Sydney Metropolitan Area Harbour Swimming Sites

Lower Georges River
Lower Georges River

Sites: Jew Fish Bay Baths, Como Baths, Oatley Bay Baths, Carss Point Baths, Sandringham Baths and Dolls Point Baths
**Lower Georges River**

**Location**

The Lower Georges River is the 10-kilometre downstream reach of the 96-kilometre-long Georges River. Land use in the Lower Georges River catchment is mostly residential, with some industrial, commercial, recreational and bushland. Hurstville, Kogarah, Rockdale and Sutherland Councils operate in this area.

**Compliance with guidelines**

Compliance of Lower Georges River sites with the guidelines was varied during summer 2004–2005 (Table 21).

Dolls Point Baths complied 100% of the time for both indicators, and a relatively high level of compliance was also recorded at Jew Fish and Sandringham baths. Enterococci compliances of less than 80% were recorded at Como, Oatley Bay and Carss Point Baths.

The range of indicator bacteria levels measured at Botany Bay, Lower Georges River and Port Hacking swimming areas during summer 2004–2005 is shown in Figure 28. Lower Georges River sites are highlighted in grey. Levels of faecal coliforms and enterococci tended to be similar to the range of values measured across the local estuaries.

**Ranking of beaches**

All monitored harbour and ocean beach swimming locations in the Hunter, Sydney and Illawarra regions were ranked on the basis of their compliance with swimming guidelines during summer 2004–2005. A total of 23 rankings were determined for the 126 sites, with many sites ranked equally. Dolls Point Baths was ranked equal first, while Jew Fish Bay Baths, Como and Sandringham baths were also in the top ten rankings. Carss Point Baths was ranked 14th and Oatley Bay Baths 17th (Table 21).

**Actions to improve water quality**

Actions specific to individual swimming locations are included on the beach pages. Improvements in water quality are also expected as a result of the Georges River Combined Councils Committee, which includes the ‘Riverkeeper Program’.

**Georges River Combined Councils Committee**

The Georges River Combined Councils Committee consists of nine Councils working together to lobby for the protection of the River. The Committee manages the ‘Riverkeeper Program’, which has held a number of clean-ups removing litter from the foreshores for the Georges River. It assists Councils and other stakeholders to rehabilitate the River to ensure a sustainable future.

**Grant Funding**

Hurstville Council, Kogarah Council and Rockdale City Council received funding through the DEC Sustainability Grants Program for the Sustainable Living in St George – Retrofitting for Residents program, involving environmental assessments and retrofits for 63 households in the area.

**Rockdale Council**

*Street Sweeping:* Council has continued its street sweeping program and monitors the waste collected by street sweepers.

*Scott Park Wetland:* The wetland officially opened in March 2005 after construction over the last 2 years on a disused soccer field at Dolls Point. The wetland treats water flowing into the lower Georges River.

**School Education:** Council visited local primary schools to conduct an environmental education lesson focusing on stormwater management. Stage 1 and 5 students participated in the program, and at the end of the session were given a take-home exercise to encourage them to take the environmental messages home to their families.

Council has also prepared a ‘Schools Environmental Management Kit’, which includes posters, stickers, and a drain stencil. The Kit has been distributed to all primary schools in the Rockdale area.

**Community Education:** Educational signage has been designed for the Georges River Catchment. The signs consist of an aerial
Harbourwatch

photo of the catchment, with arrows showing where stormwater flows. Residents are able to locate where they live on the signs and see where their drains discharge into the waterways.

As part of Council’s educational program, tours have been held at local wetlands, led by a local wetland specialist, and there was a ‘Coastal Activities Day’ aimed at educating the whole family.

Lower Georges River Stormwater Action Project: In reviewing its progress in implementing the Lower Georges River Stormwater Management Plan, Council developed a new set of Council-wide stormwater management actions and integrated them into its Environment Plan and consequently Management Plan. Implementation of these actions is ongoing.

Hurstville Council

Plan of Management for Oatley Park: Council has prepared a Plan of Management for Oatley Park that identifies and addresses key issues for Oatley Park and provides guidelines for the short- and long-term management of this significant area of remnant bushland.

Stormwater Training and Internal Audit Program: Council’s staff developed this program to improve awareness, knowledge and skills of staff. The internal audit program ensures that standard operational environmental procedures are being applied and that good practices are being implemented.

Stormwater Management: Council has installed 13 GPTs, as well as around 500 litter traps in pits around the Hurstville CBD. It has also constructed the Riverwood and Lime Kiln Bay Wetlands. The stormwater devices are regularly maintained and improve the stormwater quality entering the Georges River.

Catchment Care at Hurstville: The Council continues to deliver a primary school education program, which covers stormwater pollution and catchment management issues. A catchment model is also used to demonstrate stormwater pollution and how it affects our waterways.

Sutherland Shire Council

Woronora Estuary Management Plan: Council has completed data collection and interpretation of the first stage of the plan. Commencement of the second and final stage of the plan is underway and involves the preparation of an estuary processes model and finalising of the Woronora Estuary Management Plan.

Kogarah Council

Water Quality Management Strategy: Kogarah Council has developed a targeted ‘Water Quality Management Strategy’ (WQMS) based on the framework of risk assessment and management. The WQMS aims to be a key decision-making tool for council. A community-based water quality monitoring program has also been established, targeting areas that have been identified in the water quality management strategy. The monitoring program involves the collection of water samples from a variety of locations within the local government area every month.

New Gross Pollutant Traps: The last remaining untreated stormwater outlets draining into Kogarah Bay at Mayor Street and Payten Street have been fitted with litter and sediment control devices. A combination of pit litter baskets, Permapave pavers and pit lintel skirts were installed in February March 2005 to capture and filter gross pollutants and sediments.

A continuous deflective separator (CDS) unit was installed (November 2004) on the western side of the Moore Reserve Wetland stormwater drainage system. It is believed that this GPT will improve the health of Moore Reserve Wetland and Oatley Bay.

Installation of litter and sediment control devices at Donnelly Reserve, Kyle Bay; and at Connells Point Reserve, Connells Point and Shipwright Bay, Blakehurst, will improve the stormwater quality in the Bays and the Georges River.

Stormwater Quality Device Management: Around 113 tonnes of rubbish was collected last year from pits and small GPTs and disposed of by Kogarah Council. The larger GPTs located in Poulton Park (South Hurstville), Moore Reserve (Hurstville

254

State of the Beaches 2004–2005
Grove), Empress Reserve (Hurstville South), Donnelly Reserve (Connells Point) and Grosvenor Reserve (Hurstville South) are cleaned on a regular maintenance cycle. This year, approximately 85 tonnes of rubbish was removed from our larger GPTs.

Community Education: Educational signage has been installed in Moore Reserve, Poulton Park, Empress Reserve, Donnelly Reserve and Grosvenor Reserve. These signs explain how a GPT functions, how many pollutants are removed, and what the impact is on receiving waters.

At Sans Souci public schools, Council has implemented an interactive stormwater education project called Catchment Crusaders that aims to minimise the generation of pollution and its impact.

Table 21: Compliance and Ranking of Lower Georges River Sites during Summer 2004–2005

<table>
<thead>
<tr>
<th>Site</th>
<th>Compliance (%)</th>
<th>Overall ranking (out of 23)</th>
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<tbody>
<tr>
<td></td>
<td>Faecal Coliforms</td>
<td>Enterococci</td>
</tr>
<tr>
<td>Jew Fish Bay Baths</td>
<td>100</td>
<td>94</td>
</tr>
<tr>
<td>Como Baths</td>
<td>100</td>
<td>78</td>
</tr>
<tr>
<td>Oatley Bay Baths</td>
<td>84</td>
<td>69</td>
</tr>
<tr>
<td>Carss Point Baths</td>
<td>97</td>
<td>69</td>
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<td>Sandringham Baths</td>
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<tr>
<td>Dolls Point Baths</td>
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<td>100</td>
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Figure 28: Bacterial Levels at Lower Georges River, Botany Bay and Port Hacking Sites during Summer 2004–2005

Faecal coliform density (cfu/100 mL)

Enterococci density (cfu/100 mL)
Jew Fish Bay Baths

Description
This is a 200-metre-long netted swimming enclosure with a narrow, sandy beach. The baths are situated within the 45-hectare Oatley Park.

Pollution Sources
Stormwater drains discharge directly to the beach area. This site may also be affected by poor quality water from the upper Georges River.

Actions
Hurstville Council has installed gross pollutant traps and rehabilitated a large wetland to remove pollutants and enhance the water quality of Jew Fish Bay.

Compliance
Faecal coliform and enterococci compliance with swimming guidelines has generally been high over the last 5 years, ranging from 81% to 100%.

Response to Rainfall
Bacterial densities increased with increasing rainfall. Faecal coliform levels occasionally exceeded the median guidelines after 5 mm of rain or more in the previous 24 hours. Elevated enterococci levels were frequently recorded after 10 mm of rain or more in the previous 24 hours.

Season Data

Guidelines
(see page 7 for details)

--- 80th percentile

Faecal Coliforms

Enterococci

| rainfall | individual result | rolling median | rolling 80th percentile |

--- median guidelines
Como Baths

Description  
The enclosed tidal baths are approximately 25 metres wide and include a narrow, sandy beach. The baths are situated adjacent to Como marina and back on to the Como Pleasure Gardens.

Pollution Sources  
Several stormwater drains discharge in the vicinity of the baths. Waters from the Woronora River may also affect water quality. Septic tank seepage from several unsewered properties in Como may also be a source of pollution.

Actions  
Sutherland Shire Council continues to implement the Woronora Estuary Management Plan.

Compliance  
With the exception of one season, faecal coliform levels complied 100% of the time over the past 5 years. Enterococci compliance has been more varied, with compliances of less than 85% recorded in three seasons (including summer 2004–2005).

Response to Rainfall  
Faecal coliform densities generally increased with increasing rainfall, occasionally exceeding the median guideline in response to 5 mm of rain or more in the previous 24 hours. Enterococci densities often exceeding the median guideline in response to 5 mm of rain or more in the previous 24 hours.

Season Data  

--- median guidelines

<table>
<thead>
<tr>
<th>--- rainfall</th>
<th>individual result</th>
<th>rolling median</th>
<th>rolling 80th percentile</th>
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</thead>
</table>

Guidelines  
(see page 7 for details)  
--- median guidelines  
--- 80th percentile
Oatley Bay Baths

Description
This netted swimming enclosure is approximately 50 metres long and backs on to a small beach. A recreational reserve and picnic area border the beach.

Pollution Sources
A stormwater drain discharges alongside the swimming enclosure. Sewer overflows discharge into Oatley Bay during wet weather.

Actions
Kogarah Council is committed to the Oatley Pleasure Grounds Creek Restoration and Moore Reserve Wetlands Projects to improve water quality in Oatley Bay through litter and sediment reduction.

Compliance
Faecal coliform levels complied with swimming guidelines between 81% and 100% of the time over the last 5 years. Compliance with the enterococci criteria has ranged from 48% to 100% of the time.

Response to Rainfall
Bacterial densities increased with increasing rainfall. Faecal coliform levels often exceeded the median guideline limit after 10 mm of rain or more in the previous 24 hours. Elevated enterococci densities have frequently been recorded when 5 mm of rain or more has fallen in the previous 24 hours. These trends are also apparent in the Season Data plots below.

Season Data

Faecal Coliforms

Enterococci

Guidelines
(see page 7 for details)
— median guidelines
— 80th percentile

Oatley Bay Baths
Annette St
Oatley Point
Oatley Pleasure Grounds
Queens Rd
Georges River
**Carss Point Baths**

**Description**
This is a 100-metre by 60-metre netted swimming enclosure that backs on to a narrow beach.

**Pollution Sources**
Stormwater drains discharge in the vicinity of the swimming enclosure, bringing litter from two major roadways: the Princes Highway and King Georges Road. Sewer overflows can discharge into Kogarah Bay during wet weather.

**Actions**
Kogarah Council maintains gross pollutant traps at Carss Park canal, and has developed the Kogarah Bay Estuary Management Plan, in partnership with other stakeholders, to sustainably manage Kogarah Bay into the future.

**Compliance**
Faecal coliform compliance with swimming guidelines has generally been high over the last 5 years, ranging from 81% to 100%. Compliance with the enterococci criteria has ranged from 58% to 100% of the time.

**Response to Rainfall**
Faecal coliform densities often exceeded the median guideline limit in response to 5 mm of rain or more in the previous 24 hours. Elevated enterococci levels were frequently recorded after 5 mm of rain or more in the previous 24 hours.

**Season Data**

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<th>Enterococci</th>
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<th>Bacterial count/100 mL</th>
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</thead>
<tbody>
<tr>
<td>24-h rainfall (mm)</td>
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- **Faecal Coliforms**
- **Enterococci**

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<th>Enterococci</th>
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<td>Nov-04</td>
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- **Faecal Coliforms**
- **Enterococci**

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<th>Enterococci</th>
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<td>May-05</td>
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<td>Sep-05</td>
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<td>Nov-05</td>
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<table>
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<th>Bacterial count/100 mL</th>
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</thead>
<tbody>
<tr>
<td>24-h rainfall (mm)</td>
</tr>
</tbody>
</table>

- **Faecal Coliforms**
- **Enterococci**

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**Note:**
- # winter season
- # summer season
**Sandringham Baths**

**Description**
This is a 30-metre by 40-metre netted swimming enclosure that is backed by a narrow beach and a promenade.

**Pollution Sources**
A stormwater drain discharges alongside the swimming enclosure.

**Actions**
Rockdale City Council has constructed the Scotts Park Wetland, which treats water discharging in close vicinity of the baths.

**Compliance**
Faecal coliform and enterococci levels complied with swimming guidelines 86% of the time or more over the last 5 years.

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**Response to Rainfall**
Elevated faecal coliform levels were recorded after 20 mm of rain or more. Enterococci densities generally increased with increasing rainfall, often exceeding the median guideline in response to 10 mm of rain or more in the previous 24 hours.

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**Season Data**

- **Faecal Coliforms**
  - Rainfall
  - Individual result
  - Rolling median
  - 80th percentile

- **Enterococci**
  - Rainfall
  - Individual result
  - Rolling median
  - 80th percentile

Guidelines
(see page 7 for details)
- Median guidelines
- 80th percentile
Dolls Point Baths

Description
This is a 50-metre by 30-metre netted swimming enclosure with a narrow sandy beach. A large recreational area backs the swimming area.

Pollution Sources
An open stormwater channel and stormwater drains discharge to the beach in the vicinity of the swimming enclosure.

Actions
Rockdale City Council has installed a specialised gross pollution trap called a Bandalong boom in Waradiel Creek at Peter Depena Reserve, which is located near the baths.

Compliance
Faecal coliform and enterococci levels complied with swimming guidelines 86% of the time or more over the last 5 years.

Response to Rainfall
Bacterial densities increased with increasing rainfall. Faecal coliforms exceeded the median guidelines after 20 mm of rain or more in the previous 24 hours. Elevated enterococci levels were occasionally recorded after 10 mm of rain or more in the previous 24 hours and always after 20 mm of rain or more.

Season Data

--- median guidelines

Guidelines (see page 7 for details)
- median guidelines
- 80th percentile

Harbourwatch

State of the Beaches 2004–2005
Sydney Metropolitan Area Harbour Swimming Sites

Botany Bay
Botany Bay

Sites: Ramsgate Baths, Monterey Baths, Brighton-Le-Sands Baths, Kyeemagh Baths, Foreshores Beach, Yarra Bay, Frenchmans Bay, Congwong Bay and Silver Beach
Botany Bay

Location
Botany Bay is a wide, shallow bay. Cooks River and Georges River flow into the bay. Land use in the Botany Bay catchment includes residential, industrial, commercial, recreational and bushland (including national parks and nature reserves). Botany Bay, Randwick, Rockdale and Sutherland Councils operate in this area.

Compliance with guidelines
Compliance of Botany Bay sites with the swimming guidelines was varied during summer 2004–2005 (Table 22). Congwong Bay was the only site to achieve 100% compliance for both indicators, though high levels of compliance were also recorded at Monterey Baths and Silver Beach. The lowest levels of compliance were recorded at Brighton-Le-Sands Baths and, despite improvement from last year, Yarra Bay.

The range of indicator bacteria levels measured at Botany Bay, Lower Georges River and Port Hacking swimming areas during summer 2004–2005 is shown in Figure 29. Botany Bay sites are highlighted in grey. Bacterial levels at most sites were within the same range measured across local estuaries.

Ranking of beaches
All monitored harbour and ocean beach swimming locations in the Hunter, Sydney and Illawarra regions were ranked on the basis of their compliance with swimming guidelines during summer 2004–2005. A total of 23 rankings were determined for the 126 sites, with many sites ranked equally.

The ranking for the Botany Bay swimming sites varied highly, with one site ranked equal 1st and the remaining eight sites ranked between equal 4th and 17th.

Actions to improve quality
Actions specific to individual swimming locations are included on the beach pages. Improvements in water quality will also be achieved through stormwater management plans.

Stormwater management plans
Local councils have developed Stormwater Management Plans for Mill Pond Creek, Lower Georges River and Cooks River. These plans contain many structural and non-structural actions that will be implemented over the next 5 years to improve water quality in these waterways and in Botany Bay.

Cooks River Ecology Grant
Rockdale, Kogarah, Canterbury and Marrickville Councils received a grant from the Cooks River Foreshore Improvement Program to undertake an ecological study in relation to water quality, of the Cooks River. The project’s objective is to establish a cost-effective ecological monitoring program that will develop information and guidelines for the management of tidal vegetation and inform future capital works projects along the riverbanks.

Rockdale Council
Gross Pollutant Traps: Council has installed 20 small gully pit traps in the Bardwell Creek Catchment Area. These devices prevent gross pollutants from eventually washing up on the beaches at the northern end of Botany Bay. A further trash rack and four large mesh screens along the Scarborough Ponds Outlet Pipeline have been installed to improve water quality, ventilation and solar access to promote fish access along the pipelines between the ponds and Botany Bay.

Clean Beach Challenge: Rockdale City Council received highly commended awards for Lady Robinsons Beach in two categories at the NSW final of the Keep Australia Beautiful Clean Beach Challenge Awards.

Lady Robinsons Beach Project: Rockdale City Council, the New South Wales Government and the Sydney Airport Corporation Limited jointly funded the restoration of the section of Lady Robinsons Beach from Ramsgate to Brighton-Le-Sands across the foreshore at Monterey.

Lady Robinsons Beach received commendations for the Local Government Leadership Award and the Beach Spirit...
Award for the planning, developing and maintenance of the beach in an excellent condition for residents and visitors. The Local Government Leadership Award recognised Council’s ability to work with a number of stakeholders for the best interests of the beach. Examples of this are the construction of the groynes to help prevent the depletion of sand, and the coastal dune restoration along the foreshore.

Part of the project is to re-plant seagrasses to anchor some of the sand. A second maintenance process will be involved, including more dredging and restoration in about 5 to 10 years’ time to replenish the beach back to useable form.

*City of Botany Bay*

*Stormwater re-use:* As the predominant subsurface material in Botany is sand, which forms an aquifer that drains to Botany Bay, Council has developed guidelines for the design of stormwater drainage systems. The guidelines require stormwater re-use for non-potable purposes for developments wherever possible. Stormwater overflows from such systems can be directed to Council’s stormwater system, subject to the provision of stormwater pollution prevention devices to remove litter and sediment.

*Watertight program:* Council Officers attended and assisted in the implementation of the Department of Education’s Watertight Program at Banksmeadow Public School. The children were shown a drainage and stormwater map of the local area depicting the school and how the drains connected via pipes that lead to Botany Bay and the Sir Joseph Banks Park reserve ponds.

A field trip to Sir Joseph Banks Park was also conducted to view the health of the ponds by identifying several indicator species.

*Orica (Former ICI Site) Botany Groundwater Project Community Liaison Committee:* Botany Council facilitates and participates in the Orica Botany Groundwater Project Community Liaison Committee, which is monitoring the required cleanup and provides a forum for owners and residents to be aware of the issues involved and the proposals for remediation.

*Other activities:* Council was involved in ‘Clean Up Australia Day’ at Foreshores Beach and Sir Joseph Banks Park. Council also participated in the DEC Household Chemical Collection Day to reduce the risk of chemicals ending up in our waterways, being dumped in public areas or stored inappropriately.

*Randwick City Council*

*Soil and water management:* Randwick City Council continues to implement the Southern Sydney Regional Organisation of Councils (SSROC) soil and water management program. This program aims to prevent degradation of waterways and stormwater systems by minimising the loss of soil and other building materials from building and construction sites.

*Summer Activities Program:* Council has conducted Summer Activities aimed at increasing the understanding and appreciation of marine and coastal water quality and conservation issues by residents. This program is resident-funded by the 5-year environmental levy.

*EcoLiving Fair:* Randwick’s first EcoLiving Fair was held on World Environment Day and provided residents with practical sustainability workshops and demonstrations around the home and garden, such as keeping chemicals and cleaning agents out of the drainage system. The fair also included environmental theatre for children and adults, reinforcing messages on reducing litter.

*Rainwater tank policy:* A policy applies to all new developments in the council area. It contributes to the efficient use of stormwater, which can be used within premises for flushing of toilets and in laundries, as well as externally.
Table 22: Compliance and Ranking of Botany Bay Sites during Summer 2004–2005

<table>
<thead>
<tr>
<th>Site</th>
<th>Compliance (%)</th>
<th>Overall ranking (out of 23)</th>
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<tbody>
<tr>
<td></td>
<td>Faecal Coliforms</td>
<td>Enterococci</td>
</tr>
<tr>
<td>Ramsgate Baths</td>
<td>100</td>
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<tr>
<td>Monterey Baths</td>
<td>100</td>
<td>91</td>
</tr>
<tr>
<td>Brighton-le-Sands Baths</td>
<td>84</td>
<td>69</td>
</tr>
<tr>
<td>Kyeemagh Baths</td>
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<td>Congwong Bay</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Silver Beach</td>
<td>100</td>
<td>91</td>
</tr>
</tbody>
</table>

Figure 29: Bacterial Levels at Lower Georges River, Botany Bay and Port Hacking Sites during Summer 2004–2005
Ramsgate Baths

Description
The baths are a 50-metre-square swimming enclosure situated at the southern end of Lady Robinsons Beach. A boardwalk and a small recreational reserve back the swimming enclosure.

Pollution Sources
Stormwater drains discharge to the beach in the vicinity of the swimming enclosure. Outflow from the Georges River and Cooks River may also affect the water quality of the swimming area.

Actions
The Lady Robinsons Beach Restoration Project has commenced and is aimed at preventing further sand erosion, restoring foreshore areas and stabilising the beach area for recreational use.

Compliance
Faecal coliform levels complied with swimming guidelines between 86% and 100% of the time over the last 5 years. Enterococci compliance has ranged from 77% to 100% in the past 5 years.

Response to Rainfall
Bacterial densities increased with increasing rainfall. Faecal coliform levels occasionally exceeded the median guideline limit after 5 mm of rain or more in the previous 24 hours. Enterococci levels occasionally exceeded the median guideline limit after little rainfall and frequently exceeded the guidelines after 10 mm of rain or more in the previous 24 hours.

Season Data
Monterey Baths

Description
This swimming area is situated towards the southern end of Lady Robinsons Beach. The baths are not netted and are backed by a sandy beach and a small recreational reserve.

Pollution Sources
Stormwater drains discharge to the bay in the vicinity of the swimming enclosure. Outflows from the Georges River and Cooks River can affect the water quality of the swimming area.

Actions
The Lady Robinsons Beach Restoration Project has commenced and is aimed at preventing further sand erosion, restoring foreshore areas and stabilising the beach area for recreational use.

Compliance
Faecal coliform levels complied with swimming guidelines 100% of the time in all but one season over the last 5 years. Enterococci compliance has also been high, ranging from 81% to 100% of the time.

Response to Rainfall
Elevated faecal coliform levels were occasionally recorded after 10 mm of rain in the previous 24 hours. Enterococci levels occasionally exceeded the median guideline limit after 5 mm of rain or more in the previous 24 hours. The response to rainfall is reflected in the Season Data plots below.

Season Data

Faecal Coliforms

Enterococci

Guidelines
(see page 7 for details)
Brighton-le-Sands Baths

Description
This 60-metre by 50-metre netted swimming enclosure is situated towards the centre of Lady Robinsons Beach. The southern edge of the swimming enclosure is a pier.

Pollution Sources
Stormwater drains discharge to the beach in the vicinity of the swimming enclosure. Outflow from the Cooks River can also affect the water quality of the swimming area.

Actions
The Lady Robinsons Beach Restoration Project has commenced and is aimed at preventing further sand erosion, restoring foreshore areas and stabilising the beach area for recreational use.

Compliance
Faecal coliform levels complied with swimming guidelines 84% of the time or more over the last 5 years. Compliance with the enterococci criteria has been more variable, ranging from 69% to 100% of the time.

Response to Rainfall
Faecal coliform densities often exceeded the median guideline limits in response to 10 mm of rain or more in the previous 24 hours. Enterococci levels frequently exceeded the median guideline limit after 10 mm of rain or more in the previous 24 hours. These trends are also apparent in the Season Data plots below.

Season Data
Faecal coliforms and enterococci levels are shown for different rainfall amounts and seasons.
Kyeemagh Baths

Description
This 50-metre by 70-metre netted swimming enclosure is situated at the northern end of Lady Robinsons Beach. The baths have a narrow, sandy beach and are backed by a recreational reserve.

Pollution Sources
Stormwater drains discharge in the immediate vicinity of the swimming enclosure. Outflow from the Cooks River may also affect water quality.

Actions
Rockdale City Council have installed 20 small gully pit traps in the Bardwell Creek Catchment Area to prevent gross pollutants from eventually washing up on Kyeemagh Beaches. Council have also erected educational signs illustrating the Bardwell Valley Catchment and stormwater flows and discharge points.

Compliance
Faecal coliform compliance with swimming guidelines has varied over the last 5 years, ranging from 81% to 100%. Enterococci compliance has also varied over the last 5 years, ranging from 74% to 100%.

Response to Rainfall
Faecal coliform and enterococci levels frequently exceeded the median guideline limits in response to 10 mm of rain or more in the previous 24 hours. The response to rainfall is also apparent in the Season Data plots below.

Season Data

<table>
<thead>
<tr>
<th>rainfall</th>
</tr>
</thead>
<tbody>
<tr>
<td>individual result</td>
</tr>
<tr>
<td>— rolling median</td>
</tr>
<tr>
<td>— — rolling 80th percentile</td>
</tr>
</tbody>
</table>

Guidelines
(see page 7 for details)
| — median guidelines |
| — — 80th percentile |

Faecal Coliforms

Enterococci
Foreshores Beach

Description
This narrow beach, approximately 2.2 kilometres long, is opposite Sydney Airport’s third runway. The swimming area is not netted.

Pollution Sources
Stormwater drains discharge along the length of the beach. Sewage overflows discharge into Mill Pond Diversion Channel at the western end of the beach, and industrial and urban runoff discharge into Penrhyn estuary at the eastern end of the beach.

Actions
City of Botany Bay Council has been involved with numerous environmental education programs and has also developed guidelines for the design of stormwater drainage systems to improve water quality.

Compliance
Faecal coliform compliance has ranged from 55% to 100% of the time. Enterococci compliance has also been varied. Winter compliances have mostly been higher than summer compliances for both indicators.

Response to Rainfall
Faecal coliform densities often exceeded the median guideline limit in response to rainfall of 5 mm or more in the previous 24 hours. Enterococci levels occasionally exceeded the median guideline after little or no rainfall and frequently exceeded the guidelines after 5 mm of rain or more in the previous 24 hours. The response to rainfall is reflected in the Season Data plots below.
Yarra Bay

Description
This is a narrow beach, approximately 750 metres long, with a rock groyne 100 metres from the southern end. The swimming area is not netted. The southern half of the beach is bordered by Yarra Bay Bicentennial Park and Yarra Bay Sailing Club.

Pollution Sources
A stormwater drain discharges at the centre of the beach during both wet and dry weather. Leachate from Botany Cemetery and market gardens can contaminate stormwater discharging to the beach.

Actions
Randwick City Council regularly undertakes street sweeping and beach cleaning.

Compliance
With the exception of the 2003–2004 season, faecal coliform levels have complied 90% of the time or more over the past 5 years. Compliance with the enterococci criteria has been far more variable, ranging from 52% to 100% of the time.

Response to Rainfall
Bacterial densities increased with increasing rainfall. Faecal coliform levels frequently exceeded the median guideline limit after 10 mm of rain or more in the previous 24 hours. Enterococci levels occasionally exceeded the median guideline limit after little or no rainfall and often exceeded the guidelines after 5 mm of rain or more in the previous 24 hours.

Season Data

Guidelines
(see page 7 for details)
— median guidelines
— 80th percentile
**Frenchmans Bay**

**Description**
This narrow beach is approximately 500 metres long, with a rock wall towards the northern end. The swimming area is not netted. A small recreational reserve is situated behind the beach at the southern end.

**Pollution Sources**
Stormwater drains discharge to the beach.

**Actions**
Randwick City Council regularly undertakes street sweeping and beach cleaning.

**Compliance**
Faecal coliform levels complied with swimming guidelines 90% of the time or more over the last 5 years. Compliance with the enterococci criteria has been more variable, ranging from 76% to 100% of the time.

**Response to Rainfall**
Faecal coliform densities sometimes exceeded the median guideline limit in response to 5 mm of rain or more in the previous 24 hours. Enterococci densities regularly exceeding the median guideline limit in response to 5 mm of rain or more in the previous 24 hours.

**Season Data**
- **Faecal Coliforms**
- **Enterococci**
**Congwong Bay**

**Description**
This narrow beach is approximately 150 metres long. The swimming area is not netted, and the beach is bordered by Botany Bay National Park.

**Pollution Sources**
A stormwater drain discharges to the beach. Swimming water quality may also be affected by outflows of poor quality waters from Mill Pond, Cooks River and Georges River during wet weather.

**Actions**
Randwick City Council regularly undertakes street sweeping and beach cleaning.

**Compliance**
Faecal coliform levels complied with swimming guidelines 100% of the time over the last 5 years. With the exception of winter 2004, enterococci levels also complied 100% of the time over the past 5 years.

**Response to Rainfall**
Faecal coliform and enterococci densities regularly exceeded the median guideline limit in response to 20 mm of rain or more in the previous 24 hours. This trend is also apparent in the Season Data plots below.

**Season Data**

| Map: See page 264 for key to map |
Silver Beach

Description
This narrow, sandy beach is approximately 2.8 kilometres long and divided by a number of rock walls. A 150-metre by 100-metre swimming enclosure is situated towards the centre of the beach.

Pollution Sources
Stormwater drains discharge to the beach immediately behind the swimming enclosure and also in the vicinity of the enclosure.

Actions
Sutherland Shire Council will conduct an investigation of beach and coastal processes for the Silver Beach area.

Compliance
With the exception of the 2004 winter season, faecal coliform levels complied 100% with the swimming guidelines over the past 5 years. Enterococci levels have complied more than 85% of the time over the last 5 years.

Response to Rainfall
Faecal coliform and enterococci densities occasionally exceeded their median guideline limits in response to 20 mm of rain or more in the previous 24 hours.

Season Data

---

Bacterial count/100 mL

Faecal Coliforms

Enterococci

---

Guidelines (see page 7 for details)

---

Daily Rainfall (mm)

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State of the Beaches 2004–2005
Sydney Metropolitan Area Harbour Swimming Sites

Port Hacking
Port Hacking

Sites: Gunnamatta Bay Baths, Gymea Bay Baths, Lilli Pilli Bay Baths, Horderns Beach and Jibbon Beach

LEGEND
- Sampling Site
- Major road
- Small stormwater drain
- Medium stormwater drain
- Large stormwater drain
- Open stormwater drain
- Creek
- Designed structure sewage overflow
- Undirected sewage overflow
- Sewage treatment plant
- Park / reserve
- Other land
Port Hacking

Port Hacking Catchment

Port Hacking is the downstream reach of the Hacking River, which flows into Bate Bay. Land use in the Port Hacking catchment is mainly residential on the northern shore, with The Royal National Park on the southern shore.

Sutherland Shire Council operates in this area. The National Parks and Wildlife Service is also responsible for a large area of the catchment.

Compliance with guidelines

Compliance with bacterial guidelines was generally good in Port Hacking during summer 2004–2005 (Table 23).

Four of the 5 sites complied with the faecal coliform and enterococci criteria 100% of the time. Gymea Bay Baths complied with the faecal coliform criteria 88% of the time and with the enterococci criteria 59% of the time.

The range of indicator bacteria levels measured at Botany Bay, Lower Georges River and Port Hacking swimming areas during summer 2004–2005 is shown in Figure 30. Port Hacking sites are highlighted in grey. Levels of faecal coliforms and enterococci were within the range of values measured in other local estuaries.

Ranking of beaches

All monitored harbour and ocean beach swimming locations in the Hunter, Sydney and Illawarra regions were ranked on the basis of their compliance with swimming guidelines during summer 2004–2005. A total of 23 rankings were determined for 126 sites, with many sites ranked equally.

The ranking for Port Hacking swimming areas ranged from equal 1st for Gunnamatta Bay Baths, Lilli Pilli Bay Baths, Hordens Beach and Jibbon Beach to 20th for Gymea Bay Baths.

Actions to improve water quality

Actions specific to individual swimming sites are included on the beach pages. Improvements in water quality are also expected as a result of a stormwater management plan and Stormwater Trust grants.

Hacking River Stormwater Management Plan

Sutherland and Wollongong councils have developed a Stormwater Management Plan for the Hacking River catchment. The plan identified a number of short- and long-term stormwater management strategies, and was reviewed by council. Initiatives arising from the plan include the establishment of a steering committee to assist in the integrated management of stormwater in the catchment; a program of works at ‘hot spots’; conducting and assessing the benefit of community education campaigns; an audit of industrial and commercial premises; and the production of a step-by-step brochure describing development application requirements in relation to stormwater management.

Sutherland Council

Estuary Management Plans (EMP): Sutherland Shire Council has established plans for the Gunnamatta and Gymea Bay estuaries. These plans have made recommendations regarding specific actions to protect water quality in those bays.

New SQIDs: Council has also installed a new gully pit pollutant filter at Maianbar, a GPT at Tonkin Reserve, Gunnamatta Bay, and Kareena Park, Yowie Bay, and a trash rack at Gymea Bay.

Monitoring: Additional weekly water sampling is carried out by Council at popular swimming spots at Swallow Rock at Grays Point and Darook Park at Gunnamatta Bay.

Port Hacking Riverkeeper Program: Council and the NSW Maritime Authority are responsible for the implementation of the environmental management plans applicable to Port Hacking. The program provides enforcement of regulations, development of policy and coordination of programs to rehabilitate the waterways and foreshores to benefit its natural, commercial and recreational values.
Table 23: Compliance and Ranking of Port Hacking Sites during Summer 2004–2005

<table>
<thead>
<tr>
<th>Site</th>
<th>Compliance (%)</th>
<th>Overall ranking (out of 20)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gunnamatta Bay Baths</td>
<td>100 100</td>
<td>1</td>
</tr>
<tr>
<td>Lilli Pilli Bay Baths</td>
<td>100 100</td>
<td>1</td>
</tr>
<tr>
<td>Gymea Bay Baths</td>
<td>88 59</td>
<td>20</td>
</tr>
<tr>
<td>Horderns Beach</td>
<td>100 100</td>
<td>1</td>
</tr>
<tr>
<td>Jibbon Beach</td>
<td>100 100</td>
<td>1</td>
</tr>
</tbody>
</table>

Figure 30: Bacterial Levels at Lower Georges River, Botany Bay and Port Hacking Sites during Summer 2004–2005
Gunnamatta Bay Baths

Description
This is a 50-metre by 30-metre enclosed tidal swimming area with a narrow sandy beach. The beach is adjacent to a large reserve and picnic area.

Pollution Sources
Stormwater drains and sewer overflows discharge to the bay during wet weather, and blocked or damaged sewer mains cause sewage leaks in dry weather.

Actions
Sutherland Shire Council has implemented a program examining the sources of water pollution in Gunnamatta Bay. Council also maintains a gross pollutant trap at Tonkin Park, adjacent to the baths.

Compliance
Faecal coliform compliance with swimming guidelines has generally been high over the last 5 years, ranging from 81% to 100%. Compliance with the enterococci criteria has been far more variable, ranging from 57% to 100% of the time.

Response to Rainfall
Bacterial densities increased with increasing rainfall. Faecal coliforms frequently exceeded the median guideline limit after 20 mm of rain or more in the previous 24 hours. Enterococci levels occasionally exceeded the median guideline after little rainfall and often exceeded the guidelines after 10 mm of rain or more in the previous 24 hours. The response to rainfall is reflected in the Season Data plots below.

Season Data

--- median guidelines

--- rolling 80th percentile

Guidelines
(see page 7 for details)
--- median guidelines
--- 80th percentile
Lilli Pilli Bay Baths

Description
This is a 50-metre by 30-metre tidal swimming area on the western side of Lilli Pilli Point. The pool is netted and is backed by a narrow strip of recreation reserve.

Pollution Sources
Stormwater discharges from residential areas into Lilli Pilli Bay, and nearby water bodies are a potential source of pollution.

Actions
Sutherland Shire Council regularly maintain the baths.

Compliance
Faecal coliform levels complied with swimming guidelines 100% of the time in all but two seasons over the last 5 years. Enterococci compliance has ranged from 81% to 100%, with 100% recorded during the last three seasons.

Response to Rainfall
Faecal coliform densities occasionally exceeded the median guideline limit in response to 20 mm of rain or more in the previous 24 hours. Elevated enterococci levels were frequently recorded after 10 mm of rain or more.

Season Data
Guidelines (see page 7 for details)

--- median guidelines

--- 80th percentile

--- rolling median

--- individual result

--- rainfall
Gymea Bay Baths

Description
This is a 50-metre by 30-metre enclosed tidal swimming area with a narrow, sandy beach. Two small recreation reserves lead to the beach. Coonong Creek flows to Gymea Bay behind the beach.

Pollution Sources
Stormwater discharge from the surrounding residential area and possible sewer overflows from blocked sewer mains.

Actions
Sutherland Shire Council has installed a trash rack in Alcheringa Creek, rehabilitated bushland and removed sediment from the baths as part of the Gymea Bay Estuary Management Plan.

Compliance
Faecal coliform compliance with swimming guidelines has generally been high over the last 5 years, ranging from 84% to 100%. Compliance with the enterococci criteria has been far more variable, ranging from 45% to 100% of the time.

Response to Rainfall
Bacterial densities increased with increasing rainfall. Faecal coliforms often exceeded the median guidelines after 10 mm of rain or more in the previous 24 hours. Enterococci levels sometimes exceeded the median guideline after little or no rainfall and generally exceeded the guidelines after 10 mm of rain or more in the previous 24 hours. The response to rainfall is reflected in the Season Data plots below.

Season Data

Faecal Coliforms

Enterococci

--- median guidelines

--- rolling median

--- rolling 80th percentile

Guidelines
(see page 7 for details)
--- median guidelines
--- 80th percentile
Horderns Beach

Description
This is a 700-metre-long, narrow, sandy beach in Bundeena Bay on the southern side of Port Hacking. The Cronulla–Bundeena wharf and a recreation reserve border the beach on the eastern end. The beach is backed by Bundeena township. A small creek flows to the bay at the eastern end of the beach.

Pollution Sources
There is potential septic tank seepage from the 213 properties in Bundeena and Maianbar not yet connected to Sydney Water’s sewerage system. Stormwater discharge into Bundeena Bay is also a potential source of pollution.

Actions
Sutherland Shire Council maintains two Net Tech® stormwater devices in the immediate area.

Compliance
Faecal coliform levels complied with swimming guidelines 100% of the time in all but two seasons over the last 5 years. Compliance with the enterococci criteria has been more variable, ranging from 76% to 100% of the time.

Response to Rainfall
Faecal coliform and enterococci densities routinely exceeded the median guideline limit in response to 20 mm of rain or more in the previous 24 hours. Enterococci levels occasionally exceeded the median guideline after 10 mm of rainfall or more in the previous 24 hours.

Season Data

--- median guidelines
**Jibbon Beach**

**Description**
This is a 700-metre-long sandy beach located inside the southern entrance to Port Hacking. The beach is backed by the Royal National Park and can be accessed via Bundeena. The water is deep inshore and a popular boating destination. Beach conditions are safest in the eastern corner.

**Pollution Sources**
Stormwater discharge from the nearby residential area of Bundeena is a potential source of pollution, along with discharge of untreated sewage from visiting vessels without holding facilities.

**Actions**
Although there are no actions specific to this beach, the improvements to sewage management in Bundeena and Maianbar should further safeguard the high water quality at this location.

**Compliance**
Faecal coliform levels complied with swimming guidelines 100% of the time over the last 5 years. With the exception of 2003–2004, 100% compliance has also been recorded for enterococci.

**Response to Rainfall**
Elevated levels of faecal coliforms and enterococci were recorded in response to 20 mm of rain or more in the previous 24 hours.

**Season Data**

| rainfall | individual result | — — rolling median | — — rolling 80th percentile |

Guidelines (see page 7 for details)

© — median guidelines

© 80th percentile

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The Harbourwatch Program 285