Health of Wetlands". Remove action.
City of Rockingham representation on Peel Harvey Officers Group Committee and the Water Sensitive Urban Design Peel-Harvey Committee.	To improve water quality in Peel-Harvey Catchment through subdivision and development.	City of Rockingham - Engineering and Parks.	Medium	On-going (irregular meetings).	On-going (irregular meetings).	In light of development near the Peel Harvey Inlet, investigations should be made to explore the value of returning to this group.
Investigate the issues of access, fire control and general management of wetlands within the Unexploded Ordinances (UXO) zone.	Ensure these issues affected by UXO are addressed adequately.	City of Rockingham - Engineering and Parks.	Medium	Survey undertaken and plan made outlining areas deep searched, surface searched and not searched.	UXO information has been updated and is available via the CoR website, along with a map of locations.	Nil.

Inland Waters

Action	Aim	Responsibility	Priority	Progress 2007	Progress 2009	Further Action
City of Rockingham representation on Rockingham Lakes Regional Parks (RLRP) Community Advisory Committee to assist in ensuring that Lake Richmond and other areas of high scientific value are treated as high priorities for future management planning and implementation.	To ensure issues relating to local wetlands within the RLRP are addressed adequately and management plans developed.	City of Rockingham - Strategic Planning & Environment and Engineering and Parks.	Ongoing	Draft Management Plan for the Park remains incomplete.	Council endorsed content of Rockingham Regional Lakes Management Plan in May 2008, is and awaiting final management plan from DEC. Potentially CoR will take on responsibility for Lot 902, Bush Forever site as an offset for Mundijong Rd – this will require upgrade of the wetland and take over the land, potentially take on management of Dixon Road and Tamworth Swamp if Area Assistance Grant from the WAPC is forthcoming.	Awaiting finalisation of plan by DEC and outcomes of WAPC Area Assistance Grants.
Liaise with the DoE to ensure that planning decisions take into consideration groundwater availability, the sustainable management of groundwater and the need for licensing of groundwater.	To maintain groundwater use within sustainable yield.	City of Rockingham - Strategic Planning & Environment.	Ongoing	Ongoing liaison on a case by case basis	Rockingham Stakehill Groundwater Resource Review is complete and this report identifies which aquifers within the Rockingham area are fully allocated.	CoR to report monthly on volumes used and currently looking at installing meters on every bore; June 2010 deadline for operating strategy to be complete. Monitoring to be reported quarterly.
Investigate potential impact of encroachment of saltwater.	To identify and prevent environmental impacts from saltwater encroachment	City of Rockingham - Engineering and Parks; Strategic Planning & Environment.	Low	The north-western movement of lake Cooloongup salinity plume has been identified and will continue to be monitored throughout the POS in Hillman and along the length of Dixon Road precinct.	Conductivity and water analysis monitoring is undertaken annually every November. There has been no change from previous results and hence there have been no additional actions.	Continue monitoring on an annual basis.
International Council for Local Environmental Initiatives (ICLEI) Water Campaign.	To consider Council's involvement in the ICLEI Campaign as part of efforts to improve water efficiency and use at the City.	City of Rockingham - Engineering & Parks; Strategic Planning and Environment.	Medium	Council has signed on to this programme. Inventory will be completed 2007/2008 Financial Year.	The City has completed Milestone 3 and are currently undertaking Milestone 4.	Preparation of Planning Procedure 1.7 - Water Sensitive Urban Design; community education on reduced water use and water wise initiatives; and adopting the Fertilizer and Herbicide Application Guidelines for Staff and Contractors.

Inland Waters

Action	Aim	Responsibility	Priority	Progress 2007	Progress 2009	Further Action
Work with the Town of Kwinana and the City of Cockburn to develop a community education project related to urban nutrient management for both the Peel Harvey Catchment and the Cockburn Sound Catchment, and seek funds from Natural Heritage Trust for its implementation.	To control nutrient input into the Peel Harvey and Cockburn Sound Catchments.	City of Rockingham - Engineering & Parks; Strategic Planning and Environment.	Medium	The Peel Harvey Draft Policy is currently being reviewed. From this a review of the Cockburn Sound Catchment Policy will take place.	The City has adopted the Statement of Planning Policy 7.3 Local Planning Policy for the Cockburn Sound Catchment.	Cockburn Sound Management Council are due to review the Statement of Planning Policy 7.3 and provide feedback to the City.

Coastal Waters

Action	Aim	Responsibility	Priority	Progress 2007	Progress 2009	Further Action
Seagrass in Mangles Bay						
Ensure Seagrass Protection Plan is developed & implemented in conjunction with development of any marina in the Mangles Bay area. As such, Council officers will meet with officers of the CSMC to discuss a collaborative project to map seagrass cover in Cockburn Sound.	To protect seagrass.	City of Rockingham - Strategic Planning and Environment.	High	Not yet commenced.	To date there has been no collaboration between the City and the Cockburn Sound Management Council.	Progress communication with the Cockburn Sound Management Council.
Develop during 2006/07 and subsequently implement a programme to improve, & where possible, remove stormwater drains that discharge into Cockburn Sound & other marine areas.	To reduce pollutants reaching coastal waters through the stormwater drainage system.	City of Rockingham - Engineering & Parks; Strategic Planning and Environment.	High	Plans to undertake modifications to the drainage into the Rockingham Beach area commencing in 2007/2008.	Has been progressed; Bell Park, Churchill Park, Palm Beach and Esplanade completed; Feasibility study currently being undertaken for Stage 3 Warnbro Sound, looking at infiltration basins or underground storage.	Proposed drainages works to commence in 2011; Kwinana outfall will be looked at following completion of Stage 3.
Provide input into Cockburn Sound Environmental Management Plan through representation on Cockburn Sound Management Council.	To improve the water quality in Cockburn Sound.	City of Rockingham - Strategic Planning and Environment.	High	Ongoing.	A councillor sits as representative on the Cockburn Sound Management Council and reports back on issues of interest and relevance to the City.	Nil.
To ensure all development affecting Cockburn Sound is consistent with State Environmental (Cockburn Sound) Policy 2005, & Environmental Management Plan for Cockburn Sound & Catchment 2005.	To improve the water quality in ocean waters and adjacent Cockburn Sound.	Water Corporation; City of Rockingham - Strategic Planning and Environment.	High	Ongoing.	All development complies with this policy.	Action can be removed as all development complies with this policy.
Beach Closures						
Monitor water quality along Rockingham coast.	Ensure Ongoing information is provided about water quality along the coastline.	City of Rockingham - Health Services.	Ongoing	The City works in conjunction with the Department of Health to monitor beaches. All results are posted on the Department of Health website: www.healthyswimming.wa.gov.au	Monitoring undertaken by CoR Health Department and reported to WA department of Health. Monitoring occurs throughout the swimming period, from November to April. A total of 20 samples are taken during these months.	Monitoring to continue.

Coastal Waters

Action	Aim	Responsibility	Priority	Progress 2007	Progress 2009	Further Action
Foreshore Management Plans						
Review existing and instigate new Foreshore Management Plans.	Ensure efficient use of fertiliser & reticulation on foreshore reserves to reduce potential for export of nutrient to coastal waters.	City of Rockingham - Engineering & Parks; Strategic Planning and Environment.	Ongoing	Review existing and instigate new Foreshore Management Plans (FMPs) (on a case by case basis).	Review of FMPs is being undertaken when required. Also there are regular meetings with Cockburn Sound Management Council, DEC and the Department of Transport.	Nil.

Waste

Action	Aim	Responsibility	Priority	Progress 2007	Progress 2009	Further Action
Waste Produced						
Implement the waste minimisation policy adopted by Council in line with Southern Metropolitan Regional Council Agreement.	To increase recycling of waste and reduce waste to landfill.	City of Rockingham - Waste Services.	Medium	Ongoing.	Ongoing.	Policy to be reviewed in line with Carbon Pollution Reduction Scheme in 2009/2010
Promoted household waste reduction programmes in the City of Rockingham.	Reduce household waste production.	City of Rockingham - Engineering & Parks.	Medium	Continued commitment with RRRC and SMRC. Development of waste education at Millar Road in progress in 2007/2008.	Ongoing.	Still ongoing; waste reduction, recycling and reuse information included in yearly waste calendar distributed to households. Waste education programme at Millar Road facility ongoing.
Recycling						
Introduce a green waste collection service.	To implement a comprehensive green waste collection service.	City of Rockingham - Waste Services.	Medium	Ongoing through SMRC contractor.	Ongoing through CoR contractor.	Ongoing through CoR contractor.
Reuse green waste from City Parks and waste collection service.	To recycle green waste and provide resources for Parks Department & community.	City of Rockingham - Waste Services.	Medium	Ongoing	Continually ongoing.	Looking at feasibility of a composting plant; Investigating the possibility of selling compost rather than giving it away; bulk greenwaste sometimes used as brushing on dunes as part of rehabilitation.
Develop a sustainable green waste reuse strategy on a regional basis.	To ensure efficient reuse of green waste.	City of Rockingham - Engineering & Parks.	High	Green waste mulching service Ongoing.	Green waste mulching service Ongoing.	Investigating making the much a saleable product through new technologies (tunnel composting instead of windrow)
Review option for 3rd bin for organics or weekly recycling collections		City of Rockingham - Waste Services.		NA	NA	New Action - Pending the final report, Council will decide on viability, where the organic waste stream will go and how the product will be used.

Energy

Action	Aim	Responsibility	Priority	Progress 2007	Progress 2009	Further Action
Greenhouse Gas Emissions – Electricity						
Prepare an inventory of Greenhouse Gas emissions from Corporate and Community sources.	To provide baseline data against which to measure reductions.	City of Rockingham - Strategic Planning and Environment.	Ongoing	Corporate Inventory completed. Next proposed inventory scheduled for 2007.	Inventory completed in 2007; Actions being undertaken and a report being compiled. Measures Report completed in 2007.	Re-inventory to be completed in 2010 using Planet Footprint Reports and CCP data. Measures Report will also be completed in 2010.
Engage specialist consultants to conduct energy use audits of major Council buildings.	To identify actions which can be implemented to reduce corporate energy use.	City of Rockingham - Strategic Planning and Environment; Engineering & Parks.	High	Greenhouse Gas Emission Audit completed for the Safety Bay Library, Warnbro Recreation Centre, Aqua Jetty, Mike Barnett Sport Complex and Council Depot.	Aqua Jetty investigated use of solar Hot Water System, and the use of geothermal energy; Administration Building audited in 2008 and actions are currently being implemented.	Recommendations from the Administration Building audit are to be implemented. Next building to be audited will be selected in early 2010 in consultation with Asset Maintenance.
Develop and implement a Community Greenhouse Reduction Programme.	To reduce the Greenhouse Gas emissions in the City of Rockingham.	City of Rockingham - Strategic Planning and Environment.	High	Reviewed Regional Greenhouse Strategic Community Plan (South West Corp) The SMRC has employed a Regional Greenhouse Gas Education Officer.	SMRC Programme rebranded to 'Climate Wise'. CoR supports & promotes this programme. Dry Cell Battery recycling bins have been placed in key administration buildings around the City in conjunction with the SMRC.	Continue to work with SMRC on Climatewise programme; Develop possible product discount proposal for community rebates on sustainable energy technology.
Progress City's participation in CCP programme and implement the Local Action Plan (LAP) for the corporate sector.	To reduce the Greenhouse Gas emissions in the City of Rockingham.	City of Rockingham - Strategic Planning and Environment.	Ongoing	Completed Milestone 5, and the City is now at CCP plus.	CCP no longer running; CoR is looking at alternative ways to undertake actions.	The City is exploring the value of participating in the CCP Partners Programme.
Progress City's participation in CCP Programme and set a Greenhouse Gas reduction goal for the community.	To reduce the Greenhouse Gas emissions in the City of Rockingham.	City of Rockingham - Strategic Planning and Environment; Engineering & Parks.	Medium	Ongoing. Regional Community Action Plan to reduce Community GHG has been reviewed & the SMRC has employed a Regional Greenhouse Gas Education Officer.	CCP no longer running; CoR is looking at alternative ways to undertake actions.	The City is exploring the value of participating in the CCP Partners Programme. Investigating goal setting with relation to GHG emissions within the community.
Implement methane extraction at Millar Road Landfill site.		City of Rockingham - Engineering & Parks.	Ongoing	Landfill gas extraction is on going with energy produced contributing to the Rockingham power grid.	Is undertaken; reported on yearly.	Continue with methane extraction and yearly reporting.

Energy

Action	Aim	Responsibility	Priority	Progress 2007	Progress 2009	Further Action
Greenhouse Gas Emissions – Public Transport Patronage						
Promote public transport use to, from and within the City.	To reduce the number of short, single occupant, car journeys to reduce Greenhouse Gas emissions.	City of Rockingham - Planning & Development Services.	Medium	Currently developing the Rockingham City Centre Transit Strategy (bus services) to be implemented 2006 in conjunction with the Railway completion. Funding received for an Integrated Transport Plan to be commenced 2005/06.	Rockingham City Centre Transit Strategy has been implemented and the Shuttle bus operational around the City; Town Planning Scheme – Car Parking (Bicycle end of trip facilities) is complete.	Continue to implement the Rockingham Bike Plan and carry out minor infrastructure works; Review Station Access and implement minor works as necessary; Ensure developers adhere to Town Planning Scheme – Car Parking (Bicycle end of trip facilities) – Policy; Pedestrian Access Way Strategy is under review; Lobby for increased off peak frequencies and accessible buses; Green Travel Choices info stand displayed at events.
Investigate instigating TravelSmart Programme.	To reduce Greenhouse Gas emissions.	City of Rockingham - Recreation Department; Strategic Planning and Environment; Engineering & Parks.	Medium	TravelSmart Programme commenced.	TravelSmart program was undertaken in Rockingham, Cooloongup & Hillman in 2007; report on the effectiveness of this programme has been completed.	TravelSmart programme has ceased. The City will continue to use information from report in implementing other programmes.
To produce a Vehicle Fleet Greenhouse Gas Policy.	To reduce Greenhouse Gas emissions.	City of Rockingham - Engineering & Parks.	Medium	Commenced.	Light Vehicle Fleet Policy has been adopted & all new vehicles purchased must meet a minimum 3.5 star rating based on Australian Government Green Vehicle Guide Star Rating. (Current average Council Green Star Rating 3.32).	To continue to improve the environmental performance of the light vehicle fleet with the objective of achieving a 4 Star Australian Government Green Vehicle Guide rating across the entire fleet.

Energy

Action	Aim	Responsibility	Priority	Progress 2007	Progress 2009	Further Action
Greenhouse Gas Emissions – Public Transport Patronage						
Implement further Greenhouse Gas mitigation projects.	To reduce Greenhouse Gas emissions.	City of Rockingham - Engineering & Parks; Strategic Planning and Environment.	Medium	A number of Greenhouse Gas Mitigation Projects are on going and commencing to assist the City meets its set goals.	A number of Greenhouse Gas Mitigation Projects are on going and commencing to assist the City meets its set goals.	Investigate the feasibility of conducting a staff sustainability education programme; Development of Sustainable Purchasing Policy; Implement findings of 2008 energy Audit of Council Administration Building; Community Environmental Education programmes - Sustainability Education Programme and Solar Schools.
Encourage the use of bicycles through development of bike paths and implementation of 'Bikeplan'.	To reduce Greenhouse Gas emissions.	City of Rockingham - Engineering Services.	Ongoing	Promote and expand the Bikeplan through the upgrading and extension of cycle paths throughout the City. Prepare promotional pamphlets for public use.	Bike Plan exists, now being implemented through minor works; upgrades to bike paths and signage, bike shelters, etc.	Continue works as part of the implementation of the BikePlan, including minor infrastructure works.
Prepare and implement an Integrated Transport Plan.	To better integrate private/public transport throughout the City.	City of Rockingham - Engineering & Parks; Planning and Development Services.	High	Funding pursued and received from DPI for preparation of a plan in 2005/06.	Plan completed in 2007. Implementation of recommendations currently taking place.	Implementation of plan still ongoing, including: PAW (Public Access Way) Strategy; Monitoring Park n' Ride demand and review of station access and community based approach to Local Area Traffic Management.

Land Management

Action	Aim	Responsibility	Priority	Progress 2007	Progress 2009	Further Action
Require Environmental Audits of suspected contaminated sites as an approval condition.	To identify contaminated sites prior to further development of land.	City of Rockingham - Development & Planning Services; Building Services.	Medium	Ongoing.	Undertaken on a case by case basis.	Continue investigation.
Ensure any resource extraction approvals include condition for rehabilitation to original state.	To prevent degradation.	City of Rockingham - Development & Planning Services; Engineering & Parks.	Medium	Rehabilitation forms part of the development as an approval condition.	Undertaken on a case by case basis.	Continue investigation.
Investigate Natural Heritage Trust funding opportunities in collaboration with the City of Cockburn and the Town of Kwinana for an educational programme or incentives programme for rural landowners to improve land management practices.	To improve land management on private landholdings.	City of Rockingham - Strategic Planning and Environment.	Medium	No action to date.	No action to date.	No action to date.

Atmosphere

Action	Aim	Responsibility	Priority	Progress 2007	Progress 2009	Further Action
Levels of NO₂, SO₂ & O₃						
City of Rockingham to follow up with the DoE any breaches of Ozone, Nitrogen dioxide, Sulphur dioxide concentration standards on review of quarterly air quality report.	To assist the DoE in reducing the incidence of air pollution events.	City of Rockingham - Health Services.	Ongoing	No breaches to follow up	No breaches to follow up.	Nil.
City of Rockingham to support implementation and provide input into the review of Kwinana EPP.	To protect air quality.	City of Rockingham - Strategic Planning and Environment.	Ongoing	Ongoing.	CoR provided input into the review of the Kwinana EPP and will support the outcomes of the review process.	Awaiting outcome of Kwinana EPP review.
Odour, smoke and dust						
Investigate ways of encouraging use of non-wood-burning heaters through the Building Application Approvals process.	To reduce incidence of haze and reduce and Greenhouse Gas emissions.	City of Rockingham - Building Services.	Medium	Working with DEC to encourage the replacement of wood heaters.	DEC did not coordinate the Perth Wood Heater Rebate Programme in 2009. No indication whether it will run in 2010. CoR respond to wood smoke complaints within 5 working days, and liaise with owners to ensure the wood heater is operated correctly to reduce visible smoke.	CoR would be prepared to be involved at some level, if the Perth Wood Heater Rebate Programme is run.
Develop and implement a City of Rockingham Burning-of Rubbish, Refuse & Vegetation policy.	To improve air quality and reduce number of smoke/haze complaints.	City of Rockingham - Health Services.	Medium	Policy established that requires all Rockingham residents to apply for a license prior to burning off outside fire restricted times.	Policy will continue to be implemented. All complaints are attended to as a matter of priority, if possible on the day they occur, but at the maximum within 5 working days.	Continue with follow up of complaints.
Ensure issues of odours, smoke, dust and noise considered as part of all development applications affecting Rockingham.	To improve air quality and reduce the incidence of odours, smoke/haze, dust and noise complaints.	City of Rockingham - Health Services; Strategic Planning and Environment.	High	Commenced and ongoing.	Ongoing.	Ongoing.
Wood fired Heaters						
Develop and implement Public Education programme to promote the correct methods for operating wood fired heaters.	To reduce the impact of wood fire heaters and as a result improve local air quality.	City of Rockingham - Health Services.	Medium	Through various media information is provided to the public on an ongoing basis.	Targeted education to neighbourhoods where there are complaints.	Continue education.

Atmosphere

Wood fired Heaters						
Action	Aim	Responsibility	Priority	Progress 2007	Progress 2009	Further Action
Introduction of combined Local Government/State Government Wood Fire Replacement Programme.	To reduce the impact of wood fire heaters and as a result improve local air quality.	City of Rockingham - Health Services.	Medium	DEC runs a programme that the City supports, although no budget is allocated to support the programme in terms of a buy back scheme.	Promote and support Perth Wood Heater Rebate Program when applicable (Currently not running in 2009).	Continue support when required.

Heritage

Action	Aim	Responsibility	Priority	Progress 2007	Progress 2009	Further Action
Review Municipal Heritage Inventory and the Heritage List.	To review the Municipal Heritage Inventory (which is a list of places having cultural heritage significance compiled under the Heritage of WA Act 1990 and reviewed every four years) and the Heritage List (which provides statutory protection to places under Town Planning Scheme No.2).	Planning and Community, Capacity Building – Arts & Cultural Development.	High.	Council resolved to advertise the MHI (Stage 1 – consisting of the update of the information for existing places) and defer consideration of new places nominated for inclusion (Stage 2) pending assessment by the Heritage Advisory Committee.	Stage 1 of the review was completed, with the MHI being adopted, and a Heritage List and Conservation and Development Policy adopted by the Council. The first draft of the MHI (Stage 2) was prepared.	The Council is to finalise the draft MHI and following it seek the comment of affected owners/occupiers, and assess submissions.
To identify significant cultural sites to East Rockingham community.	To prepare a policy to guide the conservation and development of places in East Rockingham in a manner that does not detract from the heritage places along Mandurah and Day Roads.	Planning and Community, Capacity Building – Arts & Cultural Development.	High.	Council resolved to designate the East Rockingham Heritage Area and prepare a planning policy for the East Rockingham Heritage Area.	The City has been working on the preparation of a planning policy for the East Rockingham Heritage Area.	Complete the East Rockingham Heritage Area Policy.
Relocation of Elanora.	To relocate and restore Elanora, a historical building originally located at 49 Rockingham Beach Road.	Planning and Community, Capacity Building – Arts & Cultural Development.	Low.	In April 2007 Elanora was relocated to the Council depot for temporary storage, awaiting the identification of a permanent site for its relocation.	A Conservation Plan was prepared to guide the conservation and restoration of Elanora.	Investigate the cost and funding options for relocating Elanora, and identify a suitable site and use for the building.
Conservation of the Old Abattoir.	To conserve and restore the Old Abattoir, on the corner of Dixon Road and Darile Street, Hillman.	Planning and Community, Capacity Building – Arts & Cultural Development.	Low.	The Council had preliminary discussions with the Department for Planning and Infrastructure regarding obtaining an Area Assistance Grant for the vesting of the land on which the Old Abattoir is located with the City of Rockingham.	A draft Conservation Plan, which is used to guide the conservation of the building, was prepared.	Following the finalisation of the Conservation Plan, the City is to seek an Area Assistance Grant for the vesting of the land in the City, with the grant potentially to be used towards the restoration and adaptation of the Old Abattoir.
Interpretation of Peelhurst Cottage Ruins	To undertake conservation and/or interpretation of the Peelhurst Cottage ruins on Dampier Drive, Golden Bay.	Planning and Community, Capacity Building – Arts & Cultural Development.	Low.	N/A as new action.	Preliminary investigations were undertaken for the interpretation of Peelhurst and other sites.	Continue to progress the preparation of an interpretation strategy for Rockingham through the City's Culture Policy and Plan.

Heritage

Action	Aim	Responsibility	Priority	Progress 2007	Progress 2009	Further Action
Development of an Aboriginal heritage local protocol for dealing with issues within the City.	Re- establish the Indigenous Protocol group and develop protocol in consultation with this group	Community Capacity Building: Cultural Development.	High	N/A as new action	N/A as new action	Advertise for expressions of interest for a Nyoongar Consultant to head the Indigenous Protocol Group.
Develop and maintain a database of groups in area who can be consulted with relation to Heritage (Nyoongar & European)	Development of a list of groups and individuals that have a relationship with heritage and significant sites in Rockingham.	Planning and Community, Capacity Building – Arts & Cultural Development.	Low	N/A as new action	N/A as new action	Engage a consultant to identify Nyoongar Elders and key European community members that have a relationship to Heritage sites and to develop the database for further consultation.

Noise

Action	Aim	Responsibility	Priority	Progress 2007	Progress 2009	Further Action
Co-ordinated approach by Industry, Local Govt, DoE, Kwinana Industries Council and the Community through the KIC Noise Reference Group to address noise (including cumulative noise) emanating from Industry.	To develop and implement a strategy to ensure acceptable industrial noise levels in the North - East Rockingham residential area and to ensure representation with State Government.	City of Rockingham - Health Services.	High	The City is a member of the Noise Reference Group chaired by DoIR, which meets regularly to consider noise issues and receives feedback from industry, community and Government	Noise Reference Group meetings still attended by CoR.	Nil
Implementation of Noise Reduction Strategies.	To implement a strategy to ensure acceptable industrial noise levels in North-East Rockingham residential area.	Department of Environment and Conservation; City of Rockingham Health Services.	Ongoing.	No complaints received from East Rockingham area in the past 18 months.	No complaints received by DEC in past 3 years.	Nil.
Establish a noise monitoring station in North-East Rockingham.	To establish noise monitoring at North-east Rockingham.	City of Rockingham - Health Services.	Ongoing	Nickel West have a static monitoring station and Council Noise Officers and Kwinana Industry Council (KIC) have undertaken joint monitoring to compare data from KIC's Cumulative Noise Study.	Monitoring is still ongoing and results provided to CoR by KIC. No issues flagged through monitoring.	Nil
Continue to ensure that noise impacts are addressed as part of major development in the Kwinana Industrial Area.	To reduce noise impacts resulting from new industry development in Kwinana Industrial Area	Strategic Planning and Environment	Ongoing	The City is a member of the Noise Monitoring Group chaired by DoIR, which meets regularly to consider noise issues and receives feedback from industry, community and Government	The City is a member of the Noise Monitoring Group chaired by DoIR, which meets regularly to consider noise issues and receives feedback from industry, community and Government	Continue with membership to DoIR.
Investigate a new indicator relating to the amount of households subject to noise accedence of assigned noise levels.	To determine the number of households that are subject to accedence of assigned noise levels.	City of Rockingham - Health Services.	High	New Indicator in 2009	Respond to residential noise complaints within 5 working days.	Statistics for this indicator will be provided form June 2009.