SEPA
Scottish Environment Protection Agency

Scottish **Bathing Waters** 2005

Contents

Kinghorn (Pettycur)

Foreword

I am pleased to present the Scottish Environment Protection Agency's (SEPA's) report for the 2005 bathing water season. Bathing water quality in Scotland was good overall, with continuing improvements being made. A key highlight for 2005 was that all bathing waters on the west coast of Scotland passed the mandatory EU standards on bathing water quality for the first time.

The monitoring results for Scotland's 60 identified bathing waters continue to show underlying quality improvement. The majority of waters, 57 (95%), met the required European standards - one more than last year, and the same as 2003. It was disappointing that three waters on the east coast - Nairn East, Stonehaven, and Eyemouth - all met standards last year but failed to meet them in 2005. Sewage sources were found to be strongly implicated in all three places. On the other hand, Ettrick Bay passed mandatory standards for the first time, in an area where agricultural diffuse pollution had been reduced.

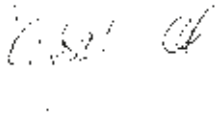
Scottish Water's investment to improve Scotland's ageing sewerage infrastructure has helped to improve water quality. This is an ongoing requirement, upon which Scottish water quality is dependent. It is necessary to continue this cost-effective investment in water and sewage systems to reduce pollution.

In 2005, the first six weeks of the summer were unseasonably wet. Heavy rain can wash animal faeces from fields into local waters, affecting water quality for several days. In many urban areas, combined sewer overflows are necessary to prevent flooding. These storm sewer overflows can cause pollution. Many waters still need substantial improvement to reach EU guideline standards. To achieve this, pollution from sewage and diffuse agricultural sources is being reduced through the provision of advice, investment and testing.

The public is now informed about the quality of our bathing waters by both electronic signage at beaches and information on SEPA's website. The electronic signage project is now fully operational at bathing waters which are susceptible to pollution caused by heavy rainfall.

In early 2006, changes in the list of identified bathing waters are expected to be announced and implemented before the bathing season begins. Further into the future, it is probable that a new EU Bathing Waters Directive will bring in different sampling regimes and compliance standards.

Whatever the outcome of these changes, SEPA will continue to work in partnership with stakeholders to safeguard and improve the quality of Scotland's bathing waters.



Campbell Gemmell
Chief Executive
Scottish Environment Protection Agency
December 2005

Executive summary

In 2005, 95% (57 of 60) of Scottish bathing waters met European standards. For the first time ever, all recognised bathing waters on the west coast met the required standards. This is a great achievement and provides real evidence that the hard work of many organisations to reduce diffuse pollution inputs is working. The Scottish Environment Protection Agency (SEPA) found that even after some wet weather events, samples taken from waters susceptible to diffuse pollution, such as Ettrick Bay on Bute, met standards this year, despite the model based on previous results predicting failure.

The reasons for all three failures – all in waters that have previously met the required standards – have been investigated. Illegal discharge is the suspected cause of one failure and reports have been submitted to the Procurator Fiscal. Sewage pollution contributed to all three failures, emphasising the need for continuing investment in treatment and sewerage infrastructure. This is needed, in particular, to minimise polluting storm sewer overflow events. Diffuse pollution is also heavily implicated in one of the failures and at the many more bathing waters which do not yet meet more stringent 'guideline' quality standards.

This year's results provide tangible evidence of the success of the continuing work by SEPA, the agricultural community, Scottish Agricultural College, National Farmers Union of Scotland and the Scottish Executive Environment and Rural Affairs Department in raising awareness of and providing solutions to the problem of diffuse pollution. Nevertheless, diffuse pollution is still the main source of problems at numerous bathing waters.

For the second year running water quality predictions were available live on SEPA's website for ten waters, including several of those most susceptible to diffuse pollution. The information for these electronic notice boards, strategically sited at beach car parks or entry points, is provided by SEPA however, in 2005, SEPA also took over the overall management of the signage network from the Scottish Executive who had funded its initial purchase and piloting. SEPA continued to work closely with local authorities and landowners involved with the signage project.

The bathing season started badly, with rainfall across Scotland well above average throughout June and early July. Unfortunately, this was enough to cause three waters to fail for the whole season because of the pollution caused by high rainfall run-off. The weather became generally dryer, and there were no further overall failures of the current European standards.

During the year, proposals for a revised EU Bathing Waters Directive emerged. If voted into European law, it will set numerically more stringent standards, but with different assessment criteria. Most importantly, the new directive proposes that up to 15% of results may be disregarded if poor water quality, such as that caused by heavy rainfall, is predicted and warning information is made clearly available to the public through systems such as those already operated by SEPA.

The current set of 60 recognised bathing waters is also set to change before summer 2006. The Scottish Executive has set up an independent panel to make recommendations on desirable changes to the current list of waters, based on information about usage, facilities, management plans and stakeholder submissions. It is expected that the announcement will be made in early 2006, and that the Scottish Ministers will make their decision in time for them to be implemented for the 2006 bathing season.

1 Introduction

1.1 SEPA's role in bathing water quality

The Scottish Environment Protection Agency (SEPA) is the national public body responsible for environmental protection and improvement in Scotland. SEPA's duties include regulating discharges to water, air and land. SEPA also provides environmental advice and information and works in partnership with many public, voluntary and private sector organisations to deliver environmental improvements. In addition to publishing this report, SEPA places monitoring results from bathing waters on its website[1] within a few days of sample collection throughout the bathing season from 1st June to 15th September.

1.2 SEPA's commitment to improving bathing water quality

SEPA recognises the immense economic value of Scotland's relatively unspoiled environment. High-quality bathing waters are important for a wide variety of interests and help to promote the important and valuable tourism industry within Scotland. All possible sources of pollution must be recognised and controlled in order to protect and, where necessary, improve the quality of waters. SEPA will continue working with all other relevant authorities to achieve full compliance with European bathing water standards, to which the Scottish Executive is committed. Section 4 of this report provides specific information about the ongoing work to ensure attainment of current quality standards, and for the attainment of anticipated new and more stringent European standards.

Identified bathing waters are only a small part of Scotland's waters. SEPA is committed to protecting and improving the quality of all controlled waters. In recognition of this, SEPA maintains a policy on microbiological standards for relevant discharges; all new or modified discharges to identified bathing waters must be designed to ensure that the Bathing Water Directive's guideline standards are met. SEPA also promotes these high standards for other recreational waters which are widely used by the public. These are areas outwith identified bathing waters where SEPA recognises that water contact activities are practiced, but which necessarily have a lower priority for investment. It is expected that a current review may promote some of these other waters to become EU recognised bathing waters before the 2006 bathing season.

1.3 Purpose of this report

This report contributes to SEPA's aim of providing useful information on Scotland's environment. As well as containing the water quality monitoring results, it also describes factors underlying the results and outlines site-specific plans for improvement.

The results are presented in two parts: Sections 3.1 and 3.2 cover Scotland's 60 identified bathing waters; Section 3.4 covers other waters which were subject to routine bacteriological quality monitoring during the 2005 bathing season.

The report illustrates the long-term downward trend in average concentrations of indicator bacteria, and details site-specific issues and the initiatives to ensure high-quality bathing water at these sites.

As required by the Directive, the water quality results for the 60 identified bathing waters have been reported to the European Commission (EC), which will publish the results as part of their annual report on the overall quality of bathing waters throughout the countries of the European Union.

[1] www.sepa.org.uk/bathingwaters

2 Background and legislation

2.1 EC Bathing Water Directive (76/160/EEC)

The EC Bathing Water Directive ('the Directive') requires each Member State to identify bathing waters and to take all necessary measures to bring these waters up to the quality standards prescribed. A bathing water is defined as fresh or sea water where bathing is either explicitly authorised and is traditionally practiced by a large number of bathers or is not prohibited. The environmental quality standards are set to protect the environment and public health, and include safe limits for microbiological, physical and chemical quality measures. The Directive lays down requirements for the frequency of sampling, methods of analysis and inspection of bathing areas and the interpretation of results. It also requires the exclusion of results obtained in abnormal circumstances.

2.2 Related legislation

Under the **Control of Pollution Act 1974** as amended (COPA), SEPA issues consents for discharges of sewage and trade effluent to controlled waters, including all coastal and inland waters. The conditions applied to each consent must be met by the discharger, and are designed to enable compliance with relevant water quality objectives.

The **Urban Waste Water Treatment Directive** specifies minimum legal standards for the treatment of municipal waste water. These standards are determined by the size of the community to be served by a waste water treatment works (WWTW), and by the nature of the receiving environment. This Directive also requires treatment to ensure compliance with all other relevant EC directives, including the Bathing Water Directive. The Urban Waste Water Treatment (Scotland) Regulations 1994 implement this Directive in Scotland.

The **Water Framework Directive** will be the principal driver for water quality improvements in Scotland over the next decade and beyond. This Directive, approved in December 2000, defines a planning mechanism for delivering specified environmental objectives. It requires Member States to ensure attainment of 'good status' in coastal waters, estuaries, rivers, lochs and groundwater by 2015, through the implementation of River Basin Management Plans; the first of which must be finalised by 2009. The Water Framework Directive will replace seven existing directives and will provide the context within which other directives, including the Bathing Water Directive, will operate. As well as having implications for investment to reduce point source pollution, the legislation will also require controls to be put in place to minimise the impact of diffuse pollution sources.

Portobello West

2.3 Working with others

SEPA is committed to continual progress towards total compliance with the Bathing Water Directive's mandatory standards. This compliance is not something that SEPA can achieve on its own and SEPA will continue to work with all relevant organisations, the agricultural community and the public to attain its goal. Only by working in partnership can SEPA give the people of Scotland, and visitors, the high quality of bathing water that they are entitled to expect in the 21st century.

All large continuous sewage discharges to Scottish waters are now subject to at least full secondary treatment, however, sewage remains a significant cause of coastal waters pollution. Measures to reduce sewage-related problems are in most cases the responsibility of Scottish Water. SEPA and the Scottish Executive work with Scottish Water and the Water Industry Commissioner to ensure:

- that planned capital investment programmes, aimed at upgrading sewerage infrastructure throughout the country, are prioritised to maximise environmental benefits; and
- compliance with Regulations implementing the European Urban Waste Water Treatment Directive and all relevant quality standards.

Investment is required not only in sewage treatment but also in sewerage infrastructure, particularly in storm water overflows which continue to cause pollution problems in numerous catchments. At times of heavy rainfall, combined sewer overflows are necessary to prevent flooding. To do this, they have to discharge diluted but minimally treated sewage to watercourses and coastal waters. SEPA imposes conditions requiring solids removal and on the location and frequency of operation of combined sewer overflows to minimise their impact on water quality.

As sewage-related pollution sources are gradually eliminated, other sources of pollution become more apparent. The Scottish Executive's publication *Strategy for Improving Scotland's Bathing Waters*, published in March 2002, and subsequent development of the *Four Point Plan for Reduction of Agricultural Pollution Sources*, published in December 2002, are proving very helpful in enabling these problem sources to be tackled. This is particularly important, as many of these problems are not yet subject to statutory control.

In urban areas, the principles behind the successful Sustainable Urban Drainage Systems (SUDS) manual are increasingly limiting urban diffuse pollution from new developments, but there remains a large problem of contaminated surface water run-off from existing urban areas. It is encouraging that the Scottish Executive has undertaken an evaluation of retrofitting SUDS to urban areas near to bathing waters.[2]

Local authorities are responsible for keeping beaches identified as Amenity Beaches under the Environmental Protection Act 1990 free from litter. All identified bathing waters are now classed as Amenity Beaches. Local authorities are also obliged to display notice boards at identified bathing waters providing a variety of information including the water quality data supplied by SEPA.

2.4 Identification of bathing waters

The first set of 23 identified bathing waters in Scotland was established in 1987 and was based on the criteria set by the UK Government for identifying waters within the scope of the Directive, based on the number of people using the water for bathing. A review carried out in 1998 resulted in the addition of 37 bathing waters, bringing the total in Scotland to 60 (see Maps 1 and 2). These 60 waters are the focus of this report.

[2]www.scotland.gov.uk/topics/environment/water/1556/15068

In 2004, the Scottish Executive carried out a consultation on the standards which might be applied to the identification of bathing waters. This resulted in the formation of a panel, chaired by Clean Coast Scotland, which is responsible for making recommendations on any changes to the list of identified bathing waters. Further information on this review is available on the Scottish Executive's website. SEPA believes that the number of identified bathing waters should not be reduced, but that there may be scope for replacing some little used waters with others which have larger numbers of users. The recommendations of the panel are expected early in 2006, allowing a decision on any changes to be made well before the 2006 bathing season.

2.5 Revision of the Bathing Water Directive

Long-standing proposals for a substantially revised Bathing Waters Directive have made progress during 2005, and particularly since the UK took over presidency of the EU at the start of July. The proposed new standards, yet to be voted upon, are numerically substantially more stringent than those of the current Directive. It is proposed that the new standards should be demonstrably met by 2015: the date by which many other EU Water Framework quality objectives have also to be met.

The revised Directive also introduces a fourth quality category, which may be considered to detract from the simple concept of water either meeting a required standard or not. Waters will be classified as being of a quality that is 'excellent', 'good', 'sufficient' or 'poor'. Beyond 2015, the Directive anticipates the demise of the 'sufficient' category, with measures then having to be put in place to ensure the attainment of at least the 'good' quality standards.

There are also changes to the bacterial entities which must be monitored. These arise from recommendations of the World Health Organisation. In place of the current coliform and faecal streptococci standards, the revised directive sets standards for *Escherichia coli* and intestinal enterococci. While slightly complicating the microbiological analytical techniques that will have to be employed, the numeric differences are anticipated to be minimal.

One final difference is that quality assessment would be spread over four years, and sampling frequency would be lower. Sampling schedules would be published in advance of the bathing season, but there will be several days flexibility, potentially allowing sampling during very wet weather to be avoided.

It is also proposed that up to 15% of sample results may be discounted, provided that a public warning scheme to inform of potentially less good quality is in place. It is considered that SEPA's internet information and the signage scheme already in place at a limited number of sites in Scotland (see Section 4.3) will meet these requirements. The abnormal events provisions of the current directive will be maintained.

Fraserburgh

3 Bathing water quality 2005

3.1 Results from the 60 identified bathing waters in Scotland

In 2005, the number of bathing waters meeting the EU mandatory standards was 57 out of 60 (95%). The number of waters reaching the guideline standards was 33 (55%). The three failures (at Nairn East, Stonehaven and Eyemouth) were all in waters that had met the required standards last year, and they were rigorously investigated. In contrast to last year, when the main pollution sources causing failure were diffuse farming and urban sources, sewage sources were more strongly implicated in 2005. Details are given in Section 3.2.

Overall, the results for 2005 are the second best ever. While the lowest ever number of mandatory failures achieved in 2003 was equalled, the number of guideline passes achieved in that year was not. This is ascribed to the wetter weather of 2005 relative to the exceptionally dry conditions of 2003. It also emphasises the continuing significance of diffuse pollution as a primary source of low-level bacterial contamination of waters after significant rainfall.

Particularly noteworthy is the fact that this is the first year that all bathing waters on the west coast of Scotland have met the required mandatory standards specified by the Directive. This is a tangible reward for the ongoing efforts to reduce or eliminate diffuse pollution sources from the thousands of farms across Scotland that have been inspected by SEPA officers (see Section 4.2).

The 'reduced sampling' provision of the Directive (Annex 3.2), which was applied for the first time in 2004, was applied at the same sites in 2005. The outcome was also the same, with all of these sites maintaining their 'excellent' quality classification.

The full set of microbiological monitoring data from the 60 identified bathing waters in Scotland can be found in Annex 1 and is summarised below (see also Figure 1, and Maps 1 and 2):

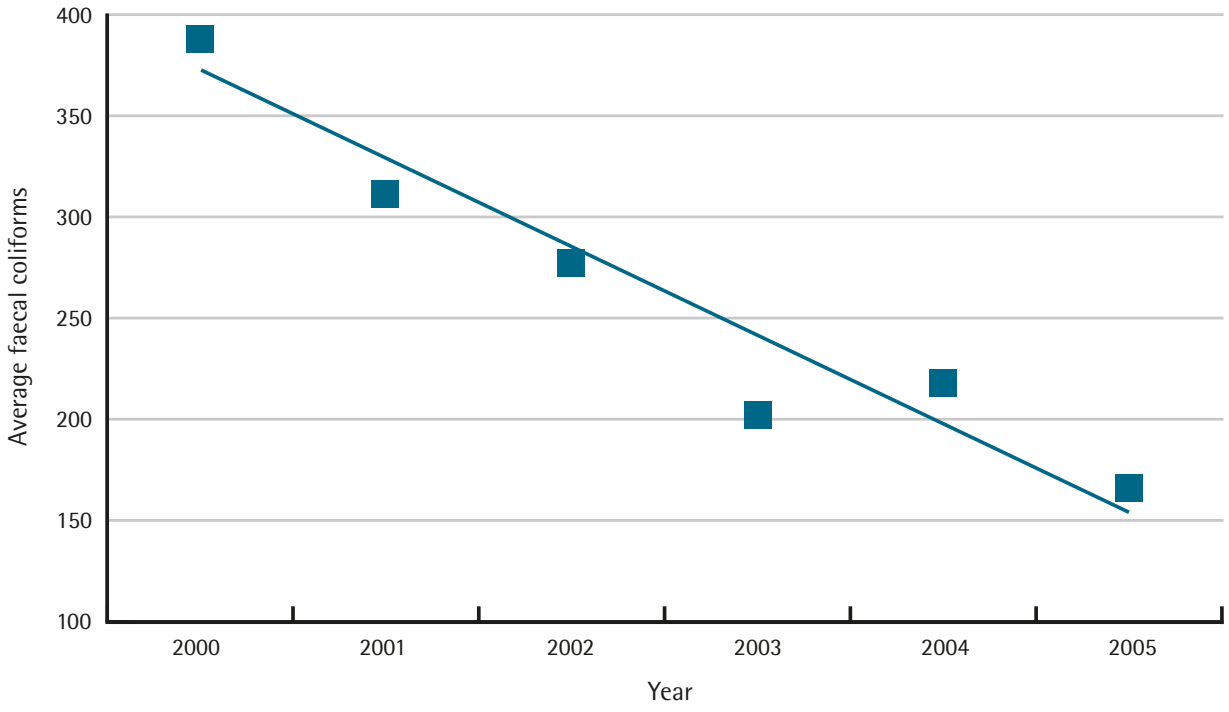
- 33 of the 60 identified bathing waters met the guideline quality standards of the directive and are of 'excellent' quality (55%);
- 24 of the 60 identified bathing waters met the mandatory coliform quality standards of the directive and are of 'good' quality (40%); and
- 3 of the 60 identified bathing waters failed the mandatory coliform quality standards of the directive and are of 'poor' quality (5%)

Figure 1: Scotland's 2005 bathing water results

While the number of waters meeting specific quality targets is a good measure of progress, it does not tell the whole story. Improvements continue to be made at waters that are already of good/excellent quality and the polluted samples that caused the 2005 failures were mostly isolated and out of character for the waters concerned, due to specific short-term problems.

The typical or average data for these sites was perhaps not as poor as from their classification might suggest. Stonehaven is the only site at which there is a more long term problem and this is due to a delay in building a pumping station. The ongoing improvements not brought out by the site classification data above may perhaps be best illustrated through the combined result of all samples taken during the season. Figure 2 below shows the average faecal coliform concentration for all samples taken from all identified waters each year since 2000. The wet weather of 2004 caused the average for that year to rise, but it is particularly encouraging that the average for 2005 is lower than that for 2003, despite the extremely dry summer enjoyed in 2003. This does demonstrate a continuing underlying improvement trend. The average concentration has fallen from 388 fc/100ml in 2000, to 166 fc/100ml in 2005.

Figure 2: Annual average faecal coliform concentration for all samples from all EU Bathing Waters, 2000–2005

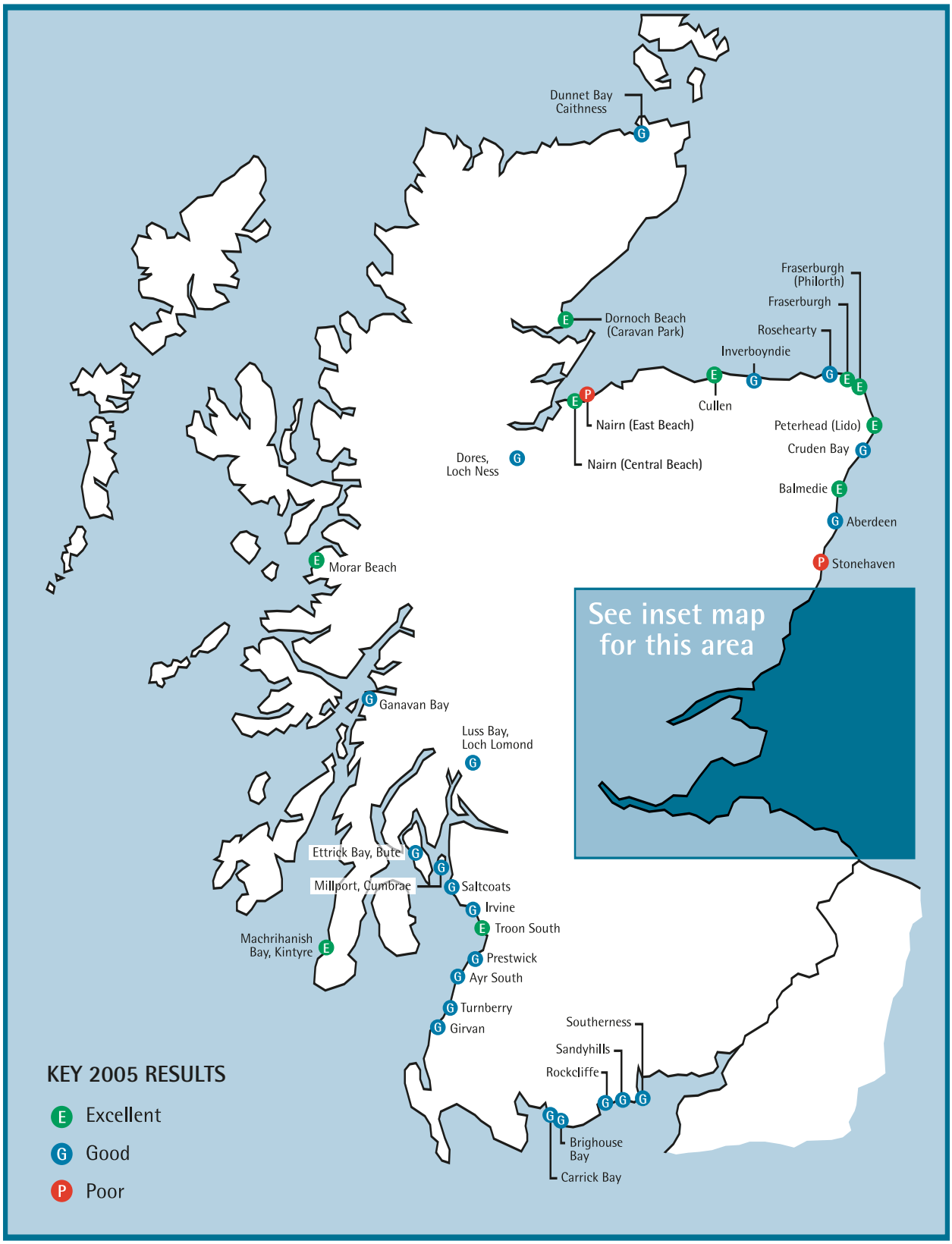


3.2 2005 information on Scotland's 60 identified bathing waters

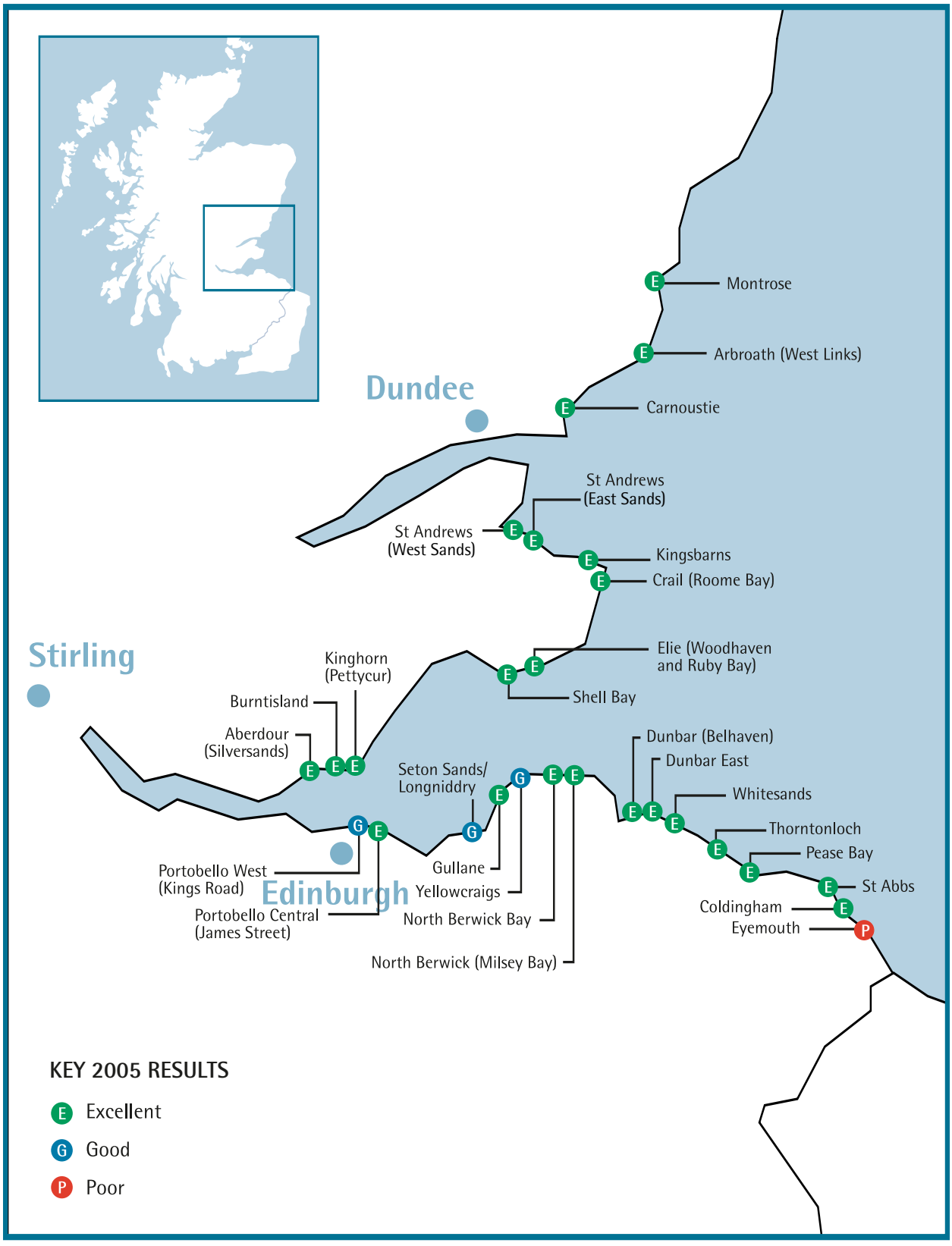
This section contains specific information for each of Scotland's identified waters. It also focuses on the underlying factors behind bathing water quality at each site and outlines the plans for improvements. Waters are described in clockwise order around Scotland, starting in the southwest.

In the following paragraphs: n/s indicates not sampled, good quality indicates a pass of the Directive's mandatory standards and excellent quality indicates a pass of the Directive's guideline quality standards.

Map 1: Results for Scotland's 60 identified bathing waters 2004



Map 2: Results for Scotland's 60 identified bathing waters 2004 (south east area)



Southerness

1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
n/s	n/s	n/s	n/s	Good	Good	Poor	Good	Good	Poor	Good

Southerness was identified as an EU Bathing water in 1999. In 2005, all samples passed at least the EU mandatory standards, with half of them meeting the more stringent guideline values.

The main threat to water quality is from sewage inputs especially from the town of Dumfries. In addition to the sources of sewage from Dumfries (Troqueer, Dalscone and Lincluden WWTW), there are a number of Scottish Water discharges from small communities along the Nith Estuary. The CSO in the Troqueer catchment of Dumfries were upgraded in 2005 to provide better screening and to reduce the frequency of overflows. However, there are still issues with overflow frequency at two CSO on the Troqueer network and premature overflows of settled sewage at Troqueer WWTW which require to be addressed. The only private waste water treatment plant is the settlement tanks at Southerness, which serve the caravan park and village. This discharge is due to be upgraded to full treatment before the end of 2005.

Sandyhills

1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Good	Good	Poor	Poor	Good	Poor	Poor	Good	Good	Good	Good

Sandyhills bathing water has had a varied history of compliance but again achieved good water quality in 2005.

The main threat to bathing water quality here is agricultural run-off, but joint exercises between the Scottish Executive, through a funded farm project and a farm inspection programme carried out by SEPA now appears to be reducing agricultural diffuse pollution. A project carried out by the SEERAD has included the introduction of composting facilities and Biogas plants to provide treatment of slurries and manures. These have received welcome positive feedback from the farming communities involved.

This bathing beach continues to be part of the SEPA electronic beach signage network, which provides daily predicted water quality information to bathers.

Rockcliffe

1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
n/s	n/s	n/s	n/s	Good	Poor	Good	Poor	Poor	Good	Good

Prior to its first identification in 1999, the bathing water at Rockcliffe had not been of consistently satisfactory quality. However, after local sewage treatment upgrading completed by Scottish Water before the 2004 bathing season, it has again complied with good quality requirements this year.

This second year of satisfactory water quality is encouraging. It suggests that the improvements made to local sewage treatment, involving the addition of ultraviolet (UV) disinfection and a storm storage tank, have contributed to bathing water quality improvement. In particular, the storm sewage tank will significantly reduce the storm sewage overflows during wet weather.

Brighouse Bay

1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
n/s	n/s	Good	Good	Good	Good	Good	Good	Poor	Good	Good

Brighouse Bay is a small sheltered sandy beach between long rocky outcrops. In 2005, this part of southwest Scotland largely escaped the wet conditions that plagued the rest of Scotland during the first 6 weeks of the bathing season.

With no significant sewage discharges into this catchment, there is little doubt that the occasional high bacterial counts in samples from this site are most likely due to agricultural run-off both from farm steadings and diffuse agricultural run-off. A project funded by the Scottish Executive was completed last year. This involved extensive fencing of watercourses and provision of alternative livestock watering points. Two farm wetlands were also introduced, this to reduce poaching (trampling) of riverbanks and faecal matter entering the Brighouse Burn.

It is not yet clear if the good overall water quality achieved again in Brighouse Bay owes more to the weather, or the extensive efforts to reduce agricultural sources of pollution. Probably both have contributed. As demonstrated in the past, this beach has been most contaminated immediately after heavy rainfall events. So, although this year's result is encouraging, given the unusually dry season experienced in this local area this year, some caution is necessary. It cannot yet be assumed that its problems have all been fixed.

This bathing beach continues to be part of the SEPA electronic beach signage network, which provides real-time predicted water quality to bathers.

Carrick Bay

1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
n/s	n/s	n/s	n/s	Good	Good	Good	Good	Excellent	Poor	Good

Carrick was identified as a bathing water in 1999, and has since had a rather variable quality record. This year it overall met required standards, although one quality standard exceedance early in the season was of concern.

As a result of the failure last year, the first in this water's history, a programme of farm inspections was carried out this summer. The conclusion of these inspections was that agricultural run-off from this catchment is unlikely to be the cause. As there are no major sewage inputs nearby, SEPA are considering further possible contributors to this failure. These include input from the heavily sea bird populated islands nearby, algal blooms or seaweed reducing bacterial die-off, or tidal influences carrying diffuse pollutants along the coast from the Cree Estuary.

Girvan

1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Poor	Poor	Poor	Poor	Good	Good	Good	Good	Good	Good	Good

Bathing water quality at Girvan has substantially improved since the successive phases of major new sewerage and sewage treatment schemes were completed during the 2001 season. There remain potential impacts during high river flows, but a seventh year of good quality was achieved in 2005.

Turnberry

1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Poor	Poor	Good	Poor	Poor	Good	Poor	Good	Good	Good	Good

Turnberry continues to achieve the 'good' quality standards required by the current EU Directive.

After the new sewerage scheme that connected Kirkoswald, Maidens and Turnberry to Girvan WWTW, there remain some private sewage effluent discharges at Turnberry. During 2005, Scottish Water has been installing new sewers as part of a scheme to provide first time sewerage for much of the village. This work is expected to be complete before the 2006 bathing season, and should contribute to the attainment of even better water quality.

Ayr South

1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Poor	Good	Poor	Poor	Poor	Poor	Poor	Good	Good	Good	Good

Ayr South bathing water was again of good quality in 2005. The town's sewage is now pumped to Meadowhead WWTW for full treatment including disinfection, before discharge via a long outfall. Diffuse pollution remains a concern. Investigations continue regarding potential pollution sources from urban drainage and a number of cross connections into surface water sewers have been identified in the town. Improvement measures have been taken at most farms in the river catchments.

Diffuse urban pollution remains a concern and weekly checks were carried out during the bathing season on surface water outfalls and sewer overflows in order to identify any pollution at an early stage.

As diffuse pollution can still be a problem, this bathing water was part of the electronic signage network, further details of which are given in section 4.4 of this report.

Prestwick

1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Good	Good	Good	Poor	Good	Good	Good	Good	Good	Good	Good

Prestwick again recorded good quality for the 2005 season.

The bathing water at Prestwick does not have a direct sewage outfall nearby, although there are storm overflows. Sewage from the town is pumped to Meadowhead WWTW for full treatment. Because of its past quality record, this bathing water is part of the SEPA electronic signage system.

During the season, one sample failed to comply with the mandatory bacterial limits. Investigations were carried out as soon as the preliminary analysis result was available, the day after sampling. Although the cause of the failure could not be conclusively established, SEPA discovered that a sewage pumping station at Prestwick Esplanade had failed. Operatives arriving for routine maintenance checks on the day of sampling discovered that the station was not operating, and sewage was overflowing into the coastal waters. The pumping station was immediately re-started.

Despite exhaustive enquiries, the cause of the pump failure remains unknown. A possible explanation is a brief interruption to the power supply. As a precautionary measure, Scottish Water instigated daily checks of the pumping station and the problem did not recur.

Troon South

1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Good	Good	Good	Good	Good	Poor	Good	Good	Excellent	Good	Excellent

After commissioning of the new Meadowhead WWTW, the bathing water at Troon was of excellent quality for the first time in 2003, although in 2004, due to wet weather that summer, this was unfortunately not sustained. However, it is encouraging to note that excellent status was again achieved in 2005.

These results confirm encouraging improvement trends, coincident with the increasing treatment given by Meadowhead WWTW.

This bathing water is part of the SEPA electronic beach signage network, further details of which are given in Section 4.4 of this report.

Irvine

1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Good	Good	Poor	Poor	Poor	Good	Good	Good	Good	Poor	Good

The bathing water at Irvine achieved good status in 2005.

The new biological treatment plant at Meadowhead WWTW and an extended sea outfall were completed and commissioned in 2002. Scottish Water is continuing investigations into the most effective improvement measures to reduce continuing intermittent storm overflow discharges into the Irvine catchment. In the meantime, 80% of farms in the River Irvine and River Garnock catchments where potential problems were identified by SEPA have started or completed remedial measures.

As there remains a continuing threat from diffuse pollution, this bathing water is part of the SEPA electronic beach signage network, further details of which are given in Section 4.4.

Prestwick

Saltcoats

1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Poor	Good	Poor	Poor	Good	Poor	Poor	Good	Good	Good	Good

Prior to 2001, Saltcoats had a poor history of bathing water quality, but encouragingly the waters achieved the good standard again in 2005.

This improvement is attributed mainly to the waste water treatment plant at Stevenston Point which was completed in 2002. However, the monitoring results sometimes show the vulnerability of the beach to high bacterial levels after rainfall. As elsewhere in Ayrshire, action plan work to reduce pollution from urban drainage and intermittent discharges continues.

As there is still a threat to quality from diffuse pollution sources, this bathing water is part of the SEPA electronic beach signage network, further details of which are given in Section 4.4.

Millport, Cumbrae

1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
n/s	n/s	n/s	n/s	Good	Good	Poor	Good	Good	Good	Good

The waters of Millport Bay were identified as a bathing water in 1999 and were once again classed as of good quality in 2005. However, the situation has changed dramatically from one of marginal compliance, to comfortable compliance with mandatory standards. The reason for this is that the old septic tanks serving Millport have at last been abandoned and all sewage is now intercepted and pumped to a new treatment plant which discharges outside the bathing area.

Luss Bay, Loch Lomond

1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
n/s	n/s	n/s	n/s	Good	Good	Good	Good	Good	Good	Good

Luss Bay was first identified as a bathing water in 1999. It has attained good quality standards every year, but sometimes not by a wide margin. This continued in 2005 when one sample exceeded the limit values

There is a small treated sewage discharge about 0.5 km to the south of the bathing water. The discharge has been subject to UV disinfection since 2004. However, because of the relatively marginal compliance in 2005, SEPA will undertake more detailed investigations next year.

Ettrick Bay, Bute

1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
n/s	n/s	n/s	n/s	Poor	Poor	Poor	Poor	Poor	Poor	Good

Ettrick Bay was identified as a bathing water in 1999 and for 6 years badly failed to meet the EU Directive's quality standards. This has changed dramatically in the 2005 season, with 17 mandatory passes, two guideline passes and only one exceedance being recorded, resulting in an overall mandatory pass for the year.

There are no significant sewage discharges in the vicinity of the beach, and the failure to meet required standards in previous seasons has been attributed solely to agricultural pollution, which reaches the bathing water via local streams that flow across the beach. The surrounding area is intensively farmed and high levels of bacteria have been found in the streams after heavy rainfall.

All farmers in the area have been encouraged to adopt practices that should lead to a reduction in bacterial pollution of the local streams. All of the farms in the catchment have been inspected as part of SEPA's agricultural pollution reduction programme. Remedial action was requested and implemented at a number of farms that were found to have a problem with excess surface water draining from contaminated yard areas. In addition, the Scottish Agricultural College has been carrying out advisory/assessment visits to all farms as part of a Scottish Executive project, and giving recommendations on what further remedial measures could be undertaken to reduce bacterial pollution.

As water quality is still predictably threatened by diffuse pollution, this bathing water remains part of the electronic signage project, further details of which are given in Section 4.4.

Machrihanish Bay, Kintyre

1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
n/s	n/s	n/s	n/s	Good	Good	Good	Good	Excellent	Excellent	Excellent

Machrihanish Bay was identified as an EU bathing water in 1999. Until 2003, it had achieved the 'good' quality standard. After diversion by pumping of sewage from the small communities of Machrihanish, Stewarton and Drumlemble to Campbeltown WWTW for full treatment, 'excellent' quality standards have now been met for the third successive year. Provided potential agricultural pollution sources in the area are kept under control, satisfactory quality should now be maintained.

Ganavan Bay (North of Oban)

1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
n/s	n/s	n/s	n/s	Good	Good	Good	Good	Good	Excellent	Good

Ganavan Bay was identified as a bathing water in 1999 and achieved good quality in 2005. A Scottish Water pumping station pumps sewage from the Ganavan public system to Oban for treatment at the WWTW prior to discharge into the Sound of Kerrera. This works, serving the resident population of Oban (9,000 rising to 20,000 in summer), discharges offshore into deep water approximately 2 km to the south of the bathing water, which is consequently well protected.

A discharge consent relating to a caravan site has been reviewed to require compliance with the microbiological standards set out in the bathing water directive. A former public toilet block has been closed and the discharge consent has been revoked (cancelled).

Morar Beach (Sound of Sleat at Morar Golf Course)

1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
n/s	n/s	n/s	n/s	Excellent	Good	Good	Excellent	Excellent	Excellent	Excellent

The 7-km stretch of the Morar coast, which was identified as a bathing water in 1999, continued this year to achieve excellent water quality. It has maintained its record of achieving excellent water quality since 2002. Suspected sources of agricultural and sewage pollution within the catchment area have been successfully addressed by SEPA in recent years.

In 2005, 17 out of the 20 samples met the Directive's guideline quality standards, but one sample gave a high result. Investigation of the cause of the abnormally high result could find no unusual activities taking place or reported in the area, and a resample showed that the poor condition was only temporary. Rainfall had not been significant, so could not have been the cause. The reason for this temporary poor quality therefore remains unknown – isolated bird or animal droppings on the beach can always be suspected.

Dunnet Bay (Caithness)

1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
n/s	Excellent	Excellent	Poor	Excellent	Good	Excellent	Good	Excellent	Excellent	Good

Dunnet Bay was identified as a bathing water in 1999. Good quality was recorded in 2005 and there have been no failures since 1998. The input of sewage from Castletown has previously affected the quality of the bathing water in Dunnet Bay. As part of ongoing investment to ensure water quality in the identified area is improved, Scottish Water will install a WWTW on a new site further from the bathing water in early 2006. This will remove this source of potential pollution. To ensure that bathing water quality is protected until that time, Scottish Water have installed a disinfection unit (using peracetic acid) on the discharge at Castletown as an interim measure.

The adequacy of the septic tanks serving the small settlement at Dunnet and a caravan park at the northern end of the bay are also under review. Again as a temporary measure, Scottish Water provided peracetic acid dosing to the Dunnet discharge during the 2005 season. After discussions with SEPA, a new disinfection holding tank was installed this year. This gives an improved 25-minute contact time between sewage effluent and disinfectant. The improved system was tested during the bathing season using on-the-spot microbiological analysis of the discharge from this tank. This showed that the upgraded system was reducing bacterial concentrations to a very low level.

Other potential pollution sources have been checked this year but no new sources found.

Dornoch Beach (Caravan Park)

1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Excellent	Good	Good	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent

Dornoch Beach was identified as a bathing water in 1999. Local sewage and potential agricultural sources of pollution have been progressively diminished, and in 2005, for the eighth consecutive year, it again achieved excellent quality. The beach continues to be a popular destination for visitors and locals who value the high standard of the bathing water.

Dores (Loch Ness)

1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
n/s	n/s	n/s	n/s	Good	Good	Good	Good	Good	Good	Good

An area of Loch Ness next to the village of Dores was identified as a bathing water in 1999. This is one of only two identified freshwater bathing waters in Scotland and it again achieved good quality this year.

Scottish Water extended the public sewerage system in the village in 2004, to pick up numerous septic tanks, which had previously been identified as a potential risk to water quality, and which discharged to either the Dores Burn or Loch Ness. SEPA continues to monitor the Dores Burn and are currently investigating the potential sources of high levels of faecal coliforms detected in the burn. However, these do not appear to be affecting the bathing water.

Nairn (Central Beach)

1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Poor	Good	Good	Good	Good	Excellent	Excellent	Good	Excellent	Good	Excellent

Nairn (Central Beach) was identified as a bathing water in 1999. To ensure that it would be adequately protected, SEPA required disinfection of the effluent from Nairn WWTW. The initially installed disinfection system was unreliable, and led SEPA to issue a Section 49A Enforcement Notice. This has led to the installation of a completely new replacement disinfection system. However, this year's effluent sampling results indicate that the effectiveness of disinfection at the works remains problematic.

Continuing bacterial loadings from the River Nairn are also considered sufficient to pose a risk to the bathing beaches at Nairn. Consequently, Scottish Water was issued with revised consents setting more stringent conditions on discharges from four WWTW on the River Nairn. These consents effectively require disinfection of the effluents prior to discharge. Disinfection systems have been installed at Sunnyside, Croy and Cawdor. However, issues remain with the discharge from Brackla Septic Tank and SEPA are currently taking the appropriate action to ensure consent compliance is achieved.

Nairn (East Beach)

1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Good	Good	Good	Poor	Good	Excellent	Good	Good	Excellent	Excellent	Fail

Nairn East has a pleasant and popular sandy beach. In recent years, it has had a good and improving quality record, but in 2005 two early season samples exceeded the mandatory quality standards. The usual underlying water quality remains very good, but may be temporarily influenced by unauthorised discharges and weather-related events. SEPA is currently investigating the impact of suspected unauthorised discharges on water quality.

It is occasionally influenced by water from the River Nairn, so the above comments for Nairn Central about this river are applicable also to Nairn East.

Nairn (Central Beach)

Cullen

1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Excellent	Good	Good	Good	Excellent	Excellent	Good	Excellent	Excellent	Good	Excellent

Cullen bathing water was of very good quality throughout the year and achieved excellent quality overall as there were only two instances when the guideline standards for faecal coliforms and faecal streptococci were not met. Weather was quite poor during June and it is likely that water quality was affected by heavy rain causing agricultural run-off into the Deskford Burn, which enters the sea near the monitoring point. In early July, one extreme rainfall event triggered the 'abnormal event' provision of the Directive, but subsequent samples that month showed immediate recovery.

Inverboyndie

1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Excellent	Good	Good	Good	Good	Excellent	Good	Good	Excellent	Excellent	Good

Inverboyndie was identified as a bathing water in 1999. The beach is a popular recreational area and attracts many walkers, swimmers, surfers and windsurfers. It achieved good bathing water quality in 2005.

Inverboyndie has benefited from substantial improvements to the surrounding sewerage system in recent years. A continuous discharge of untreated sewage at one end of the beach has been eliminated, and the sewage is now pumped to a treatment plant at Macduff where it undergoes full biological treatment followed by UV disinfection. The outfall itself has been retained only as a storm and emergency overflow for the pumping station. Investigation into the isolated mandatory exceedence in early July found that heavy rainfall caused this pumping station to overflow. The recorded rate of rainfall was such as to make it a 'less than once in 5 years' event, and the 'abnormal event' provision of the Directive was therefore applied.

Another potential impact on bathing water quality comes from the Inverboyndie Burn which discharges to the sea at the western end of the beach. All farms draining to this watercourse were inspected in 2003 in order to determine potential sources of bacterial contamination which could pollute the bathing water. All revisits to these farms have since been completed where necessary, and the response from the farming community has been encouraging. The majority of farms have carried out the measures previously identified as required to minimise agricultural pollution.

Rosehearty

1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Excellent	Excellent	n/s	n/s	Excellent	Good	Good	Good	Excellent	Good	Good

Adjacent to the village of Rosehearty, this beach is becoming more popular with wildlife enthusiasts after recent sightings of basking sharks and whales off the coast. Rosehearty was identified as a bathing water in 1999. It achieved good bathing water quality in 2005.

Sewage improvements in the area came to fruition in 2001, when sewage from the town was diverted to the new waste water treatment plant at Fraserburgh which has UV disinfection designed to protect bathing water quality. At Rosehearty there is now only a pumping station, which has consent to discharge screened sewage only under certain storm and emergency conditions. Several farm steadings draining to watercourses in the vicinity of Rosehearty were audited to assess potential pollution sources in 2003. However, it was concluded that they do not play a significant role in bathing water compliance.

Fraserburgh (Tigerhill)

1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Good	Good	Good	Poor	Good	Good	Poor	Good	Excellent	Good	Excellent

This sandy beach next to the town of Fraserburgh is a popular location for many watersports as well as for walking and family outings. The bathing water achieved excellent quality in 2005.

Significant upgrading of the local sewerage infrastructure was completed in 2001, with 12 previously untreated sewage outfalls being replaced by a full biological treatment plant with UV disinfection and a single outfall 3 km to the west of the bathing water. Bacteriological monitoring of the effluent has shown that the disinfection treatment is extremely effective.

The local Kessock Burn drains to the beach to the west of the monitoring point and remains a potential source of bacterial contamination. Audit inspections of farms in this catchment were carried out in 2003. The majority of these farms have since been revisited, and found to have complied with the improvement measures identified as required at the time of the initial visits.

Fraserburgh (Philorth)

1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Excellent	Good	Excellent	Good	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent

Fraserburgh (Philorth), which was identified as a bathing water in 1999, achieved excellent quality in 2005 for the seventh consecutive year. On account of its outstanding record, this beach has been selected for reduced monitoring (as prescribed by the EC Bathing Waters Directive), and was sampled only five times during the 2005 season. All samples met the EU 'guideline' quality standards. The beach is a popular recreational and windsurfing area, located at one end of the sandy bay that links Fraserburgh and Philorth. There are no sewage discharges in the immediate vicinity of the bathing water, and the Water of Philorth discharges some distance to the east of the monitoring point.

Peterhead Lido

1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Excellent	Good	Good	Good	Excellent	Excellent	Good	Poor	Excellent	Good	Excellent

Peterhead Lido is located within the outer harbour (Bay of Refuge) of the town of Peterhead. This bathing water attracts a diverse range of water sports enthusiasts, with dinghy sailing in the sheltered waters of the bay particularly popular. Despite a single mandatory exceedence, believed to have been linked to storm sewage discharges as a result of localised heavy rainfall, Peterhead Lido achieved excellent bathing water quality in 2005, continuing a generally good compliance record at this bathing water.

Improvements to the sewerage infrastructure were completed prior to the 2003 season, and include increased storage capacity at the main pumping station and a better telemetry system. Discharges from the pumping station are now only permitted under emergency or storm conditions, with the consent conditions designed to protect the bathing water.

Cruden Bay

1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Good	Good	Poor	Poor	Good	Poor	Good	Poor	Good	Good	Good

This extensive sandy beach, situated next to the small village of Cruden Bay, achieved good bathing water quality in 2005. The bathing water has shown a marked improvement in compliance since sewerage improvement plans came into effect prior to the 2003 season. An unsatisfactory short outfall was removed and sewage from the village is now pumped to the WWTW at Peterhead, with the former outfall retained only as a storm and emergency overflow.

The Water of Cruden flows into the sea at one end of the bathing water and, as well as draining an agricultural catchment, receives treated sewage effluent from both a waste water treatment works serving the village of Hatton and a large septic tank at Bridgend. Ultra-violet disinfection at Hatton WWTW and removal of the septic tank discharge are due to be delivered prior to the start of the 2006 bathing water season.

Over 60 farms in the catchment were visited in 2003 as part of a national plan to determine potential sources of bathing water pollution. Revisits to the majority of these farms have been completed and compliance with the measures outlined after the initial visits has been satisfactorily demonstrated in most cases.

Peterhead Lido

Balmedie (Pillbox)

1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Excellent	Good	Good	Good	Excellent	Good	Good	Good	Excellent	Excellent	Excellent

This popular expanse of sandy beach is adjacent to Balmedie Country Park, approximately 7 miles north of Aberdeen. It was identified as a bathing water in 1999, and in 2005 achieved excellent water quality for the third successive year. Bathing water quality in recent years has benefited from the installation of a new waste water treatment plant at Balmedie, which was commissioned prior to the 2004 bathing season and now also collects and treats sewage pumped from the nearby village of Newburgh.

Farm audits of premises in the Balmedie area carried out during the 2003 season revealed a number of minor problems which resulted in several follow-up inspections in 2004. Agricultural pollution is not now considered to have a significant effect on bathing water quality at this location.

Aberdeen Ballroom

1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Good	Excellent	Good	Good	Excellent	Good	Good	Good	Good	Good	Good

Aberdeen has an extensive sandy beach, which is well used for water sports and sea bathing. The bathing water again achieved good quality in 2005. Continued reduction in the bacterial loading to the River Don is provided at Persley WWTW, where the final effluent is treated by UV disinfection. Prior to the 2003 bathing season, work was undertaken on the Kings Links combined sewer overflow (CSO) to ensure that the number of overflows met the requirement of a maximum of three spills per season.

Other improvements to the sewerage network have seen the installation of two mechanical screens, two static screens and seven event recorders. Five other sewer overflows have been eliminated. Electronic signage is provided near the Aberdeen Ballroom to advise bathers of current predicted water quality. Scottish Water is undertaking work on a drainage area plan for the city. This will identify further improvements to the drainage network and remaining CSO, which are required to increase the quality of effluent discharging to the streams and rivers in the vicinity of the bathing waters. The drainage study will ensure that pollution control measures are targeted effectively.

Stonehaven Carron

1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Good	Excellent	n/s	Poor	Poor	Good	Good	Good	Good	Good	Poor

Stonehaven is an increasingly popular coastal resort, which is well used by water sports enthusiasts. It was identified as a bathing water in 1999 but had been monitored since the 1980's. Disappointingly, after several years of good quality, and despite part-time disinfection of the final effluent, Stonehaven failed to meet the mandatory standards required by the Directive in 2005, recording two mandatory standard exceedances in the early part of the season.

In order to comply with the Urban Waste Water Treatment Directive, improvements to the local public sewerage infrastructure were planned to take place by 2004. Sewage effluent from Stonehaven was to be pumped to the main Aberdeen treatment plant and long sea outfall at Nigg Bay. However, serious delays have occurred as Scottish Water has failed to secure planning permission for the pumping station required. A Public Inquiry into the issues surrounding the planned proposals was held in August 2005. No decision has been announced to date. It now seems unlikely that the new facilities will be in place ahead of the 2007 bathing waters season. In order to provide some protection of the bathing waters prior to the completion of the connection to Nigg, Scottish Water will continue to disinfect the sewage effluent discharged via the Stonehaven outfall on incoming tides during the bathing water season. The disinfection, using hypochlorite solution, is not carried out on the ebb tide, as this could prevent salmon from running up the adjacent rivers.

Montrose

1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Good	Good	Excellent	Poor	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent

The bathing water at Montrose has consistently achieved European guideline quality standards since 1999.

The commissioning of Montrose WWTW and associated works in January 2002 should ensure that this high quality is maintained. The treatment plant and few remaining storm overflows (which include storm storage and screening) were all designed to be compatible with the attainment of the Directive's most stringent guideline quality standards.

Arbroath (West Links)

1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Good	Good	Good	Good	Good	Good	Excellent	Poor	Good	Excellent	Excellent

The identified bathing water at Arbroath (West Links) met the EU guideline standards in 2005. The substantial improvement since the 1990's is ascribed to the pumping of local sewage to Hatton WWTW, which was commissioned in 2001. SEPA required that this works was designed to ensure that the Bathing Water Directive's 'guideline' quality standards would be met at Arbroath (West Links).

The disappointing failure in 2002 was tentatively ascribed to unplanned CSO discharges. Possible sources were investigated and freshwater inputs close to the bathing water were all monitored in conjunction with the bathing water during 2003-4. With better Scottish Water maintenance procedures by then in place, these sources were all clean, so in 2005 monitoring effort was directed elsewhere and high bathing water quality has been maintained.

Carnoustie

1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Good	Good	Good	Good	Excellent	Excellent	Excellent	Good	Excellent	Excellent	Excellent

Carnoustie again met EU guideline quality standards in 2005. All normal sewage flows from the Carnoustie catchment are pumped to the Hatton WWTW for full treatment. SEPA required that this works was designed to ensure that 'guideline' quality standards are met at Carnoustie.

The apparent drop in bathing water quality in 2002 was thought to be due to contamination from local surface water inputs, which were affected by increased rainfall. Continuing investigations since 2002 have identified a number of potential problems with surface water drains, sewer overflows and possibly sewer leakage to the Lochty Burn, which outflows close to the bathing water sampling site. A number of small sewage sources have been identified, and several of these have been diverted to sewer when found. However, the complexity and age of the system requires continued vigilance and investigative effort to ensure that compliance is maintained.

St Andrews (West Sands)

1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Excellent	Excellent	Excellent	Good	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent

St Andrews (West Sands) has a good record of compliance with EU standards and has achieved excellent quality in 11 of the past 12 years. This bathing water also holds a 'Blue Flag' quality award.

The WWTW at Kinkell Ness, to which all sewage from St Andrews is pumped, was commissioned in 2001. This works has tertiary treatment including disinfection, and the treated effluent is discharged via a long sea outfall. Storm tanks have since been constructed in the Kinness Burn sewer catchment to minimise discharges from storm sewer overflows. The works consistently meets its discharge consent conditions, which should ensure continuing excellent bathing water quality.

St Andrews (East Sands)

1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Good	Good	Excellent	Good	Poor	Good	Good	Good	Excellent	Excellent	Excellent

This bathing water was identified in 1999, although SEPA and its predecessor had monitored it for many years. Since 2003, it has achieved the European guideline bathing water quality standards. The new works described earlier for St Andrews (West Sands) reduces the risk of bathing water non-compliance at both of the St Andrews bathing waters. This bathing water also holds a 'Blue Flag' award.

Kingsbarns

1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Good	Good	Good	Good	Excellent	Good	Poor	Excellent	Excellent	Excellent	Excellent

Kingsbarns was identified as a bathing water in 1999. It met the EU guideline standards for the fourth year running in 2005.

Kingsbarns has a small WWTW with effluent discharging via a short outfall to the north of the bathing water. The reason for poor quality in 2001 was thought to be an unusual combination of weather and tidal conditions directing the effluent plume into the bathing water. To ensure compliance in 2002, Scottish Water added chemical disinfection as an interim measure and increased the length of the outfall. Completion of the required new treatment works was delayed several times, but it will now be completed by the end of 2005. The new works will be a submerged aerated media system, followed by sand filtration and UV disinfection of the final effluent during the bathing season. This tertiary treatment will ensure continuing excellent water quality.

Crail (Roome Bay)

1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Excellent	Excellent	Good	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent

First identified as a bathing water in 1999, Crail (Roome Bay) has achieved excellent bathing water quality since that time. All local sewage sources are pumped to a WWTW at Kilminning, which provides adequate protection of these waters.

Kingsbarn

Elie (Woodhaven and Ruby Bay)

1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
n/s	n/s	n/s	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent

Elie (Woodhaven and Ruby Bay) was formally identified as a bathing water in 1999, although SEPA began monitoring in 1998. In each year, the bathing water has achieved excellent quality. The Elie Harbour beach is managed, and holds a 'Blue Flag' award.

Shell Bay

1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Excellent	Good	Good	Good	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent

The Shell Bay bathing water, just west of Earlsferry, was officially identified in 1999, and has achieved guideline quality classifications since that time.

Shell Bay is a small private beach that is managed by the adjoining holiday caravan park. The aesthetic appearance of Shell Bay Beach was often blighted by sewage-related debris, most of which was thought to be derived from beyond the Shell Bay area. The aesthetic quality could be vastly improved at this beach by improved beach cleaning. Much of the problem with sewage debris is caused by re-circulating debris that has been lying on the beach strand line, for several weeks in some instances.

The provision of sewage treatment to European Urban Waste Water Treatment Directive (UWWTD) standards at Levenmouth has markedly reduced the input of sewage debris to this part of the Forth. The Levenmouth works also provides disinfection of the treated sewage effluent during the bathing season.

Kinghorn (Pettycur)

1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Good	Good	Good	Poor	Good	Excellent	Good	Good	Excellent	Excellent	Excellent

In 2005, Kinghorn (Pettycur) bathing water achieved excellent quality for the third consecutive year.

New treatment facilities and a long sea outfall pipe at Pettycur were commissioned early in 1993. During 2001, the scheme was extended to treat and discharge all of Kinghorn's sewage through this system. This has resulted in much improved water quality being achieved at Kinghorn's other beach, Kinghorn Harbour, although as yet excellent quality has not been attained there. Prior to the 2006 bathing season, some investigations to determine the reason for this are planned.

Burntisland

1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Poor	Poor	Poor	Poor	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent

Burntisland is another of the bathing waters identified in 1999. Before that year, untreated sewage was discharged via several short outfalls, causing gross pollution.

Since then, Scottish Water has completed a prolonged series of improvements started by the former Fife Regional Council. Flows from several unsatisfactory outfalls have been diverted to a new WWTW, before discharge via a long sea outfall. The unsatisfactory discharge from Lammerlaws was diverted to this works at the end of 1998, and satisfactory water quality has been attained since that time. A new Lochies Road pumping station scheme was completed early in 2003. This removed the discharge that immediately threatened the bathing water. The Harbour outfall and a few other small outfalls were intercepted and connected into the main sewers prior to the 2004 bathing season, and this should ensue that guideline quality standards continue to be attained.

In 2005, Burntisland maintained its excellent bathing water quality for the seventh consecutive year. Burntisland beach is well managed and holds a 'Blue Flag' award.

Aberdour (Silversands)

1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Excellent	Good	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent

The very popular bathing water at Aberdour (Silversands) has achieved excellent quality for the past 9 years and holds a 'Blue Flag' award. The diversion of Dalgety Bay sewage by means of a pumping station and rising main to Dunfermline WWTW was completed in spring 2003, removing that distant potential risk to bathing water quality.

Portobello West (Kings Road)

1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Good	Good	Poor	Good	Good	Poor	Good	Good	Good	Good	Good

Portobello West (Kings Road) was identified as a bathing water in 1999. In 2004, it was again of good quality.

Bathing water quality at this site has been successively improved over many years by progressive improvement of sewage treatment and sewerage infrastructure. Edinburgh's WWTW has effluent disinfection and does not threaten water quality. The remaining water quality threats are from the local Figgate Burn, and potentially contaminated surface water run-off from adjacent urban areas.

A joint SEPA/Scottish Water workgroup was set up in 1998 to determine the impact of storm overflows and other inputs to the Figgate Burn, with a view to reducing these sources. A programme of CSO upgrading was carried out to reduce spill frequency. Several other sources of faecal contamination to the burn were identified and removed. This resulted in improved sanitary quality in the Figgate Burn, with a parallel improvement in bathing water quality at Portobello West as measured by the percentage of samples meeting the EU guideline standard for faecal coliforms. Other work to find sources of surface water run-off contamination is continuing.

Gullane

Portobello Central (James Street)

1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
n/s	n/s	n/s	Good	Good	Good	Excellent	Excellent	Excellent	Excellent	Excellent

Portobello Central (James Street) became an EU identified bathing water in 1999.

After a sewer overflow in May 2000, the water authority carried out investigative work on the Joppa sewer. This resulted in removal of debris from the sewer, increasing the flow passing on to Seafield and reducing the frequency of overflows at Joppa.

These and other improvements by Scottish Water reduced the occurrence of storm sewage overflows. This bathing water then met the EU bathing water guideline quality standards for the first time in 2001 and has maintained this excellent standard since that time.

Although the threat from diffuse pollution is relatively slight, this bathing water was part of the electronic signage pilot project in 2004, further details of which are given in Section 4.4 of this report.

Seton Sands/Longniddry

1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
n/s	n/s	n/s	n/s	Good	Good	Good	Good	Excellent	Excellent	Good

Seton Sands/Longniddry was identified as a bathing water in 1999. Between 1999 and 2002 it achieved good quality and in 2003, for the first time, Seton Sands achieved excellent quality. In 2004 this excellent bathing water quality was maintained, but not, disappointingly in 2005 when good quality was achieved. This apparent drop in quality will be investigated prior to the 2006 bathing season.

The reason behind this marked improvement is work completed at the end of 2002 to connect over 40 houses in the Seton Mains community to the main sewerage system, which conveys effluent to Edinburgh WWTW. Part of the cost of this work was borne by the residents. Other work to eliminate overflows from dual manholes in the nearby Canty Burn catchment is continuing.

In 2002, a new interceptor sewer was laid to convey the sewage from Longniddry to Edinburgh WWTW. The existing WWTW at Longniddry has now become a storm treatment works with a design overflow spill frequency of only once per 5 years. The impact of this improvement is best measured by the fact that the bathing water at Longniddry Bents met the excellent quality standard for the first time in 2004, despite the wet weather that year. Separate monitoring at Longniddry showed that it was again of excellent quality in 2005.

Gullane

1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent

The very popular and picturesque bathing water at Gullane has achieved excellent quality status every year since 1995.

The high quality of the bathing water at Gullane is due to the effective local WWTW, and the fact that storm overflows are located well away from the bathing water area. Work was completed early in 2004 to build a new long sea outfall and to extend the existing outfall for the discharge of storm sewage which will provide further protection of the bathing waters in this area.

Yellowcraigs

1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Good	Good	Good	Good	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Good

The identified bathing water at Yellowcraigs achieved excellent quality for six consecutive years up until 2004, so it was very disappointing that there was an apparent drop in bathing water quality to good in 2005. Investigations have taken place and potential causes have been identified, though as yet none of these has been confirmed. A more detailed investigation is planned prior to the 2006 bathing season. The improvement in quality in 1999 followed diversion of sewage from Dirleton to the WWTW and long sea outfall to the east of North Berwick. Prior to this it had discharged at the western end of Broad Sands Bay.

North Berwick Bay

1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Good	Good	Poor	Good	Good	Good	Excellent	Excellent	Excellent	Good	Excellent

SEPA and its predecessor have sampled North Berwick Bay since the 1970s, though 1999 was North Berwick Bay's first year as an identified bathing water.

Prior to 1995, when the North Berwick WWTW scheme was completed [see text for North Berwick (Milsey Bay)], North Berwick Bay frequently failed to meet required quality standards. While bathing water quality improved markedly after this date, there have still been occasional problems with the sewage collection and treatment infrastructure. The reason for the slight reduction in quality in 2004 was probably related to a local sewage contamination incident, which was revealed and tracked down by SEPA's monitoring work. Remedial action promptly taken by Scottish Water should ensure this does not recur, and in 2005 North Berwick Bay achieved excellent status.

North Berwick (Milsey Bay)

1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Good	Good	Good	Good	Good	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent

The identified bathing water at North Berwick (Milsey Bay) has achieved excellent quality since 2000. Bathing water quality greatly improved after the commissioning of the WWTW and long sea outfall in 1995, although SEPA was disappointed that the guideline values were not achieved until after 1999.

Investigative surveys by SEPA prior to the 2000 bathing season identified two significant sewage sources that could affect water quality at Milsey Bay. These were brought to the attention of Scottish Water for remediation. As a consequence, in 2000, North Berwick (Milsey Bay) achieved a guideline pass for the first time. To further highlight the improvement in bathing water quality, this very high standard has been maintained since then.

In the early part of the 2004 bathing season, elevated bacterial levels were observed in the Milsey Bay bathing water. SEPA investigative sampling found a slight discharge from the WWTW high-level overflow. Scottish Water found this to be a result of faulty bleed valve seals. As a result of SEPA investigations remedial action was carried out to remedy the situation and thus ensured that guideline water quality was maintained. The same problem had also occurred in 2002. To prevent recurrence, any future leaks are now returned to the inlet rather than to the overflow channel. These leaks and discharges illustrate the need for ongoing vigilance. This is particularly true with bathing waters that have freshwater inputs and storm sewage infrastructure nearby.

North Berwick Bay

Dunbar (Belhaven)

1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent

Dunbar (Belhaven) has a fine sandy beach, and the identified bathing water has achieved excellent status every year since 1993.

The current West Barns WWTW and long sea outfall were commissioned in 1993. Since then, the bathing water has consistently achieved EU guideline quality standards. However, the WWTW and outfall have suffered frequent short circuiting with the result that untreated sewage can be discharged via the old West Barns outfall and storm overflow. SEPA has required Scottish Water to eliminate this source of pollution. Consent for a new treatment works has been issued which requires Scottish Water to replace the current West Barns WWTW by the end of 2005, but this deadline will not now be met. The new works will be built inland with a discharge to the Biel Water utilising the existing long sea outfall as a storm overflow. SEPA will require the new discharge to meet appropriately high standards which will further safeguard the achievement of high bathing water quality.

Dunbar East

1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Poor	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent

Dunbar East was identified as a bathing water in 1999, although it had been monitored by SEPA and its predecessors for many years before this.

The sewage treatment facilities and planned improvements for Dunbar are described in the Dunbar (Belhaven) section. In 2005, Dunbar East again achieved the EU guideline standard for bathing water quality as it has done every year since sewage from the east side of Dunbar was diverted to the West Barns WWTW 10 years ago.

Whitesands

1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Good	Excellent

Whitesands achieved excellent status each year from 1988 to 2003, although it was only prior to the 1999 season that it was formally identified as a bathing water.

Disappointingly, Whitesands only achieved good status in 2004, failing to meet excellent by the narrowest of margins. This was possibly a result of the wet weather increasing local surface water contamination. This site is remote from any significant sewage inputs. In 2005, excellent status was restored.

Whitesands is a shallow enclosed bay, protected from the effects of strong waves and currents by the rocky outcrops at each end. These rock outcrops may also restrict the turnover of water when the tide is receding.

Thorntonloch

1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent

The identified bathing water at Thorntonloch has achieved guideline passes each year since 1988, although it was only identified as a bathing water under the Directive prior to the 1999 bathing season. This bathing water is consistently of excellent quality, though strong tidal currents are present, particularly at the west side of the bay during certain tide and wind combinations.

This year, as in 2004, in view of its consistently excellent status, the frequency of monitoring was reduced, as permitted by the Directive, from 20 samples a year to five. Four of the 5 samples taken met the Directive's guideline quality standards, so overall excellent status was maintained.

Pease Bay

1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Good	Excellent	Good	Good	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent

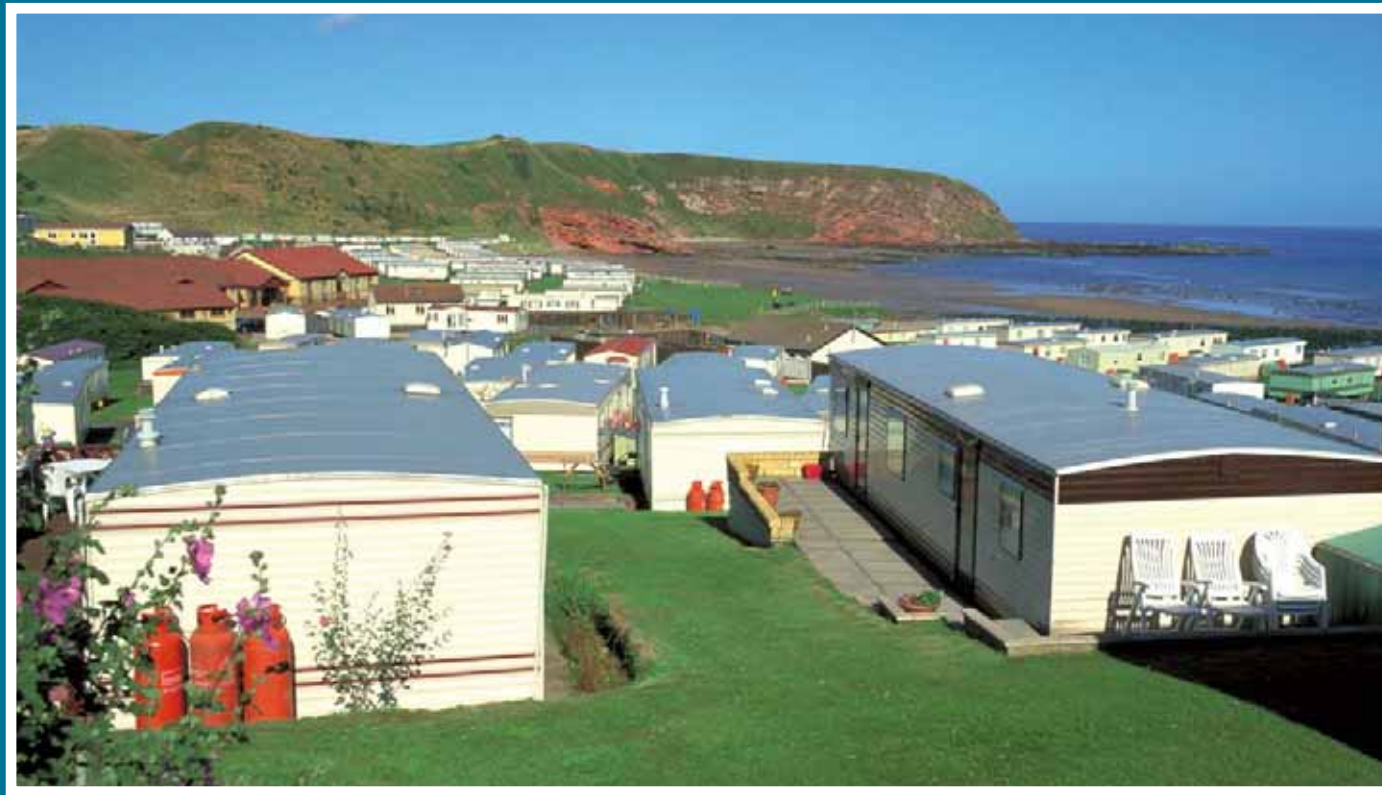
The identified bathing water at Pease Bay has achieved at least good quality each year since 1988, and excellent quality since 1999.

The sewage effluent from a treatment plant serving a nearby caravan site on The Bents enters Pease Bay to the south east of the bathing water. The discharge from this plant is controlled by a lunar clock and occurs over a 4-hour period (2 hours either side of the high tide) between 2100 hours and 0700 hours. This ensures that the discharge is made at night, and when maximum dilution is available. SEPA is currently in discussions with the caravan park operator regarding the possibility of upgrading the level of treatment provided to the sewage effluent before it is discharged.

The sewage effluent from Cockburnspath (1.5 km inland) is pumped to a WWTW at Cove Village, where it receives full treatment, prior to discharge to the North Sea about 1.5 km north of the bathing water. During the bathing season, the effluent from the WWTW is disinfected prior to discharge.

In 2003, SEPA undertook a programme of inspections of discharges to bathing water catchments from farm steadings. Six farms in the Pease Bay catchment were inspected to assess volumes of waste produced, examine storage facilities and discuss possible improvements to prevent future problems. Five of the farms were found to comply with the Silage, Slurry and Agricultural Fuel Oil Storage Regulations (SSAFO) and the 'Code of Good Practice for the Prevention of Environmental Pollution from Agricultural Activity' (PEPFAA Code) and therefore represented little risk to bathing water quality. Improvements were made at one farm.

This year, as in 2004, in view of its consistently excellent status, the frequency of testing was reduced, as permitted by the EU, from 20 visits a year to five. All samples met the tightest EU guideline standards.



Pease Bay

St Abbs

St Abbs

1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
n/s	n/s	n/s	n/s	Good	Good	Good	Excellent	Excellent	Excellent	Excellent

St Abbs was identified as a bathing water in 1999, having never previously been sampled by SEPA. St Abbs was identified because of its water sports usage, particularly scuba diving. It should be noted that there is no safe or explicitly permitted bathing area at St Abbs. For the fourth year in succession, St Abbs has attained excellent status.

Until 2004, sewage from St Abbs was discharged to the North Sea via four outfalls. There were also a few untreated sewage discharges, although these were small, some serving individual households. In March 2004, Scottish Water completed a programme of work to collect most of the sewage from St Abbs and pump it to the WWTW at Eyemouth where it now receives full treatment before being discharged to the North Sea.

Coldingham

1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Good	Excellent	Excellent	Excellent	Excellent	Good	Excellent	Excellent	Excellent	Excellent	Excellent

Coldingham, a very popular bathing and surfing beach, was identified as a bathing water in 1999, although it was monitored previously by SEPA and its predecessor. Excellent quality has been achieved each year since 1996 except for 2000, when several samples taken during or after heavy rain reduced it to good status.

Until 2004, comminuted sewage from Coldingham was discharged south east of the bathing area. There was also a small septic tank discharge at the northern edge of the bay. Occasional poorer bacteriological results at Coldingham showed that these two discharges posed a threat to water quality. In March 2004, Scottish Water completed a programme of work to collect sewage from Coldingham and pump it all on to the WWTW at Eyemouth where it now receives full treatment before being discharged to the North Sea.

Eyemouth

1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Good	Poor	Good	Poor	Poor	Poor	Good	Good	Good	Good	Poor

Eyemouth was identified as a bathing water in 1999. It failed to meet the mandatory standards between 1998 and 2000, but between 2001 and 2004, it just met required standards although numerous results suggested continuing sources of faecal contamination. Since 2004, sewage from Eyemouth, along with that pumped from St Abbs and Coldingham is fully treated in a WWTW and discharged to the North Sea through a long sea outfall well south of the bathing water.

In 2005, Eyemouth failed to meet the mandatory standard. The two samples that exceeded the required standards both followed heavy rainfall. The Eye Water was observed to be high flowing and turbid at the time these polluted samples were taken. A sample taken from the Eye Water during one of these occasions was found to contain exceptionally high faecal indicator organisms, strongly implicating the river as the cause of the bathing water pollution. SEPA has carried out investigations into the sources of this pollution. The Eye Water appears to be affected by:

1) storm overflows that discharge from Eyemouth's sewer network to the Eye Water and harbour during wet weather;

2) run off from agricultural grazing land in the Eye catchment during wet weather (there has been some shift from arable to beef farming in the area, after EU CAP changes); and

3) livestock having direct access to the Eye Water and its tributaries. SEPA will be working to reduce these sources. The sewage discharge from Ayton WWTW, approximately 5 km upstream of Eyemouth, is also a significant source of faecal contamination. This discharge will be removed from the Eye Water by pumping to Eyemouth WWTW by the end of 2005.

The North Burn, a largely culverted watercourse which runs through Eyemouth and discharges into the bathing water, has also been found to be contaminated with sewage. SEPA and Scottish Water have carried out investigations into the sources of this contamination, which can be very high at times. To reduce pollution, Scottish Water has removed identified problem sources to the foul sewer system. Provision of first time sewerage for two septic tanks discharging to the North burn at Acredale was not included in the current Scottish Water investment programme. However, these two septic tanks have now been connected to the sewer by the developer of an adjacent site. Although a lot of sources have been removed, continuing high bacterial indicator levels in the North Burn suggest that there is still further work to be done.

In 2003, SEPA undertook a programme of inspections of discharges to bathing water catchments from farm steadings. SEPA inspected 46 farms in the Eye Water catchment, to assess volumes of waste produced on the farms, examine storage facilities and discuss possible improvements to prevent future problems. Thirty-seven of the farms were found to comply with the Silage, Slurry and Agricultural Fuel Oil Storage Regulations (SSAFO) and the 'Code of Good Practice for the Prevention of Environmental Pollution from Agricultural Activity' (PEPFAA Code) and were of little risk to the bathing water quality. Improvements were made at seven farms.

3.3 Abnormal weather

Despite the prevailing wet conditions during the first 6 weeks of the bathing season, the rainfall came in mostly 'steady' rather than 'extreme' doses. The "abnormal weather" provisions of the Directive (see Annex 3.1) had to be invoked only once. This was for a geographically limited extreme rainfall event around the Elgin area on the 6/7 July, which caused SEPA's local flood monitoring service to swing into operation. Results of just one sample each from Cullen and Inverboyndie were discarded and resampling undertaken. This discard and resampling had no effect on the overall classification of either site. Perhaps unfortunately, there was insufficient evidence that the extreme weather event had extended as far west as the River Nairn catchment, as the Nairn East sample taken that day also exceeded the quality standard. This, added to the earlier exceedance there in dryer weather, led to overall failure for the season.

3.4 Results from other coastal and inland waters

During the 2005 bathing waters season, SEPA monitored 46 other coastal, estuarine and inland sites for bacterial water quality. The locations of these waters are shown in Maps 3 and 4.

The purpose of this additional monitoring varies. In some cases, the monitoring was instigated to review the need for discharge improvement and in these cases, when the required works are in place, the monitoring can be deleted. In other cases, the local authority has requested monitoring in order to get the monitoring data necessary for a beach to apply for a 'Keep Scotland Beautiful' beach award, which requires that EU bacterial standards are shown to be met. It is intended that after the outcome of the current review of bathing waters, the list of 'other waters' monitored will again be reviewed to reduce their number, so that resource can be freed up to undertake more investigative microbiological monitoring work at identified bathing waters, especially any which may be newly added for 2006.

Leven East

Although these waters are not identified bathing waters, SEPA assesses the monitoring results from these sites in the same way, as compliance with the quality standards of the bathing waters directive is also part of our overall coastal waters quality classification scheme. Therefore, to be of 'excellent' or 'good' quality these waters must meet the guideline or mandatory standards of the bathing waters directive, respectively.

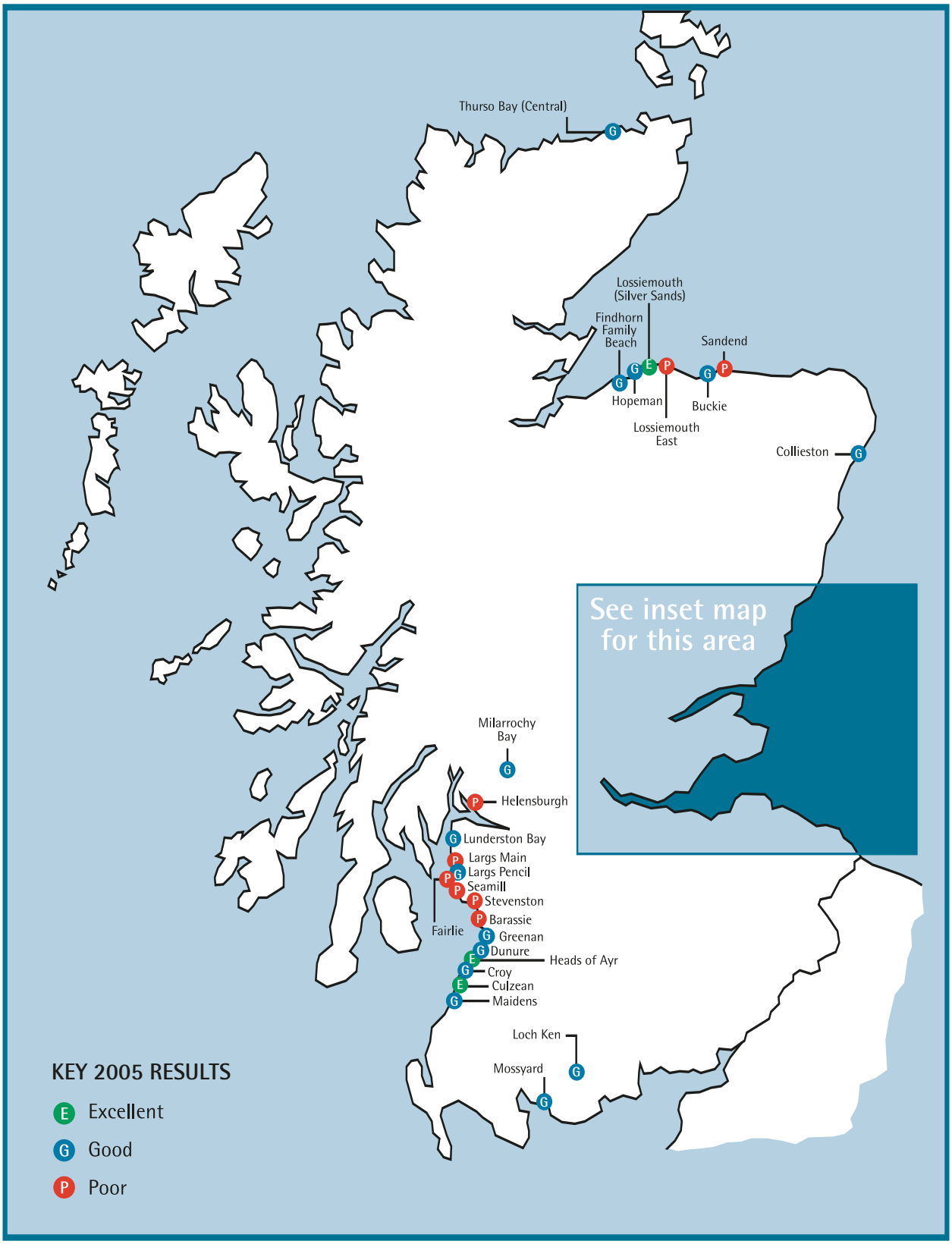
Results are given in detail in Annex 2 and are summarised in Figure 3. Of the 46 sampling sites, in 2005:

- 17 (37 %) were classified as being of excellent quality;
- 20 (43 %) were classified as being of good quality; and
- 9 (20 %) were classified as being of poor quality.

Thus overall, compared with 2004, there were two fewer waters of poor quality in 2005, and four more reached the highest EU guideline standards. The one site monitored in 2004, but not in 2005, is not threatened by any inputs, and was of excellent quality last year.

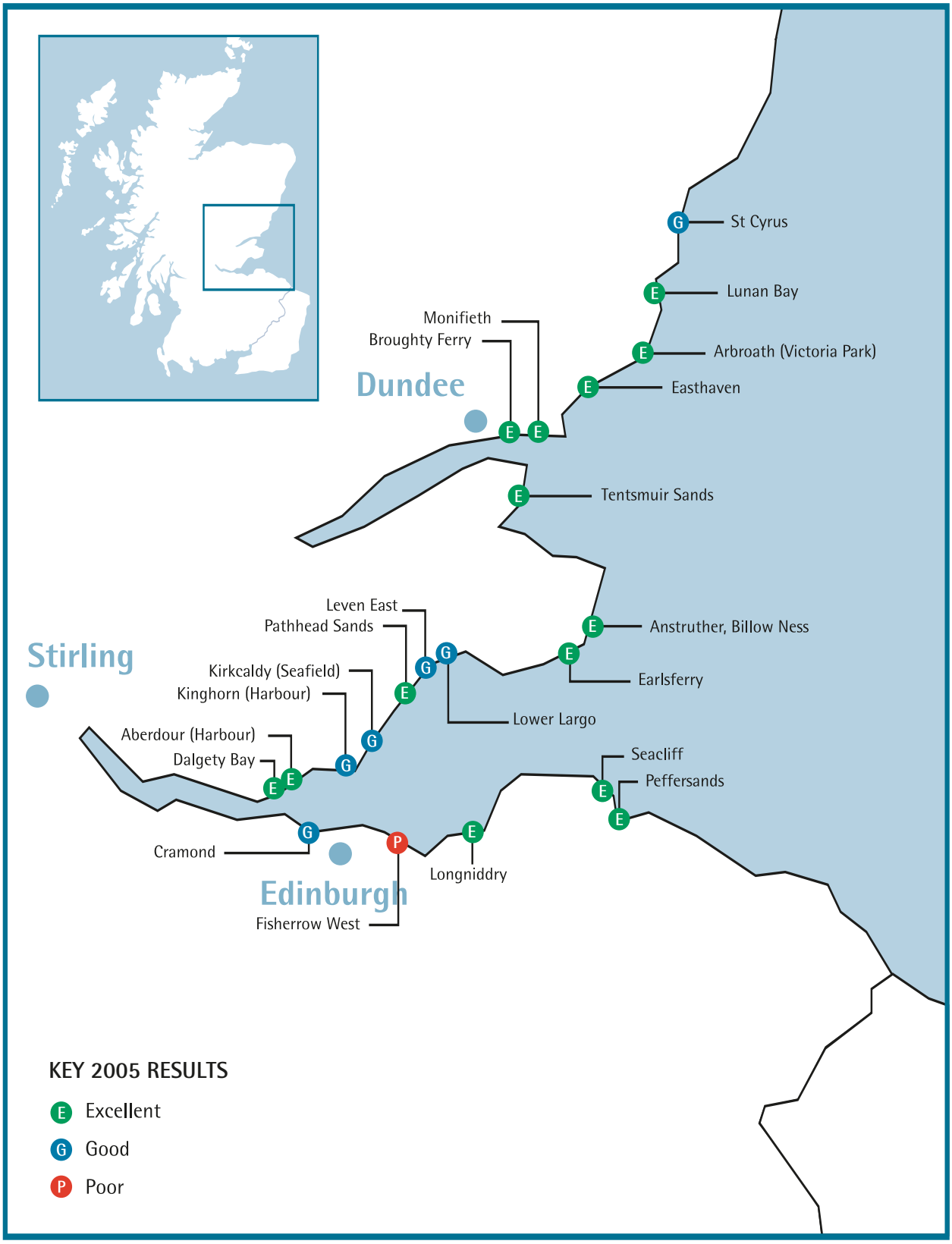
Figure 3: Classification of non-identified bathing water sites

Map 3: Location and results of other waters monitored by SEPA during 2005



Sites sampled at least 20 times during the bathing season

Map 4: Location and results of other waters monitored by SEPA during 2005 (south east area)



Sites sampled at least 20 times during the bathing season

4 Water quality improvement developments

4.1 Scottish Water

Until recently, many decades of significant under-investment in the water and sewerage infrastructure of Scotland have resulted in sewage discharges being the major cause of water pollution. In 2000, many bathing waters were still failing or at risk of failing to meet required EU standards due to unsatisfactory sewage discharges. The situation is now substantially improving, particularly with the introduction of the Quality and Standards (Q&S) process for setting the capital expenditure plans for Scottish Water and its predecessor authorities. Q&S I covered a two-year period from April 2000 to March 2002 and delivered an investment in water and sewerage infrastructure of £740 million, complemented by a further £380 million in Public Private Partnership Schemes. However, these schemes generally only tackled the larger discharges. Much more remained to be done to achieve adequate environmental quality protection.

Q&S II covers the four-year period from April 2002 to March 2006 and comprises an unprecedented scale of investment of £1.8 billion to upgrade and enhance drinking water supply and sewerage provision in Scotland. SEPA has worked with Scottish Water to identify all schemes within the programme that are required to improve the quality of bathing waters and has ensured that these are scheduled for completion as early as possible, with interim temporary solutions being put in place where appropriate.

In 2001, 27 bathing waters were identified as being still at risk of failure as a result of public sewage discharges and the following works have consequently been included within the Q&S II programme. Not all of the projects scheduled for completion have been commissioned on time, and the current situation is described below. In addition, further works are planned in the next stage of the capital investment programme, Q&S III, which will run from 2006 to 2012, details of which are still being finalised.

Southerness: This bathing water had not previously been regarded as at risk of failure as a result of Scottish Water discharges. However, recent monitoring of the Nith and the failure in 2004 indicates that the Dumfries sewerage networks (some 15–20 km upstream) may have an impact. The improvement projects currently being undertaken in Dumfries will deal mainly with debris but will also reduce the spill frequency and duration at some of the CSOs. There is still a risk of failure of the bathing waters and the sewerage networks have been highlighted for upgrading under the Q&S III programme which is scheduled to commence in March 2006.

Rockcliffe: Permanent disinfection was installed, monitored and operational prior to the 2004 bathing season. A new pumping station and storm storage was installed for the 2005 bathing season, to minimise storm overflows.

Turnberry: All discharges from Maidens, Kirkoswald and Turnberry were transferred to Girvan WWTW in 2003. There remain some private sewage effluent discharges at Turnberry, and Scottish Water is investigating the feasibility of a scheme for first time sewerage provision.

Prestwick and Troon South: As Irvine below.

Irvine: It is clear from discussions with Scottish Water that the work to be carried out under the Q&S II projects will not be as extensive as was originally understood by SEPA. The projects currently being undertaken will only tackle debris and will not address the underlying fundamental problem with the CSO, namely spill frequency and duration. It is unlikely that any reduction in the impact from CSO spills or reduction in the risk of failure of the bathing waters will be seen until the implementation of improvements under the Q&S III programme which is not scheduled to commence until March 2006.

Saltcoats: as Irvine.

Millport, Cumbrae: Issues regarding the siting of the new treatment works and pumping stations resulted in the start date of the work being delayed from 2003. However, the new WWTW has now been built and commissioned. Discharge consents have been granted for the emergency, storm and final effluent discharges associated with the scheme.

Luss Bay, Loch Lomond: Tertiary treatment in the form of UV light disinfection has now been provided on site. Consent review is underway to ensure that the WWTW provides full treatment to a sufficiently high sewage flow.

Morar: Consideration was given to improving the sewage treatment for the village of Morar. However, hydrographic studies confirmed that there was no need for any further sewage treatment at Morar.

Dunnet Bay, (Caithness): Scottish Water has altered previously agreed options to transfer sewage to a new WWTW near Thurso. The option currently being considered by Scottish Water is to transfer Castletown sewage across the bay for discharge after septic tank treatment at Dunnet. Discussions are continuing as to whether the dispersion modelling studies can be considered to justify this option.

Dores (Loch Ness): First time sewerage was provided in 2004 to connect all properties (except one) within the village of Dores to the public sewerage system and eliminate private discharges which potentially impact on the quality of the Bathing Water. Scottish water also provided a new septic tank for the village and extended the associated outfall in 2004.

Nairn Central and East Bathing Waters: Problems have been encountered with the upgrading of various works in the Nairn catchment, and at the main Nairn works. Appropriate action is being taken.

Cruden Bay: The former local sewage effluent discharge to the bay was diverted to Peterhead WWTW prior to the start of the 2003 bathing water season. To further protect the bathing water, UV disinfection at Hatton WWTW and the removal of a large septic tank discharge at Bridgend Crescent, Hatton, are due to be delivered in 2006 via the Q&SII process. Both the sewage works and the septic tank discharge to the Water of Cruden, which flows across the beach.

Kingsbarns: After delays in provision of the new WWTW at Kingsbarns, temporary disinfection was again carried out at the works during this year's bathing season. However, the new secondary treatment works has now been constructed and commissioning is expected to be complete by the end of this year (2005).

Dunbar (Belhaven): A new tank sewer has been installed at West Barns to reduce the frequency of storm sewage overflows to the bathing waters during wet weather. However, the commencement of construction of the new WWTW has been delayed due to problems with land acquisition and is now unlikely to be completed before the end of the 2007 bathing season.

Eyemouth: A new sewage treatment works providing full secondary treatment, and a long sea outfall were completed in 2002. Various other sewage sources have since been intercepted and pumped into this treatment system. There remain concerns about other local sources which have not yet been found, particularly those causing pollution of the North Burn. Several sources have been identified and removed, but the burn remains polluted, indicating that there must be other sources.

Provision of first time sewerage for two septic tanks discharging to the North Burn at Acredale was not included in the Scottish Water Q&SII investment programme. However, these two septic tanks have now been connected to the sewer by the developer of an adjacent site.

4.2 Private sewage treatment systems

Not all sewage treatment schemes are part of the public network operated by Scottish Water. Improvements often have to be sought from privately run systems treating waste from caravan sites and even individual homes. Very often the preferred solution is connection to a public system, but this may have to be done at a householder's or developer's expense. This has been done by householders at Seton Sands, and this year a property developer at Eyemouth.

Caravan parks at Southerness on the Solway coast, and at Ganavan North of Oban have been required to upgrade their sewage treatment facilities, and the need for similar upgrading for a site near Pease Bay is currently under consideration. Currently, a new sewage treatment plant for a visitor centre at Culloden is being planned. SEPA will set licence conditions requiring effluent disinfection to protect the quality of the River Nairn and both bathing waters adjacent to the mouth of this river.

4.3 SEPA Environmental improvement plans to reduce sources of pollution

Previous work by SEPA has shown that a variety of factors are responsible for poor quality bathing waters. During dry weather the primary risk to quality is from sewage discharges. This risk has diminished after the investment in new schemes by Scottish Water, such as at Millport on the Isle of Cumbrae. However, heavy rain puts water quality at risk from bacterial loading from sources within catchments of rivers entering the sea close to bathing waters. The south west area has high rainfall and this is recognised as a particular issue. Environmental Improvement Plans have been in place for 4 years in an attempt to reduce the bacterial load entering watercourses.

In a number of SEPA team areas, regular inspections of outfalls, overflows and key points on local watercourses have continued, particularly during the bathing season. This continuous monitoring programme has allowed a rapid response to problems, ensuring that preventive action is taken immediately a problem is identified. Monthly liaison meetings with Scottish Water have ensured that potential impacts on bathing water maintain a high profile and resources can be allocated effectively.

Numerous bathing waters throughout Scotland are affected by bacteria originating from point and diffuse pollution sources on farms. SEPA has continued with its agricultural action plan focused on point source discharges. The plan involved a visit to all farms in high-priority catchments, followed by re-visits to those premises where actual or potential point source pollution was identified. The agricultural team has continued with its partnership approach, very much focused on education, awareness and regulation.

Some 2173 farms have now been visited since the plan was implemented. Overall, cooperation from the agricultural community has been excellent, with 83% of farmers who had non-compliance problems taking action before SEPA's second visit. In 2005, the plan continued to be focused on revisits to identified non-compliant farms, to check that identified remedial works had been carried out. Only a very small number had not started the necessary work and enforcement Notices have been served on three premises. These are expected to be successful in prompting an improvement in standards.

The success of the Bathing Water agricultural team can be measured not only by the number of farms currently compliant, 1732, but by the way the team fostered and encouraged the working cooperation of the farming community. After visits by the team delivering the regulatory message and advice on good practice, waste handling has been improved on over 1000 farms. Farmers themselves have generally shown a willingness to understand and address the issue, although naturally with some concern regarding costs of infrastructure improvements.

4.4 Bathing waters electronic signage: providing daily forecasts of predicted bathing water quality

Electronic online variable message signage was successfully trialled by the Scottish Executive and SEPA during 2003 and 2004. The five pilot signs in 2003 were increased to 10 in 2004, and this year SEPA took over management of the whole signage project. The signs have been designed to inform potential bathers on a daily basis of predicted water quality conditions. Scottish Ministers have now decided to fund SEPA to continue this system for a further three years.

The electronic message signs are located at the following beaches: Ayr (south), Prestwick, Troon, Irvine, Saltcoats, Sandyhills, Brighouse Bay, Ettrick Bay (Bute), Portobello (central) and Aberdeen.

The Scottish Executive initiated and funded this work. SEPA provides scientific advice, validation monitoring and technical input, and manages the daily operation of the sign network. SEPA has also developed additional systems to give wider access to the same information through its website and telephone information line. Other participants include Faber Maunsell (Consulting Engineers) who are sub-contracted by SEPA for the sign installations and technical support. In addition, the relevant local authorities and Clean Coast Scotland are consulted and provide advice.

These bathing waters with signage, although generally of a high quality, have been shown previously to be at risk of occasionally not meeting European standards during or after wet weather. The electronic message signs allow predictive water quality forecast messages to be shown to the public daily. These indicate either good quality, or risk of poor quality, i.e. failure of EU standards.

The signs are not intended as an alternative to environmental improvements or action to reduce pollution, but to provide additional public information. Efforts to reduce or eliminate potential sources of pollution are continuing, and are expected to reduce the frequency with which potential poor quality warnings have to be issued.

From June to mid-September, SEPA issued daily water quality forecasts, using SEPA's extensive rainfall and hydrological information network to take a sign message management decision. The sign status was then recorded via a computer control station, which enabled switching to the relevant version of text message.

Predicted water quality conditions were also posted daily on the SEPA website and the SEPA beach phoneline (**0845 2303098**) as the signs are switched on line. From mid-August, SEPA internally trialled a text message service which replicated the daily water quality forecasts. This text service worked well and may be operational next year.

Further information on background to the system and details of the text messages are available on the SEPA website.

Predictions and results

During the 2005 Bathing season, on average 90% of the days were predicted as having good or better water quality. This was more than last year (81%) and reflected the lower rainfall experienced across Scotland this summer. Of the 200 samples taken from the sites with signage, the signage project correctly predicted measured water quality on 90% of occasions.

Overall, the signage at the 10 locations indicated correct or protective precautionary conditions to the public 99% of the time. This was similar performance to that attained in both 2004 and 2003 (98%), although this year there were fewer dates validated compared with when the signage was being tested under project trialing. A very positive feature of the predictions was that measured quality was so often better than predicted, demonstrating the success of recent diffuse pollution reduction work.

Figure 4: Bathing waters signage performance and validation of daily predictions

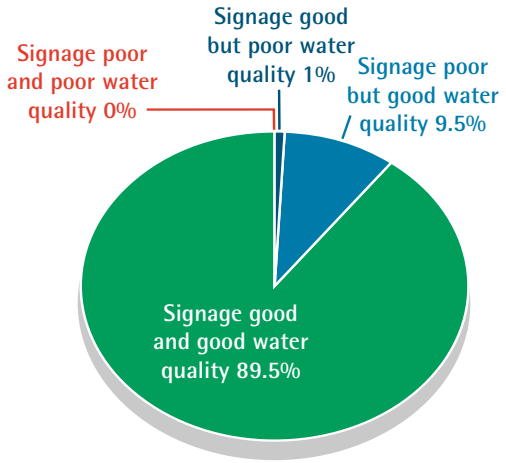
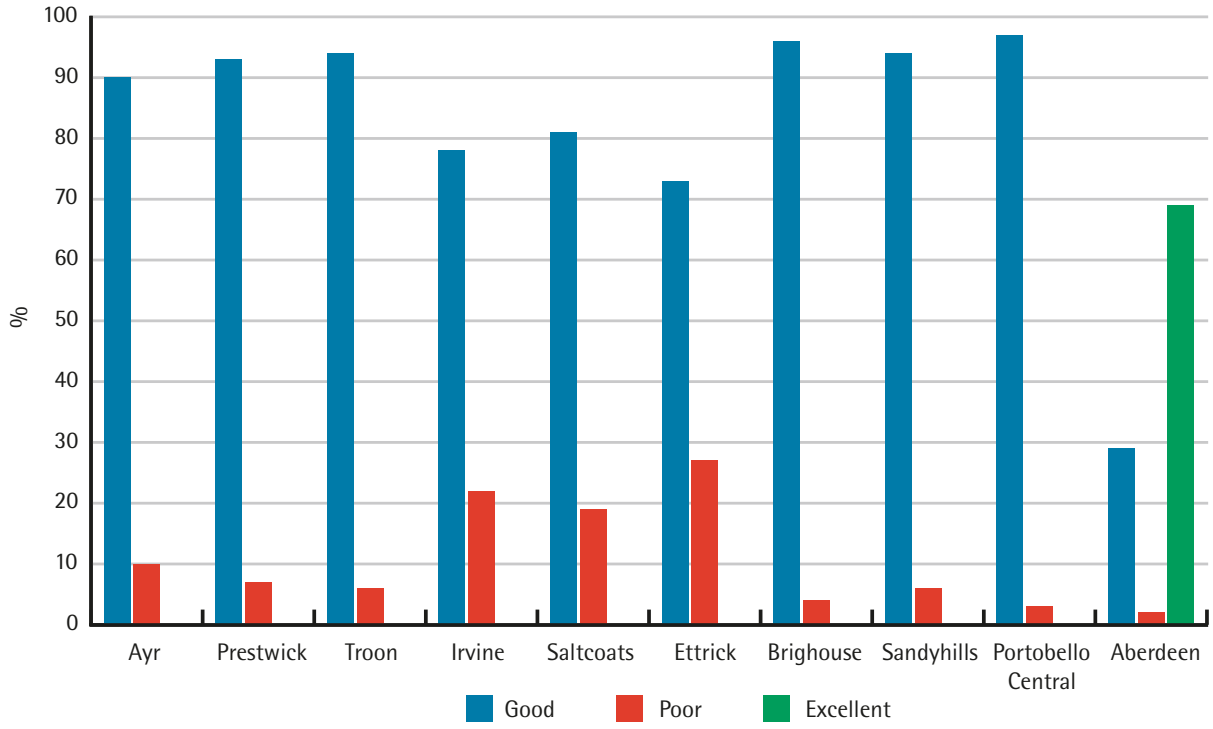


Figure 5: Message status of bathing water signage during 2005



Ongoing work

Further refinements of beach status decision protocols will be made once all the information gained during the 2005 season has been evaluated. The objective is to further improve predictions for future bathing seasons, perhaps with additional midday updates. This will be done by incorporating the 2005 results in the predictive model and introducing other site-specific risk factors such as wind direction, tidal conditions and assessment of other techniques such as rainfall radar data.

Initial discussions have taken place with the Scottish Executive and Maritime Coastguard Agency (MCA) regarding possible upgrading to alternating text messages. These could include safety information. This work will be considered during the closed season.

4.5 Scottish Executive funded pilot projects on diffuse pollution

Between 2002 and 2005, the Scottish Executive has been funding a number of pilot projects to assess different ways of addressing diffuse pollution and providing the public with information on bathing water quality. More information on these projects can be found in the bathing waters section of the Scottish Executive's website[3].

Bathing water signage project

The 2005 developments in the Scottish Executive/SEPA bathing waters signage project are described in Section 4.4.

Farm pilots project

In 2002, the Scottish Agricultural College, Macaulay Institute and Centre for Research into Environment and Health (CREH) were appointed to design farm-based measures to address diffuse pollution sources not covered by SEPA's regulatory powers. Forty-eight farms in the Nairn, Sandyhills, Cessnock (Ayrshire) and Ettrick Bay catchments were identified and agreed to participate. During 2003 and 2004, steading-based measures were constructed in the Ettrick Bay and Cessnock catchments while field-based abatement measures were tried in the Nairn and Sandyhills catchments. There was also monitoring of the receiving watercourses by CREH, to assess the effectiveness of the various measures installed. The final reports on these projects have now been made available on the Scottish Executive's website.

Co-digestion trial

This study investigated the co-digestion of cattle slurry with human sewage sludge at the Scottish Water Cumnock sludge treatment centre in Ayrshire, to assess the feasibility of this process. If adopted, it could reduce the need for slurry spreading on land, and subsequent bacterial run-off during wet weather. A report on this work is available on the Scottish Executive's website.

Biogas and composting project

In December 2003 a project was started to assess the effectiveness of biogas and composting technologies at reducing the bacterial content of slurry and farm yard manure. The subsequent spreading of the digestate and compost would greatly reduce the pollution threat to the watercourses, and downstream bathing water. In the Sandyhills catchment there are four biogas and three composting sheds, with a further three biogas plants in the Saltcoats catchment. Monitoring is being undertaken as well as a full assessment of the economic, environmental and sustainability of such plants. A report on this work is now available on the Scottish Executive's website.

Retrofitting of sustainable urban drainage systems (SUDS)

This project aimed to pilot SUDS techniques to minimise sewer system overflow, which can have a direct influence on bathing water quality. Managed by Scottish Water and funded by the Scottish Executive, it identified sites for the retrofitting of SUDS and compared the costs of this with a conventional engineering approach. These reports are available on the Scottish Executive's website.

[3]www.scotland.gov.uk/topics/environment/water/1556/15068

5 Conclusions

The 2005 monitoring results illustrate continuing improvement in the quality of our bathing waters, although substantially more improvement is still required to meet our quality targets. After so much hard work to minimise sources of diffuse agricultural pollution in southwest Scotland, it was particularly pleasing that, for the first time ever, all bathing waters on the west coast met mandatory EU standards.

It was equally disappointing that three waters on the East coast, which had all met the Directive's standards last year, failed in 2005. These failures were at Nairn East, Stonehaven, and Eyemouth. The causes of failure were rigorously investigated. In contrast to last year, when the main pollution sources causing failure were predominantly diffuse farming and urban sources, sewage sources were found to be strongly implicated in all three 2005 failures. Details have been given in Section 3.2.

Perhaps three factors stand out from recent work and the current year's results:

1. The very substantial environmental improvements delivered by Scottish Water's investments in new sewage treatment schemes, the ongoing need for further such investments, and the need for effective maintenance of the increasing amount of sewerage infrastructure which water quality is dependent upon.
2. The best yet evidence of the success of continuing work to minimise diffuse pollution from agricultural sources, in the form of all the southwest Scotland waters meeting mandatory standards and, particularly, the first time pass of Ettrick Bay.
3. The predictability of less good quality of some bathing waters after heavy rainfall, which the public can now be warned about by electronic signage at beaches, and information on SEPA's website.

Looking to the near future, 2006 is likely to see changes in the list of recognised bathing waters and some further improvements in sewage treatment and diffuse pollution control. In the longer term, it is increasingly probable that a new EU Bathing Waters Directive will bring in significantly different new sampling regimes and compliance standards.

Last year all waters on the east coast met the mandatory EU standards; in 2005 all waters on the west coast achieved this. This demonstrates that in the absence of unseasonably wet weather, and with some luck at sites that are still close to the quality boundary, it should in future be possible to get 100% mandatory compliance. However, the long-term trend of improvement needs to be maintained to add certainty to this compliance, and many waters still need substantial improvement to reach EU guideline standards.

To reach these guideline standards, current levels of pollution from both sewage and diffuse agricultural sources must be further reduced. SEPA will continue to work with and through a wide range of stakeholders to deliver the improvements required. The extent of the improvements that will be needed in the longer term to meet the standards to be prescribed by the expected future revised Bathing Waters Directive started to become clearer after the end of this year's bathing season, when a potentially final text for the new Directive emerged. However, until the proposed new sampling and sample discounting regimes have been finalised and tested in practice, the exact extent of these further improvement needs cannot be exactly determined.

A further source of uncertainty about the future is the current work of a Bathing Waters Review Panel, which is considering and will make recommendations for changes to the list of identified bathing waters. Scottish Ministers will make a decision on the extent of implementation of the recommendations of the panel, before the start of the 2006 bathing season.

SEPA's work with Scottish Water to bring about continued improvements in the sewage infrastructure is very important. The capital investments made so far have brought about real environmental benefits, which are increasingly visible. The next Scottish Water investment programme (Quality and Standards III) will deliver additional improvements. However, the completion of all proposed schemes will be expensive and once more the investment programme will be prioritised to deliver environmental benefits over a long time-scale. SEPA will also continue to carry out audit monitoring on existing facilities to ensure that they are working properly, so that risks of pollution are minimised.

In many urban situations, combined sewer overflows are necessary to prevent flooding during periods of heavy rain. These storm sewer overflows can cause pollution. Heavy rain also washes faecal bacterial pollution from grazed pastures into local watercourses. While fewer people bathe in the sea at these times, the effects of these downpours can persist for a couple of days afterwards. The project carried out in conjunction with the Scottish Executive to use variable message signs to convey bathing water quality information to the public has matured from pilot to operational status. The signs are used to inform bathers when water quality is likely to be of a poorer quality. Our continually improving understanding of the nature of diffuse pollution sources enables not only better signage predictions, but also helps identify the methods needed to reduce pollution. Many of these, such as the fencing off of streams and associated provision of alternative drinking water supply for cattle, are outside SEPA's remit. SEPA is very grateful for the help and support of the Scottish Executive Rural Affairs Department, National Farmers Union and Scottish Agricultural College in effectively progressing diffuse pollution controls, and particularly SEERAD for its pilot funding of trial schemes and innovative works.

It may be hoped that as the quality of our environment continues to improve, perhaps more of Scotland's population may spend a greater proportion of their holidays in Scotland, instead of putting more pressure on the earth's resources by travelling to other countries and generating more carbon dioxide in that process.

Crail (Roome Bay)

Annex One

2005 monitoring data from Scotland's 60 identified bathing waters

			Good Quality (EC Mandatory Standard)		Excellent Quality (EC Guideline Value)			
Bathing Water	Local Authority	No. of sample results	No. of TC* ≤10,000/ 100ml	No. of FC* ≤2000/ 100ml	No. of TC* ≤500/ 100ml	No. of FC* ≤100/ 100ml	No. of FS* ≤100/ 100ml	Overall Quality
Southerness	D&G	20	20	20	17	10	17	Good
Sandyhills	D&G	20	20	20	14	6	11	Good
Rockcliffe	D&G	20	20	20	18	8	16	Good
Brighouse Bay	D&G	20	20	20	16	12	15	Good
Carrick Bay	D&G	20	20	19	12	11	15	Good
Girvan	SA	20	20	20	18	14	13	Good
Turnberry	SA	20	20	20	19	14	18	Good
Ayr South	SA	20	20	20	16	8	16	Good
Prestwick	SA	20	20	19	18	13	15	Good
Troon South	SA	20	20	20	19	17	18	Excellent
Irvine	NA	20	20	20	16	14	14	Good
Saltcoats	NA	20	20	20	16	12	18	Good
Millport, Cumbrae	NA	20	20	20	19	13	16	Good
Luss Bay, Loch Lomond	A&B	20	20	19	13	6	12	Good
Ettrick Bay, Bute	A&B	20	20	19	13	5	12	Good
Machrihanish Bay, Kintyre	A&B	20	20	20	19	17	18	Excellent
Ganavan Bay	A&B	20	20	20	19	14	18	Good
Morar Beach	H	20	20	19	18	18	19	Excellent
Dunnet Bay (Caithness)	H	20	20	20	18	15	18	Good
Dornoch Beach (Caravan Park)	H	20	20	20	20	19	20	Excellent
Dores (Loch Ness)	H	20	20	20	13	13	19	Good
Nairn (Central Beach)	H	20	20	20	19	16	18	Excellent
Nairn (East Beach)	H	20	20	18	16	14	18	Poor
Cullen	Moray	20	20	20	20	18	18	Excellent
Inverboyndie	Aber	20	20	20	17	15	17	Good
Rosehearty	Aber	20	20	20	19	15	17	Good
Fraserburgh	Aber	20	20	20	20	19	20	Excellent
Fraserburgh Philorth	Aber	5	5	5	5	5	5	Excellent
Peterhead Lido	Aber	20	19	19	19	18	18	Excellent
Cruden Bay	Aber	20	20	19	18	11	15	Good
Balmedie	Aber	20	20	20	18	18	20	Excellent
Aberdeen	Aber	20	20	20	18	17	15	Good
Stonehaven	Aber	20	19	18	11	8	11	Poor

			Good Quality (EC Mandatory Standard)		Excellent Quality (EC Guideline Value)			
Bathing Water	Local Authority	No. of sample results	No. of TC* ≤10 000/ 100ml	No. of FC* ≤2000/ 100ml	No. of TC* ≤500/ 100ml	No. of FC* ≤100/ 100ml	No. of FS* ≤100/ 100ml	Overall Quality
Montrose	Angus	20	20	20	18	18	19	Excellent
Arbroath (West Links)	Angus	20	20	20	20	20	19	Excellent
Carnoustie	Angus	20	20	20	17	16	19	Excellent
St Andrews (West Sands)	Fife	20	20	20	20	20	20	Excellent
St Andrews (East Sands)	Fife	20	20	20	19	16	19	Excellent
Kingsbarns	Fife	20	20	20	20	19	20	Excellent
Crail (Roome Bay)	Fife	20	20	20	19	19	19	Excellent
Elie (Woodhaven and Ruby Bay)	Fife	20	20	20	20	18	19	Excellent
Shell Bay	Fife	20	20	20	19	18	19	Excellent
Kinghorn (Pettycur)	Fife	20	20	20	20	20	20	Excellent
Burntisland	Fife	20	20	20	19	19	20	Excellent
Aberdour (Silversands)	Fife	20	20	20	20	19	20	Excellent
Portobello West (Kings Road)	CofE	20	20	20	15	9	12	Good
Portobello Central (James Street)	CofE	20	20	20	16	17	19	Excellent
Seton Sands/Longniddry	EL	20	20	20	18	17	17	Good
Gullane	EL	20	20	20	20	20	20	Excellent
Yellowcraigs	EL	20	20	19	19	17	17	Good
North Berwick Bay	EL	20	20	20	20	16	19	Excellent
North Berwick (Milsey Bay)	EL	20	20	20	19	19	19	Excellent
Dunbar (Belhaven)	EL	20	20	20	20	20	20	Excellent
Dunbar East	EL	20	20	20	19	17	20	Excellent
Whitesands	EL	20	20	20	19	19	20	Excellent
Thorntonloch	EL	5	5	5	5	4	5	Excellent
Pease Bay	SB	5	5	5	5	5	5	Excellent
St Abbs	SB	20	20	20	20	16	19	Excellent
Coldingham	SB	20	20	20	20	18	20	Excellent
Eyemouth	SB	20	18	18	15	11	14	Poor

*denotes TC Total coliforms or FC Faecal coliforms or FS Faecal streptococci.

Local Authority Abbreviation codes:

A&B	Argyll and Bute	H	Highland
Aber	Aberdeenshire	NA	North Ayrshire
CofE	City of Edinburgh	SA	South Ayrshire
D&G	Dumfries and Galloway	SB	Scottish Borders
EL	East Lothian		

Annex Two

Monitoring data from other waters sampled during the 2005 bathing season

		Good Quality (EC Mandatory Standard)		Excellent Quality (EC Guideline Value)			
Bathing Water	No. of sample results	No. of TC* ≤10,000/ 100ml	No. of FC* ≤2000/ 100ml	No. of TC* ≤500/ 100ml	No. of FC* ≤100/ 100ml	No. of FS* ≤100/ 100ml	Overall Quality
Loch Ken	20	20	20	19	12	19	Good
Mossyard	20	20	20	17	14	18	Good
Maidens	20	20	20	18	13	15	Good
Culzean	20	20	20	19	17	20	Excellent
Croy	20	20	19	17	15	17	Good
Heads of Ayr	20	20	20	18	18	20	Excellent
Dunure	20	20	20	16	14	16	Good
Greenan	20	20	19	18	14	18	Good
Barassie	20	19	17	14	12	15	Poor
Stevenston	20	19	15	11	7	12	Poor
Seamill	20	19	18	13	10	15	Poor
Fairlie	20	19	18	15	11	17	Poor
Largs Pencil	20	20	19	13	11	15	Good
Largs Main	20	20	18	7	5	12	Poor
Lunderston Bay	20	20	19	14	12	16	Good
Helensburgh	20	18	15	6	4	10	Poor
Milarrochy Bay	20	20	20	14	9	15	Good
Thurso Bay (Central)	20	20	20	17	15	16	Good
Findhorn Family Beach	20	20	19	6	5	7	Good
Hopeman	20	20	20	18	16	12	Good
Lossiemouth Silver Sands	20	20	20	20	18	18	Excellent
Lossiemouth East	20	18	19	16	14	17	Poor
Buckie	20	20	20	18	15	19	Good

		Good Quality (EC Mandatory Standard)		Excellent Quality (EC Guideline Value)			
Bathing Water	No. of sample results	No. of TC* ≤10 000/ 100ml	No. of FC* ≤2000/ 100ml	No. of TC* ≤500/ 100ml	No. of FC* ≤100/ 100ml	No. of FS* ≤100/ 100ml	Overall Quality
Sandend	20	19	18	13	12	16	Poor
Collieston	20	20	20	19	15	17	Good
St Cyrus	20	20	20	15	14	16	Good
Lunan Bay	5	5	5	5	5	5	Excellent
Arbroath (Victoria Park)	20	20	20	20	20	20	Excellent
Easthaven	20	20	20	20	20	19	Excellent
Monifieth	20	20	20	19	17	19	Excellent
Broughty Ferry	20	20	20	20	20	20	Excellent
Tentsmuir Sands	5	5	5	5	5	5	Excellent
Anstruther, Billow Ness	20	20	20	20	20	20	Excellent
Earlsferry	20	20	20	20	20	20	Excellent
Lower Largo Beach	20	19	19	13	9	14	Good
Leven East	20	20	19	18	15	17	Good
Pathhead Sands	20	20	20	18	18	19	Excellent
Kirkcaldy (Seafield)	20	20	20	17	16	17	Good
Kinghorn (Harbour)	20	20	20	17	13	17	Good
Aberdour (Harbour)	20	20	20	19	19	18	Excellent
Dalgety Bay	20	20	20	19	16	19	Excellent
Cramond	20	20	20	13	5	14	Good
Fisherrow West	20	19	18	15	10	16	Poor
Longniddry	20	20	20	18	18	19	Excellent
Seacliff	5	5	5	5	5	5	Excellent
Peffersands	20	20	20	19	19	20	Excellent

*denotes TC Total coliforms or FC Faecal coliforms or FS Faecal streptococci.

Annex Three

How results are determined

3.1 Interpretation of results and requirements for monitoring programmes

The requirements of the current Directive have been implemented in Scotland by the Bathing Waters (Classification) (Scotland) Regulations 1991. The Directive contains two series of water quality standards: mandatory quality standards which Member States must meet, and more stringent guideline quality standards which Member States must endeavour to achieve. Importantly, the EU standards set are not absolutes, but are expressed as 'percentiles', so not all samples taken have to meet the published standards. This recognises the naturally variable nature of our environment.

Mandatory standards (good quality)

Mandatory standards apply to 10 quality indicators: total coliforms; faecal coliforms; salmonella; enteroviruses; pH, colour; mineral oils; detergents; phenols; and transparency. Ninety-five per cent of samples taken during the bathing season must comply with the mandatory coliform quality standards for the site to achieve a mandatory level pass. Waters which meet this standard are classified as being of good quality, while those that do not are classed as poor.

Guideline values (excellent quality)

In addition to the mandatory standards, there are guideline values for the two coliform groups and faecal streptococci bacterial quality indicators. These guideline values are more stringent than the mandatory standards and, if achieved, indicate very good bathing water quality, described as 'excellent' in this report.

Abnormal weather

Under Article 5.2 of the Directive, results must be excluded from consideration if they are the consequence of abnormal weather conditions. If a result is excluded, then a replacement sample is taken immediately after the abnormal effects have ceased. There was only one event which justified application of this provision in 2005, and this was only for a very limited geographic area.

Exceptional geographic conditions

Under Article 8, the requirements of the Directive may be waived because of exceptional natural geographical conditions in respect of the colour and transparency conditions. For example, Sandyhills on the Solway Firth has a waiver for transparency, because tidal action can lead to high levels of suspended sediment being stirred up. At Nairn (East Beach), a waiver has been granted for both transparency and colour, because the River Nairn, when in spate, discharges peaty coloured water into the sea near the sampling point. Currently, four identified bathing waters in Scotland have waivers for colour and 22 have waivers for transparency.

3.2 Sampling frequency

The minimum frequency of sampling is prescribed in the Annex to the Directive. Checks must normally be made at least once every two weeks during the bathing season for total and faecal coliforms, transparency, colour, mineral oil, detergents (officially, surface-active substances reacting with methylene blue) and phenols. For the remaining parameters with mandatory standards (salmonella, enteroviruses and pH), and for other parameters where inspection is prescribed, concentrations should be checked whenever inspections show that the substance may be present or where the quality of the bathing water has deteriorated.

Additional samples must be taken if there are grounds to suspect that the quality of the waters is deteriorating or is likely to deteriorate as the result of any discharge. Given this requirement, and the historically poor compliance record of Scottish bathing waters, additional samples are generally taken from all waters, so that they are sampled 20 times during the bathing season.

The Directive also permits that the sampling frequency may be halved for waters where quality is consistently good. After the improvements made to Scottish bathing waters, the European Commission in 2003 indicated a list of Scottish sites where this provision may be applied. As described in earlier reports, SEPA implemented this provision for the first time in 2004. SEPA will only apply the provision to waters that meet a very much higher quality hurdle than that required by the EU. This hurdle requires high statistical confidence that the Directive's guideline quality standards have been met over the preceding three-year period. It thus includes results from years before the most recent quality improvement schemes were completed.

SEPA consulted stakeholders on the proposal, and learned that the continuing award of 'Blue Flag' and other beach quality indicators required a monitoring frequency higher than the minimum specified in the Directive. In order that these sites did not lose their accreditation, they were maintained on SEPA's more frequent monitoring list. The reduced sampling frequency provision is therefore only applied at three identified bathing waters and three other sites.

3.3 Interpretation of microbiological values

The Directive sets standards for microbiological quality indicator organisms which are all naturally present in the guts of humans and all other warm-blooded animals. The presence of these indicators of faecal contamination in excess of the values in the Directive indicates that waters may have received discharges of sewage which have not been given adequate treatment or dilution. Large concentrations of seabirds or livestock slurries and manure also give rise to these microbiological indicators in bathing waters and the latter must therefore be properly applied to agricultural land to prevent pollution. The bacteria and viruses present in sewage and animal excreta may cause illness, especially as a result of ingestion or infection through wounds or cuts.

Article 5 of the Directive specifies how the results of faecal coliform, total coliform and faecal streptococci monitoring are to be interpreted. These are summarised in Table 1 (below).

Table 1: Interpretation of microbiological values for bathing waters where 20 samples have been taken

Level of pass	Symbols used in this report	Interpretations	Total coliforms	Faecal coliforms	Faecal streptococci
Pass - Guideline	E (Excellent)	Directive states:	80% of samples should not exceed 500 total coliforms per 100 ml.	80% of samples should not exceed 100 faecal coliforms per 100 ml.	90% of samples should not exceed 100 faecal streptococci per 100 ml.
		Based on 20 samples:	Must have at least 16 samples with less than, or equal to, 500 total coliforms per 100 ml.	Must have at least 16 samples with less than, or equal to, 100 faecal coliforms per 100 ml.	Must have at least 18 samples with less than, or equal to, 100 faecal streptococci per 100 ml.
Pass - Mandatory	G (Good)	Directive states:	95% of samples should not exceed 10,000 total coliforms per 100 ml.	95% of samples should not exceed 2,000 faecal coliforms per 100 ml.	The Directive contains no mandatory standard for faecal streptococci.
		Based on 20 samples:	Can only have 1 sample with greater than 10,000 total coliforms per 100 ml.	Can only have 1 sample with greater than 2,000 faecal coliforms per 100 ml.	The Directive contains no mandatory standard for faecal streptococci.

Annex Four

Glossary of terms and abbreviations

Aesthetic pollution In the context of this report, pollution caused by sewage solids, sanitary goods and other items which are visually offensive.

Combined Sewer Overflows (CSO) Overflow pipes designed to operate during periods of high rainfall to relieve pressure on sewerage systems and so prevent flooding. CSO allow rainwater and diluted but minimally treated sewage (usually screened to remove solids) to bypass treatment works and flow directly into rivers and coastal waters.

COPA The Control of Pollution Act 1974, as amended by the Environment Act, 1995.

Diffuse pollution Pollution arising from land-use activities (urban and rural) that are dispersed across a catchment, or sub-catchment, and do not arise as a process effluent, municipal sewage effluent, or an effluent discharge from farm buildings.

EC European Commission (of the EU).

EU European Union

Excellent quality This indicates that a bathing water met guideline value quality standards in the EU Bathing Water Directive over the season as a whole.

Faecal coliforms and faecal streptococci Types of bacteria found in sewage and animal excreta whose presence in high numbers indicates poor water quality. Although not necessarily disease causing themselves, high levels of these indicator bacteria at a site indicate that disease causing organisms may be present.

Good quality This indicates that a bathing water met mandatory value quality standards in the EU Bathing Water Directive over the season as a whole.

Guideline value A value specified in EU legislation as a recommended standard, more stringent than the minimum mandatory standard.

Identified bathing water A bathing water identified by the Government under the terms of the EU Bathing Water Directive.

PEPFAA Code Code of Good Practice for the Prevention of Environmental Pollution from Agricultural Activity.

Point source pollution Pollution from a discrete source such as a discharge pipe or a slurry storage tank.

Poor quality This indicates that a bathing water failed to meet mandatory value quality standards in the EC Bathing Water Directive over the season as a whole.

Preliminary treatment The treatment of waste water to remove solids by means such as screens, macerators and/or grit separators.

Primary sewage treatment The treatment of waste water to settle out suspended solids in primary sedimentation tanks. It is normal for waste water to receive preliminary treatment prior to sedimentation.

SAC Scottish Agricultural College.

Secondary sewage treatment The treatment of sewage by a biological process, for example, percolating filters or activated sludge, resulting in the further reduction of suspended solids, ammonia and biochemical oxygen demand.

Sea outfall pipe A pipe which conveys and discharges treated waste water into coastal or estuarine waters.

Sewerage The system of pipes and pumps which conveys sewage effluent from homes to treatment works.

SEPA Scottish Environment Protection Agency.

Shellfish Waters Directive EU Directive (79/923/EEC) which aims to protect the quality of coastal and brackish waters designated for protection or improvement in order to support particular shellfish populations.

Tertiary sewage treatment Further treatment of effluent generally using sand sewage treatment filter beds or very fine screening, or disinfection processes.

Total coliforms A count of all the coliform type bacteria present in a sample of water.

UV Disinfection The UV irradiation of treated sewage effluent, in order to render the final effluent substantially disinfected.

Water Industry Commissioner Appointed by the Scottish Executive, the Water Industry Commissioner's remit is to promote the interests of the Water Authorities' customers.

WWTW Waste Water Treatment Works, the same as a sewage treatment works (STW).

Annex Five

Sources of additional information on bathing water quality

Technical queries or enquiries about SEPA's bathing water quality monitoring programme should be directed to your local SEPA Office (See Annex Six for details).

SEPA's website (www.sepa.org.uk) contains a wide collection of information on SEPA, as well as the text from previous Scottish bathing waters reports. The results from the monitoring programme for identified bathing waters are placed on SEPA's website as they are produced throughout the bathing water season.

A number of other organisations complement SEPA's role in promoting high standards of bathing water quality. The Marine Conservation Society (MCS), the UK charity dedicated to the protection of the marine environment and its wildlife, publishes the Good Beach Guide every year, listing all identified and many non-identified bathing waters around the entire UK coastline. The recommended beaches can be viewed at www.goodbeachguide.co.uk. In Scotland, the charity Keep Scotland Beautiful administers the Seaside Awards for beaches. These awards recognise beaches which are clean, safe and which comply with the Bathing Water Directive's mandatory standards. As well as the Seaside Awards, Keep Scotland Beautiful administers the European Blue Flag Campaign in Scotland, on behalf of the Foundation for Environmental Education. This is an award presented to beaches across Europe that fulfil strict criteria relating to both water quality and environmental management in the surrounding beach area. The Blue Flag award requires water quality to be guideline standard. In 2005, seven beaches in Scotland achieved Blue Flag status: Aberdour (Silversands), Broughty Ferry, Burntisland, Elie Harbour, Montrose, St Andrews East Sands and St Andrews West Sands. Clean Coast Scotland (CCS) is a partnership bringing together 15 different government and non-government bodies to coordinate and raise the profile of Scottish beaches and bathing waters. CCS worked with SEPA in 2003 to produce a poster template for local authorities to display bathing water results at beaches in a consistent manner.

Shell Bay

Water Authority
Scottish Water,
Castle House,
6 Castle Drive,
Carnegie Campus,
Dunfermline,
KY11 8GG

Tel: 0845 601 8855

www.scottishwater.co.uk

Marine Conservation Society
Gloucester Road,
Ross-on-Wye,
Herefordshire,
HR9 5BU

Tel: 01989 566017

www.mcsuk.org

Keep Scotland Beautiful and Clean Coast Scotland
Islay House,
Livilands Lane,
Stirling,
FK8 2BG

Tel: 01786 471333

www.encams.org

The website address for the Seaside Awards is: **www.seasideawards.org.uk**

The website address for the Blue Flag Awards is: **www.blueflag.org**

Information on bathing water quality in England and Wales can be obtained from the Environment Agency, and in Northern Ireland from the Environment and Heritage Service:

Environment Agency
Enquiries@environment-agency.gov.uk

Tel: 0845 9333111

www.environment-agency.gov.uk

Environment and Heritage Service
ep@doeni.gov.uk

Environment Protection

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Annex Six

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