Agenda **Sustainability Advisory Committee**

A MEETING WILL BE HELD IN

CONFERENCE ROOM 2

JOONDALUP CIVIC CENTRE
BOAS AVENUE, JOONDALUP

ON

THURSDAY, 23 OCTOBER 2008

COMMENCING AT

6.00 pm

Note:

Clause 77 of the City's Standing Orders Local Law 2005 states:

"Unless otherwise provided in this local law, the provisions of this local law shall apply to meetings of committees with the exception of:

(a) clause 29 (Members seating;) and

(b) clause 54 (Limitation on members speaking.)"

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IAN COWIE
Acting Chief Executive Officer
10 October 2008

CITY OF JOONDALUP

Notice is hereby given that a meeting of the **SUSTAINABILITY ADVISORY COMMITTEE** will be held in Conference Room 2, Joondalup Civic Centre, Boas Avenue, Joondalup on **THURSDAY, 23 OCTOBER 2008** commencing at **6.00 pm.**

IAN COWIE
Acting Chief Executive Officer
10 October 2008

Joondalup
Western Australia

AGENDA

Committee Members (12)

Cr Brian Corr	Presiding Person
Cr Mike Norman	Deputy Presiding Person
Cr Albert Jacob, JP	
Cr Russ Fishwick	
Mr Steve Magyar	Community Representative
Mr Rainer Repke	Community Representative
Mr Alan Green	Community Representative
Mr Brett Dorney	Community Representative
Mr John Chester	Community Representative
Ms Janina Pezzarini	Community Representative
Mr Peter Jacoby	Community Representative
Ms Ute Goeft	Community Representative

Quorum for meetings (6)

The quorum for a meeting is to be at least 50% of the number of offices (whether vacant or not) of members of the committee.

Simple majority:

A simple majority is to be more than 50% of those members present at the meeting.

Absolute majority: (7)

An absolute majority is to be more than 50% of the number of offices (whether vacant or not) of the committee.

Casting vote:

In the event that the vote on a motion is tied, the presiding person must cast a second vote.

Terms of Reference

- *To recommend to the City of Joondalup Council on policy, advice and appropriate courses of action that promote sustainability, which is (1) environmentally responsible, (2) socially sound and (3) economically viable*

- *To provide advice to Council on items referred to the Committee from the City of Joondalup administration*

DECLARATION OF OPENING

APOLOGIES/LEAVE OF ABSENCE

CONFIRMATION OF MINUTES

MINUTES OF THE SUSTAINABILITY ADVISORY COMMITTEE HELD 21 AUGUST 2008

RECOMMENDATION

That the minutes of the meeting of the Sustainability Advisory Committee held on 21 August 2008 be confirmed as a true and correct record.

ANNOUNCEMENTS BY THE PRESIDING PERSON WITHOUT DISCUSSION

DECLARATIONS OF INTEREST

IDENTIFICATION OF MATTERS FOR WHICH THE MEETING MAY SIT BEHIND CLOSED DOORS

PETITIONS AND DEPUTATIONS

REPORTS

MOTIONS OF WHICH PREVIOUS NOTICE HAS BEEN GIVEN

REQUESTS FOR REPORTS FOR FUTURE CONSIDERATION

CLOSURE

ITEM 1 RESIGNATION FROM THE SUSTAINABILITY ADVISORY COMMITTEE - [00906]

WARD: All

RESPONSIBLE DIRECTOR: Mr Ian Cowie
Governance and Strategy

PURPOSE/ EXECUTIVE SUMMARY

To advise of a resignation of a member of the Sustainability Advisory Committee (SAC).

BACKGROUND

Council at its meeting on 20 November 2007 established the SAC with the following Terms of Reference.

1. To recommend to the City of Joondalup Council on policy, advice and appropriate courses of action which promote sustainability, which is (1) environmentally responsible, (2) socially sound and (3) economically viable.

2. To provide advice to Council on items referred to the committee.

Membership:

The Committee will consist of the following members, to be determined by the Council:

- Four (4) Elected Members
- Eight (8) Community Representatives

Quorum: 6

DETAILS

A resignation from the Committee has been received from Mrs Janina Pezzarini.

With the resignation of Mrs Pezzarini, the Committee membership will now contain one vacant position as follows:

1. Cr Brian Corr, Presiding Person
2. Cr Mike Norman, Deputy Presiding Person
3. Cr Russ Fishwick
4. Cr Albert Jacob, JP
5. Mr Steve Magyar
6. Mr Brett Dorney, Community Representative
7. Mr Rainer Repke, Community Representative
8. Mr John Chester, Community Representative
9. Ms Ute Goeft, Community Representative
10. Mr Peter Jacoby, Community Representative
11. Mr Alan Green, Community Representative
12. Vacant

Issues and options considered:

The SAC has the following options for addressing the resignation and the vacant position. These are:

1. Recommend that Council advertise the vacancy to the broad community for 30 days.

2. Recommend to Council individuals who can be approached to become members.

3. Request Council to reduce the number of representatives on the SAC from 12 to 11.

Link to Strategic Plan:

Not Applicable.

Legislation – Statutory Provisions:

The Local Government Act 1995 includes provisions in relation to the membership of committees and quorums.

Risk Management Considerations:

Not Applicable.

Financial/Budget Implications:

Not Applicable.

Policy Implications:

Not Applicable.

Regional Significance:

Not Applicable.

Sustainability Implications:

Not Applicable.

Consultation:

Nil.

COMMENT

It is recommended that the resignation be accepted and that the membership be reduced from 12 to 11.

ATTACHMENTS

Nil.

VOTING REQUIREMENTS

Simple Majority

RECOMMENDATION

That the Sustainability Advisory Committee RECOMMENDS that Council:

1 ACCEPTS the resignation of Ms Janina Pezzarini;

2 REDUCES the membership of the Committee from 12 to 11 members.

ITEM 2 FLOODLIGHTING AT SPORTS VENUES – [61618]

WARD: All

RESPONSIBLE DIRECTOR: Mr Ian Cowie
Governance and Strategy

PURPOSE/ EXECUTIVE SUMMARY

The purpose of this report is to provide an overview in relation to the management of floodlighting in City of Joondalup parks and sporting facilities.

BACKGROUND

At the Sustainability Advisory Committee Meeting on 19 June 2008, a request was made for a report on how the City's floodlighting on its parks and sporting facilities is currently managed.

Council at its meeting held on 5 August 2008 (CJ149-08/08 refers) resolved inter alia to:

> *"REQUEST a report be presented to Council on how floodlighting is managed at the City's parks and sporting facilities"*

DETAILS

At its meeting held on 2 September 2008, Council was presented with the report CJ175-09/08 Floodlighting at Sports Venues and resolved to:

1 *NOTE the information on floodlighting contained in Report CJ175-09/08 and in particular, that:*

- *floodlights are switched on in response to booking requests;*
- *floodlights are switched off 30 minutes after training times conclude;*
- *clubs contribute to the cost of floodlighting through their hire fees;*

2 *NOTE that the Clubs in Focus program will continue to educate club officials about the need for, and benefit of, reducing floodlighting times and energy consumption at sporting facilities;*

3 *REFER Report CJ175-09/08 to the Sustainability Advisory Committee for its information and advice.*

This report relates specifically to part 3 of Council's resolution.

ATTACHMENTS

Attachment 1 CJ175-09/08 Floodlighting at Sports Venues

VOTING REQUIREMENTS

Simple Majority.

RECOMMENDATION

That the Sustainability Advisory Committee SUPPORTS the decisions made by Council namely;

1 NOTES the information on floodlighting contained in Report CJ175-09/08 forming Attachment 1 to this Report and in particular, that:

- **floodlights are switched on in response to booking requests;**
- **floodlights are switched off 30 minutes after training times conclude;**
- **clubs contribute to the cost of floodlighting through their hire fees;**

2 NOTES that the Clubs in Focus program will continue to educate club officials about the need for, and benefit of, reducing floodlighting times and energy consumption at sporting facilities.

Appendix 1 refers

ITEM 3 TIMING OF STREETLIGHTING OPERATIONS WITHIN THE CITY OF JOONDALUP – [59091]

WARD: All

RESPONSIBLE DIRECTOR: Mr Ian Cowie
Governance and Strategy

PURPOSE/ EXECUTIVE SUMMARY

The purpose of this report is to provide an overview in relation to the feasibility of turning street lighting off during the night to decrease the amount of energy used and greenhouse gas emitted.

BACKGROUND

At the Sustainability Advisory Committee meeting held on 19 June 2008 a report was presented on Energy Efficient Street Lighting. As a result a motion was passed requesting Council to:

(1) Work through the West Australian Local Government Association to improve Western Power's level of service for street lighting provided to local governments;

(2) Seek the support of local State Parliamentarians to assist local governments to reduce the burden on ratepayers and avoidable greenhouse gas emissions caused by Western Power's use of outdated street lighting technology;

(3) In light of the need to reduce greenhouse gas emissions, consider the length of time that street lighting is used within the City.

Council at its meeting held on 5 August 2008 considered the report *"Energy Efficient Street Lighting Recommendations from the Sustainability Advisory Committee (CJ152-08/08 refers)* and resolved to:

1 NOTE that the current type of street lighting provided by Western Power to the City of Joondalup is outdated which burdens ratepayers with extra operating costs and avoidable greenhouse gas emissions;

2 WRITE to the Western Australian Local Government Association in support of energy efficient street lighting again;

3 WRITE to local State Parliamentarians in relation to Western Power's use of outdated street lighting technology and seeking their support for newer energy efficient technologies;

4 SEEK a report on the advantages and disadvantages of reducing the time for which street lighting operates within the City.

DETAILS

At its meeting held on 30 September 2008 Council was presented with the report CJ197-09/08 Timing of Street Lighting Operations within the City of Joondalup and resolved to:

"*REFER this report to the Sustainability Advisory Committee for its information and advice".*

ATTACHMENTS

Attachment 1 CJ197-09/08 Timing of Street Lighting Operations within the City of Joondalup

VOTING REQUIREMENTS

Simple Majority.

RECOMMENDATION

That the Sustainability Advisory Committee RECEIVES Report CJ197-09/08 - Timing of Street Lighting Operations within the City of Joondalup forming Attachment 1 to this Report and provides advice to Council on its subject matter.

Appendix 2 refers

ITEM 4 STORMWATER OUTFALLS AND SEPTIC TANKS WITHIN THE CITY OF JOONDALUP – [34958]

WARD: All

RESPONSIBLE DIRECTOR: Mr Ian Cowie
Governance and Strategy

PURPOSE/ EXECUTIVE SUMMARY

The purpose of this report is to provide an overview in relation to stormwater outfalls and septic tank outputs along the coastal strip of the City and adjacent to Yellagonga Regional Park.

BACKGROUND

At the Sustainability Advisory Committee (SAC) meeting held on 17 April 2008 it was requested that a report be provided on "*the City's current initiatives and progress in relation to stormwater quality and stormwater outfalls along the City of Joondalup coastline*".

A report on this matter was presented to the SAC at its meeting held on 19 June 2008 and the Committee resolved as follows:

> *"REFER the item back to its next meeting subject to the provision of further information concerning the Sorrento Beach project."*

Council at its meeting held on 5 August 2008 *(CJ149-08/08 refers)* resolved inter alia to:

> *"REQUEST a report be presented to Council in relation to stormwater outfalls and septic tank outputs along the coastal strip of the City and adjacent to Yellagonga Regional Park"*

DETAILS

At its meeting held on 2 September 2008 Council was presented with the Report CJ177-09/08 Stormwater Outfalls and Septic Tanks and resolved to:

1 NOTE:

- *(a) the progress that has occurred with addressing stormwater outfalls in the Yellagonga Regional Park;*
- *(b) the progress that has occurred with addressing stormwater outfalls along the coast;*
- *(c) the significant costs associated with upgrading stormwater outfalls and converting septic tanks to deep sewage;*
- *(d) that the quality of water in the City's coastal areas according to Health Department testing is not being adversely affected by Septic Tanks;*
- *(e) that the Water Corporation has completed its sewage infill program in the coastal areas of Joondalup;*

2 REQUEST that the City again write to the Water Corporation to encourage them to progress the Infill Sewage Program in Kingsley;

3 REQUEST that the City examines the cost of connecting the septic tanks at the surf life saving clubs and other smaller installations along the coast, and determine if there are potentially any grants available that could largely cover the associated costs;

4 SEEK external funding opportunities to address all storm water outfalls and septic tanks identified within the City's plans;

5 REFER Report CJ177-09/08 to the Sustainability Advisory Committee for its information and advice;

6 SEEK advice from the Swan Catchment Council on its future plans in relation to stormwater outfalls and septic tanks.

This report specifically addresses part 5 of the resolution.

ATTACHMENTS

Attachment 1 CJ177-09/08 - Stormwater Outfalls and Septic Tanks

VOTING REQUIREMENTS

Simple Majority.

RECOMMENDATION

That the Sustainability Advisory Committee:

1 NOTES Report CJ177-09/08 Stormwater Outfalls and Septic Tanks forming Attachment 1 to this Report;

2 NOTES the decisions made by Council namely;

(a) NOTES:

(i) the progress that has occurred with addressing stormwater outfalls in the Yellagonga Regional Park;

(ii) the progress that has occurred with addressing stormwater outfalls along the coast;

(iii) the significant costs associated with upgrading stormwater outfalls and converting septic tanks to deep sewage;

(iv) the quality of water in the City's coastal areas according to the Department of Health's testing is not being adversely affected by septic tanks;

(v) the Water Corporation has completed its sewage infill program in the coastal areas of Joondalup;

(b) NOTES that the City is writing again to the Water Corporation to encourage it to progress the Infill Sewage Program in Kingsley;

(c) NOTES that the City is examining the cost of connecting the septic tanks at the surf life saving clubs and other smaller installations along the coast, and determining if there are potentially any grants available that could largely cover the associated costs;

(d) NOTES that the City is seeking external funding opportunities to address all storm water outfalls and septic tanks identified within the City's plans;

(e) NOTES that the City is seeking advice from the Swan Catchment Council on its future plans in relation to stormwater outfalls and septic tanks.

Appendix 3 refers

ITEM 5 SUSTAINABILITY ADVISORY COMMITTEE – WORKSHOP – 23 OCTOBER 2008 – [00906]

WARD: All

RESPONSIBLE DIRECTOR: Mr Ian Cowie
Governance and Strategy

PURPOSE

To advise the Sustainability Advisory Committee on the appropriate process for holding a workshop.

BACKGROUND

It was resolved at a meeting of the Sustainability Advisory Committee (SAC) held on 21 August 2008 that the SAC hold a Workshop at its next meeting on 23 October 2008 to consider a number of key sustainability related documents for the purpose of examining relevance of those reports to the City of Joondalup.

Documents requested for the workshop include:

1 the Sustainable Cities August 2005 Report and the Sustainability Charter from the Commonwealth of Australia's House of Representatives Standing Committee on Environment and Heritage;

2 the Endangered State of Australian Cities: Climate Threat and Urban Response Report (Source: Urban Research Program, Griffith University);

3 the Unsettling Suburbia: The New Landscape of Oil and Mortgage Vulnerability in Australian Cities Report (Source: Urban Research Program Research Paper No. 17 Griffith University);

4 the Peak Oil Action Plan and Peak Oil Policy – Maribyrnong City Council, Melbourne Victoria

It should be noted that copies of Items 2 and 3 were provided to Committee members with the Minutes of the SAC meeting held on 21 August 2008. Items 1 and 4 can be viewed or downloaded via the following weblinks as provided previously:

http://www.aph.gov.au/house/committee/environ/cities/report.htm
http://www.aph.gov.au/house/committee/environ/charter/tor.htm
http://www.maribyrnong.vic.gov.au/Page/page.asp?Page_Id=3395&h=1

Conducting of Workshop

The options available to the Committee are to either close the meeting and conduct the workshop or adjourn the meeting. Should the Committee wish to adjourn the meeting the following information is provided.

Clause 63 of the Standing Orders Local Law 2005 states:

"***63. The meeting do now adjourn – effect of motion***

(1) If a motion "that the meeting do now adjourn", is carried then the meeting is to stand adjourned to a time and date specified in the motion, or where no time and date is specified, to such time and date as the presiding person shall declare."

To assist, the following motions are provided:

Motion to adjourn meeting

That the Sustainability Advisory Committee meeting do now adjourn *(specified time can be given)*.

Workshop is then conducted.

Motion to resume meeting

That the Sustainability Advisory Committee meeting be resumed.

APPENDICES FOR AGENDA OF SUSTAINABILITY ADVISORY COMMITTEE

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APPENDIX 1

Attachment 1

CJ175-09/08 **FLOODLIGHTING AT SPORTS VENUES - [61618]**

WARD: All

RESPONSIBLE DIRECTOR: Mr Ian Cowie
Governance and Strategy

PURPOSE/EXECUTIVE SUMMARY

To outline for the Council how the City's floodlighting on its parks and sporting facilities is currently managed.

The report highlights that floodlights are switched on in response to booking requests. Consequently, there are no standard times for floodlighting which apply across all parks. The report also notes that the lights currently remain on for actual training times plus a 30 minute buffer to allow for the users to pack up. Because of the centralised system which controls the floodlights, should users pack up in under 30 minutes or finish training early, the lights will remain on until the programmed time concludes. Further, the report notes that clubs using floodlit playing surfaces contribute to the cost of floodlighting through their hire fees.

BACKGROUND

At the Sustainability Advisory Committee Meeting on 19 June 2008, a request was made for a report on how the City's floodlighting on its parks and sporting facilities is currently managed.

Council at its meeting held on the 5 August 2008 *(CJ149-08/08 refers)* considered a report "*The Minutes of the Sustainability Advisory Committee held on 19 June 2008"* and resolved inter alia to:

> *"REQUEST a report be presented to Council on how floodlighting is managed at the City's parks and sporting facilities."*

DETAILS

Provision of floodlighting

Floodlighting on reserves, parks and recreation grounds is provided for under City Policy 6.1 Reserves, Parks and Recreation Grounds which states that:

> *"The City will install and maintain, at its cost, 2 lighting standards each fitted with up to two floodlights of approximately 1,000w capacity per luminary per cricket or football oval.*
>
> *Any additional lighting will be the installation and ongoing responsibility of the sports association seeking lights. Installation of additional lights may only be undertaken following receipt of the relevant Director's written consent and approval of the lighting design and provision of planning consent as required. The City supports clubs lighting reserves to a training standard. All projects must meet Australian Standards for lighting."*

Additionally, individual clubs may request permission to floodlight a reserve themselves. Clubs may decide to self fund such an undertaking or apply for funding through the Community

Sporting Recreation Facilities Fund (CSRFF) coordinated by the Department of Sport and Recreation (DSR). The CSRFF is an annual funding program that, in partnership with local governments, provides financial assistance to sporting and recreation organisations for the development of basic sporting infrastructure. Projects are funded on a shared basis, with one-third contributions being made by DSR, the City of Joondalup, and the applicant organisation.

The application process for CSRFF requires that clubs work with their local governments to complete community consultation processes and to conduct needs and feasibility assessments. All projects require approval by Council and must comply with the City's and the State's building and planning codes, and must meet Australian Standards for lighting.

CSRFF applications are required to demonstrate that design considerations have been made to incorporate environmental issues such as energy and water efficiency. This aspect of funding will become more prevalent in future rounds.

In the event that a club's submission is successful and a CSRFF grant becomes available, the City will budget for its share of the funding contribution and works can then be undertaken by the club.

Floodlighting on tennis courts is provided for under City Policy 6.4 Tennis Court Lighting Standards, which identifies that lighting is to be provided for new courts when built and illuminated to a [Tennis] Association Standard or a Recreational Standard.

Management of Floodlighting

After installation, floodlighting becomes an asset of the City and the City is responsible for all maintenance, including the cost of electricity. Currently, the floodlighting component of power bills is not identified, so the actual 'costs' of this provision are unknown at present. However, leases and fees for hire include broad consideration of power costs.

At the start of each sporting season, clubs submit bookings for floodlighting time slots. These bookings are processed by the City and the lights are switched on and off in accordance with these bookings. The City uses a central control system for programming the floodlights and does not have the resource capacity to monitor if users are actually in attendance in their timeslot or if they have left prior to the end of the scheduled booking timeframe. It is in these instances that the public may see ovals with floodlights on and no one is using the oval.

In response to the current State energy crisis, the City recently reviewed the lighting of all parks and reserves used by clubs. From July, timing for floodlighting has been adjusted and is now restricted to actual training times, with a 30 minute buffer to allow for pack up.

The City plans to evaluate the impact of the restricted lighting times with clubs once power supply within the State returns to normal. This evaluation will determine whether clubs can operate using floodlighting on a more limited basis.

Link to Strategic Plan:

Key Focus Area:	Community Wellbeing
Objective 5.1	To ensure the City's facilities and services are of a high quality and accessible to everyone

Legislation – Statutory Provisions:

Not Applicable.

Risk Management considerations:

There would be risks associated with floodlighting being turned off too early and not allowing sporting groups adequate time to pack up.

Financial/Budget Implications:

While the City pays the energy cost associated with floodlighting directly, clubs using the floodlights contribute to these costs through their hire fees.

Policy Implications:

Not Applicable.

Regional Significance:

Not Applicable.

Sustainability Implications:

The provision of floodlighting to sports grounds contributes to the pursuit of healthy lifestyles through active and passive recreation and reduces the likelihood of anti-social behaviour such as vandalism or the destruction of sports venues. In this way, it can be said to contribute to social sustainability in our communities.

On the other hand, extended or unlimited use of floodlighting with the resultant generation of greenhouse gas emissions, when ovals are not being used is not a sustainable practice, even where the costs of such a provision are, in part, borne by the clubs.

Consultation:

Not Applicable.

COMMENT

Floodlighting is considered valuable community infrastructure to assist people recreate and for the City to maximise the use of its ovals and sporting grounds. The State's current energy crisis has led to the situation where the City has liaised with sporting groups using floodlighting and reduced the lighting times to actual training times plus 30 minutes pack up. This impact will be evaluated with the clubs when the gas supply crisis is over to determine an appropriate lighting regime for the future.

Further, the City's recently launched Clubs in Focus program holds seasonal booking workshops with all clubs where the issue of floodlighting is addressed.

ATTACHMENTS

Nil.

VOTING REQUIREMENTS

Simple Majority

RECOMMENDATION

That Council:

1 **NOTES the information on floodlighting contained in Report CJ175-09/08 and, in particular, that:**
- **floodlights are switched on in response to booking requests;**
- **floodlights are switched off 30 minutes after training times conclude;**
- **clubs contribute to the cost of floodlighting through their hire fees;**
-

2 **NOTES that the Clubs in Focus program will continue to educate club officials about the need for, and benefit of, reducing floodlighting times and energy consumption at sporting facilities;**

3 **REFERS Report CJ175-09/08 to the Sustainability Advisory Committee for its information and advice.**

APPENDIX 5 - 2 - 3

Attachment 1

CJ197-09/08 **TIMING OF STREETLIGHTING OPERATIONS WITHIN THE CITY OF JOONDALUP - [59091]**

WARD: All

RESPONSIBLE DIRECTOR: Mr Ian Cowie
Governance and Strategy

PURPOSE/ EXECUTIVE SUMMARY

The purpose of this report is to provide an overview of the feasibility of turning off streetlights at certain times during the night to decrease the amount of energy used and greenhouse gases emitted.

BACKGROUND

At the Sustainability Advisory Committee meeting held on 19 June 2008 a report was presented on Energy Efficient Street Lighting. As a result a motion was passed requesting Council to:

"(1) Work through the West Australian Local Government Association to improve Western Power's level of service for street lighting provided to local governments.

(2) Seek the support of local State Parliamentarians to assist local governments to reduce the burden on ratepayers and avoidable greenhouse gas emissions caused by Western Power's use of outdated street lighting technology.

(3) In light of the need to reduce greenhouse gas emissions, consider the length of time that street lighting is used within the City."

Council at its meeting on 5 August 2008 considered the report *"Energy Efficient Street Lighting Recommendations from the Sustainability Advisory Committee (CJ152-08/08 refers)* and resolved to:

"1 NOTE that the current type of street lighting provided by Western Power to the City of Joondalup is outdated which burdens ratepayers with extra operating costs and avoidable greenhouse gas emissions;

2 WRITE to the Western Australian Local Government Association in support of energy efficient street lighting again;

3 WRITE to local State Parliamentarians in relation to Western Power's use of outdated street lighting technology and seeking their support for newer energy efficient technologies;

4 SEEK a report on the advantages and disadvantages of reducing the time for which street lighting operates within the City."

This report addresses item 4 of Council's request.

DETAILS

In most areas of Australia, "all night" lighting is now the norm, but this was not always the case. In Western Australia all street lighting used to be switched on at dusk and switched off at midnight or 1.15 am. During the 1980's Western Power advised local government that it had surplus energy during night time hours that corresponded with the midnight to dawn switch off period. It made an offer to all local governments to supply very cheap power to enable streetlights to be left on all night. As cost was the major driver for local governments in those days the agreements were made to keep street lighting on. This situation commenced in Joondalup 1995 and is still in place today. Safety and security were of a lesser concern than it is today.

It should be noted that Western Power generation stations can only generate power where there is demand. The cost of shutting down power stations and turning them back on is extremely cost prohibitive and takes significant time to do so.

Given these constraints Western Power is not able to restart their power stations on a daily basis and hence why they look for demand situations 24 hours a day to generate power in order to efficiently operate their power stations. Thus Western Power has justifiable reasons for needing to generate power at base loads. It should be noted that the City has control over its circuitry in areas where decorative street lighting has been installed such as in Iluka and the City Centre.

With respect to general streetlighting across Joondalup it should be noted that most Western Power lighting circuits are energised 24 hours a day – that is, all the lights have energy constantly supplied to them and the lights are switched off/on by the photo-electric (PE) cell on the top of the light fitting. PE cells are used to switch the light on and off by sensing the ambient light level. A PE cell is calibrated to turn lights on once the illumination level drops below a certain level (i.e. sunset) and to switch off when light levels increase above a certain level (i.e. sunrise).

Switching lights off during certain parts of the night is a lighting management strategy that can significantly reduce the amount of energy public lighting consumes. However, most of Western Power's current street lighting infrastructure is not able to facilitate this and hence it is not currently possible to turn lights off. With respect to new poles, the same issue would prevail unless Western Power reconsidered and changed its light management strategy.

To upgrade the infrastructure so that lights can be turned on or off at different times will require re-wiring of the streetlight network to get a control circuit installed in that area. In order to be really reliable, the PE cell on the top of each lamp will need to be removed and replaced with a master PE cell or time clock for each circuit.

While Western Power has indicated that it is possible to upgrade the lighting infrastructure in this way they have also said that it would be highly expensive. It is impossible for the City to estimate the cost of these upgrades. To obtain a true idea of cost the City would need to request a specific costing from Western Power. It is highly unlikely that Western Power would be willing to cover all or part of the cost of any change.

Issues and Options

The advantages and disadvantages of reducing street lighting is summarises as follows:

Advantages

The advantages associated with reducing street lighting include environmental and economic benefits. These are:

- A reduction of greenhouse gas entering the atmosphere;
- A reduction of cost for the City in relation to its street lighting bill.

Last year the City spent over $1.5 million on its StreetVision contract with Western power as follows:

Lamp Types	Number	Cost Per Day	Total Cost Per Day	Total Cost Per Year
80 w Mercury Vapour	7765	0.2412	1872.918	$ 683,615.07
80 w Mercury Vapour	46	0.386	17.756	$ 6,480.94
125w Mercury Vapour	3280	0.313	1026.64	$ 374,723.60
125w Mercury Vapour	11	0.456	5.016	$ 1,830.84
250w Mercury Vapour	126	0.4854	61.1604	$ 22,323.55
400wMercury Vapour	2	0.651	1.302	$ 475.23
150w High Pressure Sodium	336	0.3514	118.0704	$ 43,095.70
250w High Pressure Sodium	2389	0.4526	1081.2614	$ 394,660.41
Totals	13955			$ 1,527,205.33

Disadvantages

As outlined in the Detail section of this report the disadvantages with turning street lighting off include:

- The lack of ownership of the infrastructure by the City of Joondalup and the inherent issues associated with Western Power being the authority that makes the ultimate decisions on this matter;
- The significant costs associated with upgrading the infrastructure so that it can be turned off;
- The potential social issues that may arise and the risk of community concern relating to safety during the night if street lighting is not on.

Link to Strategic Plan:

Key Focus Area Natural Environment

Objective 2.1: To ensure that the City's natural environmental assets are preserved, rehabilitated and maintained.

Strategy 2.1.5: The City reduces its greenhouse gas emissions and assists the public to reduce community emissions.

Legislation – Statutory Provisions:

Not Applicable.

Risk Management considerations:

Changing the hours of street lighting could have an impact on public safety and security.

Financial/Budget Implications:

To turn off street lights within the City Centre the cost will depend on the complexity of the circuitry in each cabinet and how the circuitry is laid out on the ground. It is estimated that it would cost around $1,500 for each switchboard (the City Centre would require 11) and $450 per pole for a time clock to be installed (the City Centre has 1,600 poles). The $450 amount may be reduced significantly if 1,600 time clocks were purchased. However, this is speculative and it is conservative to assume that the total cost for converting the City Centre's street lighting would be around $700,000 because the City has control over the ornamental lighting system.

With regard to the 95% of streetlights outside the City Centre, the City would need to get costings from Western Power because the City does not have knowledge of how many overhead poles and underground connections there are. The City knows that there are approximately 14,000 Western Power owed luminaires and the cost to retrofit all these would be substantial.

Policy Implications:

Not Applicable.

Regional Significance:

Not Applicable.

Sustainability Implications:

Improvements in the energy efficiency of street lighting will achieve significant reductions in greenhouse gas emissions. However, any decision to attempt to change the current status quo needs to be balanced with the cost of the change and the ability of the City to deliver it.

Consultation:

Not Applicable.

COMMENT

Unfortunately the switching off of street lights at certain times of the night does not offer a simple short term solution for reducing the energy consumption of street lighting as identified earlier in this report.

This issue is part of the wider problem of an outdated street lighting system that is unable to adapt and meet new demands and challenges. It is Western Power's responsibility to start meeting these new challenges. The City should continue to lobby State Government, through Western Australian Local Government Association, to provide a better designed and maintained and more efficient street lighting system.

ATTACHMENTS

Nil.

VOTING REQUIREMENTS

Simple Majority

COUNCIL DECISION

Council REFERS this report to the Sustainability Advisory Committee for its information and advice.

10APPENDIX Attachment 1

- 3 - -

CJ177-09/08 **STORMWATER OUTFALLS AND SEPTIC TANKS - [34958]**

WARD: All

RESPONSIBLE DIRECTOR: Mr Ian Cowie
Governance and Strategy

PURPOSE/ EXECUTIVE SUMMARY

The purpose of this report is to provide an overview in relation to stormwater outfalls and septic tank outputs along the coastal strip of the City and adjacent to Yellagonga Regional Park.

BACKGROUND

At the Sustainability Advisory Committee meeting held on 17 April 2008 it was requested that a report be provided on "*the City's current initiatives and progress in relation to stormwater quality and stormwater outfalls along the City of Joondalup coastline*".

A report on this matter was presented to the Sustainability Advisory Committee at its meeting on 19 June 2008 and the Committee resolved to:

> *"REFER the item back to its next meeting subject to the provision of further information concerning the Sorrento Beach project."*

Council at its meeting held on the 5 August 2008 *(CJ149-08/08 refers)* considered the report "*The Minutes of the Sustainability Advisory Committee held on 19 June 2008*" and resolved inter alia to:

> *"REQUEST a report be presented to Council in relation to stormwater outfalls and septic tank outputs along the coastal strip of the City and adjacent to Yellagonga Regional Park."*

DETAILS

Yellagonga Regional Park Stormwater Outfalls

The Yellagonga Regional Park comprises 1400 hectares of rare wetlands, which include Lake Joondalup, and Lake Goollelal. This wetland is one of the largest surface expression for the Gnangara Mound which is an important source of water for the Perth metropolitan area ground water scheme.

Residential development is now the primary land use adjoining the wetlands and a significant factor in:

- Changes in peak stormwater flow characteristics.
- Increase in stormwater runoff volumes.
- Deteriorations in quality of stormwater runoff.
- Changes in hydrological amenity.

Impact upon the wetlands includes significant amounts of particulate matter and pollutants entering the wetlands, with inherent impacts of increased nutrient loading, algal blooms, gross pollutant problems and increased midge and mosquito populations.

Within the Park there are 32 outfalls and sumps, and of those, the City of Joondalup has full or part responsibility for 14. (Attachment 1 refers) Of the 14, seven Outfalls, namely 18, 19, 20, 21, 22, 24, and 25 have been recently upgraded. These works have now addressed all the outfalls that had a direct discharge into Lake Goollelal. It should be noted that the remaining stormwater catchment points are sumps which do not directly discharge into the lake system.

The stormwater upgrade projects that the City has undertaken to date provide stormwater treatment systems for all outfalls directly discharging into Lake Goollelal.

These upgrades included:

- The catchment being divided into discrete sub areas with their own treatment systems so that water is infiltrated into the aquifer close to the source;
- The use of landscaped infiltration basins and retention swales to maximise upstream infiltration, reduce peak flows, and reduce the amount of nutrients and other contaminants entering the lake;
- The use of gross pollutant traps to capture gross pollutants and to a lesser extent reduce the amount of nutrients and other contaminants entering the wetlands;
- The discontinuation of large pipe networks directly discharging into the wetlands and replacing smaller systems with localised multiple outfall drainage facilities away from the wetlands

This program of works was first piloted at Outfall 21 in 2003/04 and was a success for addressing stormwater management. Outfall number 21, located on the southern extremes of Lake Goollelal near the arterial road of Hepburn Avenue was selected as the trial site for this new strategy. The catchment area for Outfall 21 is approximately 38 hectares with a mixture of land uses of natural bushland, parks and reserves, commercial uses, a petrol station and residential developments.

The possible sources of pollutants into this catchment included soil erosion, fertilisers, human and animal waste, vehicle fuels and fluids, commercial and household paints, chemicals, detergents, pesticides and gross pollutants.

The stormwater drainage network for this catchment is a convectional piped network incorporating grated catchpits and side entry pits with stormwater runoff into Lake Goollelal via a 900mm reinforced concrete pipe connected to a large grated bubble up pit. This outfall was subject to submersion during the winter months.

The treatment of this outfall that was implemented was grouped into three categories:

- Primary treatment: Physical screening or rapid sedimentation methods to contain contaminants, such as gross pollutants and course sediment
- Secondary treatments: Finer particle sedimentation and filtration techniques to contain fine particles and attached pollutants
- Tertiary treatments: Enhanced sedimentation and filtration, biological uptake and absorption onto sediments to retain nutrients and heavy metals.

During 2007/08 the City committed funding for the upgrade of the remaining 6 outfalls discharging into Lake Goollelal. This work which was completed in August 2008 was expedited due to the successful funding application for a Federal Community Water Grant. The grant of $218,000 was used to bring forward planned works from the 2008/09 Capital Works Program into 2007/08. On completion of the Lake Goollelal stormwater improvements, the City's focus will shift to its coastal outfalls.

Coastal Stormwater Outfalls

In April 2007 the Department of Water (DOW) released the report *"Contaminants in Stormwater Discharge, and Associated Sediments, at Perth's Marine Beaches"*. This report detailed findings of a baseline study of the types and concentrations of contaminants in and around 65 stormwater drains in the Swan Region. The drains were located within the Cities of Wanneroo, Joondalup, Stirling and Rockingham and the Towns of Cambridge and Cottesloe. The Study found that, depending on the region, site and rainfall event, concentrations can exceed recreational as well as environmental guidelines.

While the DOW report provides a good starting point it does not provide a complete picture. Not all of the City of Joondalup outfalls were tested and of the five outfalls that were tested a total of just 22 samples were taken over two winters (between 3-5 samples per site). The concentration of these contaminants is likely to vary (either above or below guidelines) at different times of the year and before or after certain rain events.

Overall, the DOW report found that the concentrations of stormwater contaminants in the City of Joondalup were comparatively low compared with other areas to the south. The following table provides details of each of the Joondalup sites, the number of samples taken and highlights for each site any tests where the average concentration of contaminants exceeded the guidelines.

It is particularly important to note that the following table shows where the average concentration of all the samples taken has exceeded the guidelines.

The DOW report did not provide individual test results so it is not possible to identify whether an abnormal reading could have influenced the average such that it exceeded the guidelines. Given that only a few samples were taken it is difficult to know if the results provide an accurate reflection of the level of contamination as this can be affected by a variety of climatic and geographical variables.

Table below – Extract from DOW Report Findings

Site	Site location	No of samples	Nutrients			Total Petroleum Hydro carbons	Metals	
			NH_4	TP	FRP		Lead	Iron
JND01a	Rocky outcrop at northern end of Burns Beach car park	3	X	X	X	X		X
JND01b	South end Burns Beach car park. Outlet opposite café	3		X				X
NST01	Beach outfall, Marmion Angling & Aquatic Club car park	4		X		X	X	
NST03	Beach outfall (south of Sorrento Beach – report did not give exact location)	4	X	X	X		X	X
NST04	Beach outfall (south of Sorrento Beach – report did not give exact location)	5		X			X	X
NST05	Beach outfall (south of Sorrento Beach – report did not give exact location)	3		X				X

The main types of contaminants in the City's stormwater drains were certain metals and nutrients. Contaminants from metals are most likely associated with car wear, engine oil and petrol which are associated with road and car park use.

With regard to nutrients, each of the sample sites was taken in areas where septic systems exist. As infill sewer has now been provided to each of these areas, this source of nutrients is likely to reduce over time. Other sources include fertiliser use in the catchment area.

It should be noted that while the above table highlights concentrations where guidelines were exceeded there were many tests in which the guidelines weren't exceeded including: bacterial concentrations (all), nutrient concentrations (Dissolved Oxidised Nitrogen, Total Kjeldahl Nitrogen, Total Nitrogen) and metal concentrations (Arsenic, Cadmium, Chronium, Manganese, Mercury, Nickel).

Participation in Metropolitan Coastal Beaches Microbial Monitoring Program

The City participates in the Metropolitan Coastal Beaches Microbial Monitoring Program run by the Department of Health. Through this program during the summer season a total of 24 samples are taken at regular intervals (every week) from 9 sites along the Joondalup coast (total of 216 samples each summer) to test for microbial activity. Half of these samples are taken by the Department of Health and half by the City's Environmental Health Officers.

This enables the City to take quick and effective action if microbial levels are found to be at a level which could be a risk to human health. To date, even within Hillarys Boat harbour, microbial levels have been found to be below recreational guidelines. The results of these tests can be seen on the Department of Health's website.
(www.healthyswimming.health.wa.gov.au/home/)

Proposed Program of Works for 2008/09

It should be noted that the City has an allocation of $200,000 for coastal stormwater upgrades in the 2008/09 budget. It is anticipated that the City will start with upgrading two outfalls at Burns Beach (these were identified in the DOW report). These outfalls have already been investigated by the City's consultant to determine what improvements can be taken to improve the quality of the water being discharged. However detailed design will still be required prior to implementing infrastructure improvements.

In addition, as part of the West Coast Drive Shared Path upgrade, the coastal outfalls along this section of the coast (Marmion and Sorrento) will be upgraded on a staged basis. As part of the project the upgrade of the outfalls will need to be prioritised and detailed investigations and designs undertaken.

This project has been in the planning stage for some time and the original concept and scope of the project was to upgrade the dual use path and associated fencing infrastructure from Beach Road Marmion to Sorrento Beach.

The concept design was approved by Council in 2006/07 and a budget was set aside of $4.2 million in that year. In 2007 when the DOW released its report on the state of coastal outfalls, the City instigated a review of the West Coast Drive Enhancement Project with a view to incorporate into the preliminary design for the project upgrades to all the coastal outfalls within the project scope. The preliminary design is now completed and includes upgrades for those outfalls. The City is currently working on the detailed design which establishes the final cost estimates for the entire project. Given that the scope of the project now includes the stormwater outfall upgrades it is likely that the detailed costing will be higher than the $4.2 million budget that has been set aside. Should this be the case then a report will be presented to Council outlining the new scope and associated costings for the project and Council will need to deliberate on any increase over and above the budgeted amount.

Future Upgrades for Coastal Outfalls

The City has 21 coastal outfalls (as shown in Attachment 2 and detailed in Attachment 3) and due to this large number and the diversity of works required in implementing practical treatments, detailed investigation and preliminary design work needs to be undertaken to find the best solution for each discharge point. The costs will also be significant and, would most likely, need to be scheduled and funded over a number of years. For example an average cost of a standard treatment involving installation of gross pollutant traps, drainage basin or underground detention systems etc. can vary from $50,000 - $100,000 per treatment. This equates to approximately $1-2 million in total for all 21 discharge points to be treated that are within the City.

External funding opportunities applicable to the coastal stormwater upgrades will continue to be assessed as they arise as this will enable the City to complete more upgrades in a shorter timeframe.

Septic Tanks within the City of Joondalup

The City of Joondalup has four isolated pockets remaining where septic tanks are still in place. These areas include:

- A section of Marmion, Sorrento and Duncraig (as shown in Attachment 4);
- A section of Mullaloo (as shown in Attachment 5);

- A section in Kingsley (From Lakeway Drive to Wanneroo Road); and
- Silkeborg Crescent in Joondalup.

Since about 2002 the Water Corporation's Infill Sewage Program has included all the coastal suburbs including Marmion, Sorrento, Duncraig and Mullaloo. This means that all of these residential areas now have the ability to connect to deep sewage; however whether or not they have done so is a matter that the Water Corporation is dealing with. It should be noted that the Water Corporation gives a period of time for people to connect once deep sewer is in the area but once that timeframe expires they will then charge properties irrespective of whether they are connected or not.

The Water Corporation is currently investigating the take up rates for connections to the infill program and will advise the City as soon as that data is available. Prior to the commencement of the Infill Program the Water Corporation wrote to the City seeking advice on the program The City's response was to request that the Water Corporation's program included Kingsley as a prior given the issues that septic tanks have on wetlands. Unfortunately this request was not acted upon.

Under the Health Act the City has powers to enforce connections to deep sewage. However, the City has taken a lenient approach with existing properties and not forced connections. However it issues conditions on all new building approvals that the property(s) be connected to sewage or requiring connection to sewer when developers or individuals decide to upgrade or subdivide.

Septic Tanks Adjacent the Yellagonga Regional Park

With respect to the Yellagonga Regional Park, the only area of residential development that remains on septic systems, and is in close vicinity to the Lake Goollelal wetlands, is a small pocket in Kingsley in the vicinity of Lakeway Drive through to Wanneroo Road. These properties are large semi rural properties with the average block size being 2000 square meters.

Environmental Impact of Septic Tanks

The impact that septic tanks are having on the water bodies both within the Yellagonga Regional Park and the coastal beaches is unknown as specific studies of this nature have not be conducted and would be very difficult to isolate. It should be noted however, that water quality in the coastal areas as a result of direct leaching from septic tanks would not pose any major heath risk to swimmers or biodiversity because the bacteria that is generated in septic tanks generally stay in the tanks and those small amounts that may leach will die or be filtered in the sand layers before they can reach water bodies. The particulates that do leach are generally nutrients which do not have a major impact on the coastal environment.

With respect to septic tanks within the vicinity of the Yellagonga Regional Park the leaching from septic tanks is likely to be more of a significant issue because nutrient loads entering the Lakes tends to cause other issues such as algae blooms.

In general it is scientifically proven that septic tanks do leach into the groundwater systems and it is strongly encouraged these days that residential areas within the metropolitan area are connected to deep sewage. This provides the rationale for the Water Corporation's Infill Sewage Program.

Septic Tanks within the Responsibility of the City of Joondalup

The City of Joondalup has responsibility for the coastal foreshore and within that area there are a number of public infrastructures such as toilets, surf clubs and community halls that still utilise septic tanks systems. These include:-

- Marmion change room and toilets
- Sorrento Surf Lifesaving Club
- Whitford Nodes toilets and change rooms
- Mullaloo Surf Lifesaving Club and change rooms
- Mullaloo North toilet
- Ocean Reef Boat Harbour (Sea Rescue and Ocean Reef Sea Sports Club)
- Iluka Foreshore toilets
- Burns Beach change rooms and Jack Kikeros Hall

It is expected that as upgrades and refurbishments occur these sites will be connected to deep sewage in the future.

It should be noted that the cost associated with retrofitting sewage to buildings currently serviced by septic tanks involves large capital costs. For example the average cost for each site would be in the vicinity of $250,000 each.

Other Coastal Septic Tanks

The Marmion Angling and Aquatic Club (MAAC) has responsibility for upgrading of that facility. It is currently planning to connect to sewage as part of the Clubs' pending upgrade program and the City will work with the MAAC in order to upgrade the City's nearby toilet and change rooms.

Link to Strategic Plan

Key Focus Area	Natural Environment
Objective 2.1	To ensure that the City's natural environmental assets are preserved, rehabilitated and maintained.
Strategy 2.1.4	The City implements improved storm water management and water quality processes.

Legislation – Statutory Provisions:

Not Applicable.

Risk Management considerations:

Not Applicable.

Financial/Budget Implications:

The upgrade of stormwater infrastructure has significant financial implications. In order to upgrade all 21 discharge points along the City's coastline it is necessary to undertake preliminary design to identify what type of treatment is best for each location. The works will vary at each point depending on a range of technical and location specific issues; however as a

general estimate each discharge point could likely be upgraded for a cost ranging somewhere between $50,000 - $100,000. It is suggested that works would need to be planned and scheduled over a number of years.

Further it should be noted that the upgrading of septic tanks that are owned or leased by the City along the coastal strip will also have similar significant costs associated with these works. For example if all the septic systems were upgraded the cost to the City would likely be in the vicinity of $2,500,000.

Policy Implications:

Not Applicable.

Regional Significance:

Not Applicable.

Sustainability Implications:

Upgrades to the coastal stormwater infrastructure will improve the quality of the stormwater and contribute to a healthier ocean environment; however the economic implications are significant.

Consultation:

The City has consulted with the Water Corporation in compiling this report.

COMMENT

The City is aware of the environmental and health issues associated with stormwater quality and has been and will continue to work actively to improve stormwater infrastructure across the City as part of the Capital Works budget and as key actions within its Environmental Plan and Water Action Plan dictate.

A Case Study - Town of Cottesloe – Groundwater Restoration Program

It is interesting to note that the Town of Cottesloe has entered into a 4 year partnership with the Federal Government to restore groundwater resources. The Project will entail the replacement of open sumps with underground retention systems, 400 new soakage pits which will trap and filter stormwater and replenish groundwater into the aquifer with treated stormwater and will enable 10 stormwater ocean outfalls to be closed along the coast. Another major part of the project is a community education campaign called THINK Water which aims to:

- Reduce private groundwater use;
- Decrease the installation of new private bores;
- Reduce stormwater pollutants;
- Enhance community awareness and encourage positive behaviour change regarding water resources.

The overall cost of these initiatives will be in excess of $200,000 over three years with matching contributions made from the Federal Government, State Government and the Town of Cottesloe.

The project provides a good example of a strategic model that has been taken toward water management, protecting groundwater resources and ocean discharges. The City of Joondalup has also taken a strategic approach to water management through its Environment Plan and associated ICLEI Water Campaign and similar approaches to Cottesloe will be initiated.

Whilst the Town of Cottesloe is showing leadership in managing their water resources it should be noted that the DOW Report made mention of its view toward diverting stormwater into the groundwater; as follows:

> *"Diverting stormwater to groundwater, as a means to reduce the impacts of its contaminants on recreational activities and the environment, without controlling and treating the sources of contaminants, is not recommended. Some local governments are currently diverting stormwater this way and others are planning to implement this practice. This is not recommended because we do not know the degree of connection between stormwater, groundwater and near-shore coastal zones, nor what happens to the contaminants as they make their way through these different water bodies".*

It should be noted that given the above information the City will ensure, where possible, that it installed appropriate engineering treatments i.e. gross pollutant traps, vegetated swales etc to ensure any water entering the groundwater is filtered and cleared of contaminants.

ATTACHMENTS

Attachment 1	Map of Outfalls Location within the City of Joondalup
Attachment 2	Details of Coastal Outfalls within the City of Joondalup
Attachment 3	Outfalls in Yellagonga Regional Park
Attachment 4	Septic Tanks in Marmion, Sorrento and Duncraig
Attachment 5	Septic Tanks in Mullaloo

VOTING REQUIREMENTS

Simple Majority

That Council:

1 NOTES:

(a) the progress that has occurred with addressing stormwater outfalls in the Yellagonga Regional Park;
(b) the progress that has occurred with addressing stormwater outfalls along the coast;
(c) the significant costs associated with upgrading stormwater outfalls and converting septic tanks to deep sewage;
(d) that the quality of water in the City's coastal areas according to Health Department testing is not being adversely affected by Septic Tanks;
(e) that the Water Corporation has completed its sewage infill program in the coastal areas of Joondalup;

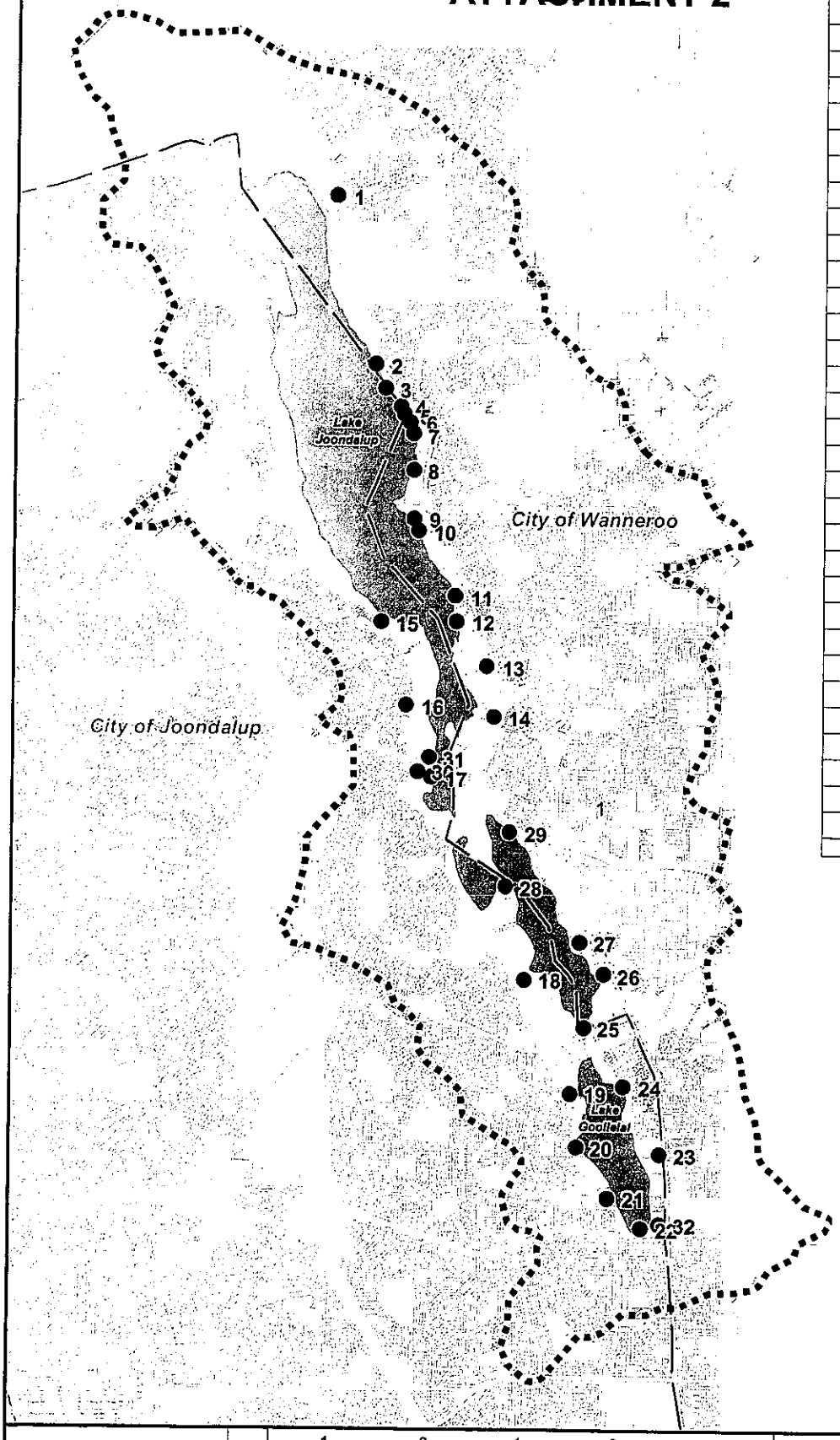
2 REQUESTS that the City again write to the Water Corporation to encourage them to progress the Infill Sewage Program in Kingsley;

3 REQUEST that the City examines the cost of connecting the septic tanks at the surf life saving clubs and other smaller installations along the coast, and determine if there are potentially any grants available that could largely cover the associated costs;

4 SEEKS external funding opportunities to address all storm water outfalls and septic tanks identified within the City's plans;

5 REFERS Report CJ177-09/08 to the Sustainability Advisory Committee for its information and advice;

6 SEEKS advice from the Swan Catchment Council on its future plans in relation to stormwater outfalls and septic tanks.



Outfall_No	Description
1	Sump (COW)
2	Bubble up (COW)
3	Bubble up (COW)
4	Piped (COW)
5	Piped (COW)
6	Piped (COW)
7	Piped (COW)
8	Piped (COW)
9	Piped (COW)
10	Piped (COW)
11	Piped (COW)
12	Piped (COW)
13	Sump (COW)
14	Sump (COW)
15	Sump (COJ)
16	Sump (COJ)
17	Piped (COJ)
18	Piped (COJ)
19	Piped (COJ)
20	Bubble up (COJ)
21	Bubble up (COJ)
22	Piped (COJ/WaterCorp)
23	Sump (COJ/COW/MRWA)
24	Piped (COJ)
25	Piped (COJ)
26	Piped (COW)
27	Sump (COW)
28	Sump (COW)
29	Sump (COW)
30	Sump (COJ)
31	Sump (COJ)
32	Sump (COJ/COW)

Outfall Location
- Outfall/Sump

Municipal Boundary
- Boundary

Yellagonga Catchment
- Boundary

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N

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Kilometers

Scale (A4): 1 : 60000 | Date: 14/08/2008 | Compiled: D. France

File: Yellagonga Regional Park Stormwater Drainage Outfalls complete A4.wor

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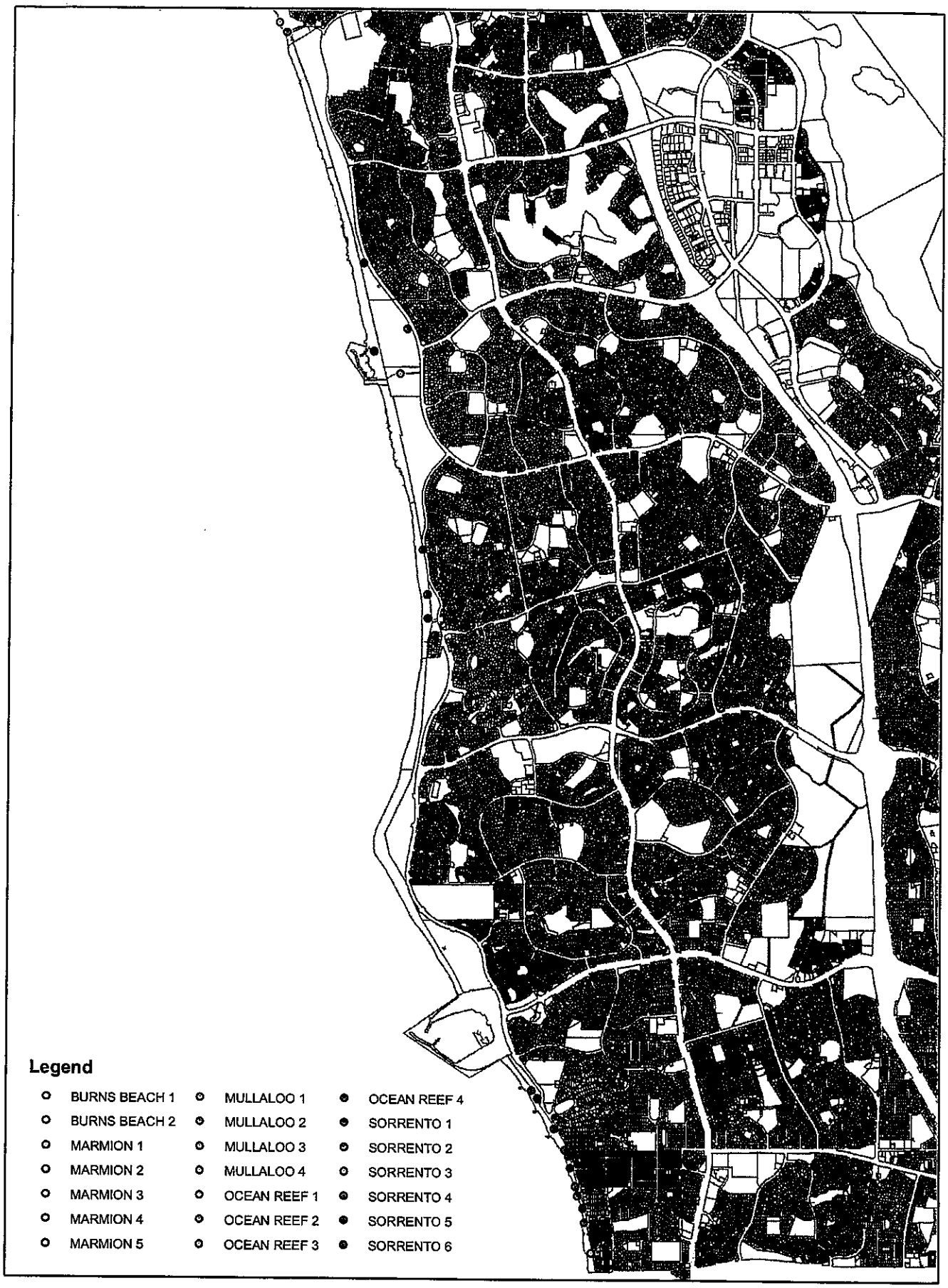
Stormwater Drainage Outfall Locations Yellagonga Regional Park



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COASTAL DRAINAGE OUTFALLS
CITY OF JOONDALUP

Attachment 4

CITY OF JOONDALUP STORMWATER DRAINAGE BEACH AREAS DISCHARGE

OUTFALL	STUDY ID	LOCATION	TYPE OF DISCHARGE	LOCATION OF DISCHARGE	COMMENT
MARMION 1		Between Troy Av and Lennard St	Open Pipe	Scenario 2 - Dune discharge	Flows thru to beach and ocean
MARMION 2		Between Troy Av and Ozone Rd	Open Pipe	Scenario 2 - Dune discharge	Soaks thru dunal system to groundwater
MARMION 3		Between Ozone Rd and Bettles St	Open Pipe	Scenario 2 - Dune discharge	Flows thru dunes to beach
MARMION 4	NST01(JND05)	MAAC Southern Discharge	Open Pipe	Scenario 3 - Beach discharge	Flows thru beach to ocean
MARMION 5		MAAC Northern Discharge	Open Pipe	Scenario 2 - Dune discharge	Overgrown - soaks to groundwater
SORRENTO 1	NST03(JND04)	High St/WCD intersection	Open Pipe	Scenario 3 - Beach discharge	On edge of beach and dunes - to ocean
SORRENTO 2		Clontarf St/WCD intersection	Open Pipe	Scenario 2 - Dune discharge	Soaks into groundwater
SORRENTO 3	NST04(JND03)	Ross Av/WCD intersection	Open Pipe	Scenario 2 - Dune discharge	Flows thru beach to ocean
SORRENTO 4	NST05(JND02)	Raleigh Rd/WCD intersection	Open Pipe	Scenario 2 - Dune discharge	Flows thru dunes to beach & ocean
SORRENTO 5		Sorrento Surf Club Southern soak	Soakwell	Scenario 1 - Soak to G/water	In beach
SORRENTO 6		Sorrento Surf Club Northern discharge	Open Pipe	Scenario 2 - Dune discharge	Flows to beach and ocean
MULLALOO 1		Merrifield Pl soak	Soakwell	Scenario 1 - Soak to G/water	In residential area
MULLALOO 2		Mullaoo Surf Club car park	Soakwell	Scenario 1 - Soak to G/water	In Dunes
MULLALOO 3		Tom Simpson Park Carpark	Sump	Scenario 1 - Soak to G/water	In Dunes
MULLALOO 4		Korella St/Oceanside Prom intersection	Open Pipe	Scenario 1 - Soak to G/water	Swail in dunes
OCEAN REEF 1		Boat Harbour entry road	Open Pipe	Scenario 1 - Soak to G/water	In Dunes
OCEAN REEF 2		Boat Harbour car park sump	Sump	Scenario 1 - Soak to G/water	In Dunes
OCEAN REEF 3		Ocean Reef Road North of Hodges Dr	Sump	Scenario 1 - Soak to G/water	In Dunes
OCEAN REEF 4		Ocean Reef Road North of Resolute Way	Open Pipe	Scenario 1 - Soak to G/water	In Dunes
BURNS BEACH 1	JND01b	Southern car park	Open Pipe	Scenario 2 - Dune discharge	Flows thru dunes
BURNS BEACH 2	JND01a	Groyne	Bubble up gully	Scenario 3 - Beach discharge	Flow to ocean

Attachment 5 - Septic Tanks Sorrento & Marmion

Attachment 6 - Septic Tanks Mullaloo

Attachment 5: Septic Tanks Mullaloo