

Issue

Sewage spills in any estuary leads to the closure of that estuary for 21 days or more to prevent human virus particles entering the waterway and contaminating the oysters. During the closure period the oyster farmers are unable to harvest the oysters for sale thus affecting their cash flow and profits. Oyster farmers have had difficulty in seeking compensation for loss of business from various government agencies as none of them accept responsibility for the sewer spills claiming the disaster is an act of nature. The oyster farmers dispute this as in most cases sewer spills occur due to negligence on the part of authorities responsible for the proper operation and maintenance of the sewer systems.

Background Information

The oyster business operators enter into a lease agreement with the understanding that they will be able to receive a clean waterway that will provide a saleable product. The oyster producers do not have any control over what occurs on the land situated within the catchment. This responsibility lies with both Local and State Government through the development process.

In case of any sewer spills, it is difficult to determine the responsible agency with State Government referring to Local Government responsibilities and Local Government referring to the state. It is reasonable to suggest that both levels of Government should accept some responsibility for not preventing the problem in the first place.

What are Sewer Spills?

Sewage spills occur when the wastewater being transported via underground pipes overflows through a manhole, cleanout, or broken pipe. Sewage spills can cause health hazards and damage to oyster businesses; as such spills threaten the environment, local waterways, and beaches.

Common Causes of Sewer Spills

1. Structural Problems

Structure problems caused by tree roots in the lines, broken/cracked pipes, missing or broken cleanout caps, or undersized sewers can cause blockages.

2. Grease

Grease builds up inside and eventually blocks sewer pipes. Grease gets into the sewer from food establishments, household drains, as well as from poorly maintained commercial grease traps and interceptors. Grease is the most common cause of pipe blockages.

3. Infiltration and Inflow

Infiltration and inflow impacts pipe capacity and is caused when groundwater or rainwater enters the sewer system through pipe defects and illegal connections.

Sewer Spills and Actions Taken

In non-sewered urban and rural residential developments, sewage management is decentralised and domestic wastewaters are usually treated and disposed of on-site. These on-site wastewater treatment systems provide for in excess of two million people, and are common in the rapidly developing outskirts of large cities, small communities in rural and coastal areas, in rural/residential developments and where residences are isolated from reticulation services¹.

¹ Geary, P.M., 1992. Diffuse pollution from wastewater disposal in small unsewered communities, *Aust. J. Soil and Water Cons.*, 5, 1,

In many instances, on-site wastewater treatment systems, which were initially intended as short-term alternatives prior to the provision of reticulated sewerage, have become more permanent features as the cost to provide reticulated sewerage systems steadily increases. According to Geary² it has been estimated that 18-20% of the Australian population and 15% of all households in NSW (approximately 280,000 on-site wastewater systems) rely on decentralised systems of sewage management. Almost half (45%) of these systems in NSW are in non-metropolitan households, and many of these are situated in sensitive locations along the coastal fringe.

Surveys undertaken in the early 1990s on the performance of on-site wastewater systems by O'Neill³ suggested that in excess of 40% of systems were failing and contributing to a range of environmental management problems.

The report produced following the Public Inquiry into the Management of Sewage and Sewage By-products in the NSW Coastal Zone by Codd⁴, not only reported failure rates in the range of from 50-90%, but also stated that all on-site facilities may experience failure at some stage during their operational life. The inquiry also found that an

“effective whole-of-government co-ordination and leadership was essential to long term strategies for management of sewage in the coastal zone”.

The public health and environmental health implications of on-site systems have been brought to the fore with concerns over the possible contribution of on-site systems to elevated nutrient loadings and algal blooms. According to Atherholdt et al⁵ the 1996 outbreak of hepatitis in Wallis Lake, NSW has resulted in close scrutiny of poorly performing on-site systems as a potential source of microbiological contamination.

The cumulative effects from the failure of large numbers of on-site systems, particularly in sensitive locations, combined with poor quality runoff from other land uses following heavy rainfall, can result in significant water quality impacts to downstream receptors.

For instance, the 1997 outbreak of Hepatitis A in Wallis Lake (due to the consumption of contaminated oysters) and the highly publicised occurrence of the protozoan parasites *Cryptosporidium* and *Giardia* in the Sydney water supply in 1998 were linked to the inadequate management of faecal waste material in these catchments.

According to Ferguson et al⁶ estuaries are particularly sensitive to pollutants derived from various catchment land uses, such as urban and agricultural runoff, sewage outfalls and effluent disposal from unsewered residential areas. Nutrients and particularly indicator and pathogenic micro-organisms from inappropriately treated faecal material can make their way into estuarine environments following heavy rainfall.

² Geary, P.M, 1998. *Domestic Wastewater – Treatment and Reuse*, Environment Design Guide, DES24, November 1998, The Royal Australian Institute of Architects, Melbourne.

³ O'Neill, R., Roads, G., and Weise, R., 1993, On-site waste water treatment and disposal in NSW, report prepared for Department of Water Resources and the University of Technology, Sydney.

⁴ Codd, M. 1997, Public inquiry into the management of sewage and sewage by-products in the NSW coastal zone, NSW Environment Protection Authority

⁵ Atherholdt, T., Le Chavallier, M., Norton, W. and Rosen, J., 1998. Effect of Rainfall on *Giardia* and *Cryptosporidium*, *Journal AWWA*, September.

⁶ Ferguson, C.M., Coote, B.G., Ashbolt, N. and Stevenson, I.M., 1996, Relationships between Indicators, Pathogens and Water Quality in an Estuarine System, *Wat. Res.*, 30, 9, 2045-2054.

The Healthy Rivers Commission Report⁷ highlights that oysters have an enormous potential to concentrate in their gut large numbers of micro-organisms and are therefore particularly susceptible in faecally contaminated waters.

White⁸, in commissioned advice to the Healthy Rivers Commission, stated that one of the principal threats to oyster production is the human faecal contamination of oyster growing waters and the ingestion of those oysters by humans.

Hackney and Pierson⁹ state that failing septic systems are frequently cited as one of the major sources of faecal contamination in shellfish growing waters.

A sanitary survey by Brooker¹⁰ of on-site systems and other potential sources of faecal pollution reported on-site system failure rates of approximately 33% in the Wallis Lake catchment. However, other human activities, including waste from boating activities, were also considered possible sources of the faecal pollution responsible for the oyster contamination.

Following the Wallis Lake incident, a number of recommendations were made by Codd¹¹ which aimed to improve water quality necessary for a healthy and productive oyster industry. Better sewage management strategies for coastal local government areas where oyster growing occurs were recommended. The NSW Minister for Local Government announced a package of reforms in 1998 dealing with on-site sewage management. The SepticSafe Program, as outlined by Irvine and Hillier¹², had the following objectives:

- To identify and assess existing on-site sewage management systems;
- To develop and implement local government policies and programs to supervise the operation of those systems and to systematically manage cumulative pollution impacts;
- To implement sustainable on-site sewage management practices through a range of government functions;
- To assess the impact of sewage pollution on river systems and to implement pollution action plans and management programs; and
- To establish ongoing accountability through state of the environment reporting.

⁷ Healthy Rivers Commission, 2003. Oysters Independent Review of the relationship between Healthy Oysters and Healthy Rivers, Final Report March 2003, Healthy Rivers Commission, Sydney.

⁸ White, I. 2001, Safeguarding Environmental Conditions for Oyster Cultivation in New South Wales, Centre for Resource and Environmental Studies, ANU, Canberra, Report to Healthy Rivers Commission, Occasional Paper OCP 1004 Sydney.

⁹ Hackney, C.R. and Pierson, M.D. (eds) 1994, *Environmental Indicators and Shellfish Safety*, Chapman and Hall, New York.

¹⁰ Brooker, B. 1999, The source of Faecal Coliforms in Wallis Lake, *Proceedings of 9th NSW Annual Coastal Conference*, Forster, NSW Coastal Council,

¹¹ Codd, M. 1997, Public inquiry into the management of sewage and sewage by-products in the NSW coastal zone, NSW Environment Protection Authority.

¹² Irvine, R and Hillier, H 1999, Beyond Wallis Lake: New South Wales on-site sewage management reforms and application to coastal zone risk management, *Proceedings of 9th NSW Annual Conference*, Forster, NSW Coastal Conf 386-393.

According to Department of Local Government¹³ the program involved the introduction of new guidelines for the siting and design of on-site wastewater systems and the development of more comprehensive sewage pollution action plans in environmentally sensitive areas, such as seafood production areas, water supply catchments and sensitive groundwater catchments.

Despite the above actions, sewage spill continue to occur on a regular basis. The different government agencies are reluctant to take responsibility for controlling water pollution (see section 5 below) and prevent the problem from occurring in the first place. Furthermore, the agencies are not willing to compensate the oyster producers for loss of business due to sewage spills.

Acts on Water Pollution and Sewer Spills

Estuaries management in New South Wales has been strengthened with the introduction of coastal management; water, vegetation and catchment management reforms.

- The *Water Management Act 2000 (NSW)* protects water quality and quantity, including estuaries, by preparing water management plans and stressed rivers classification.
- Amendment of the *Catchment Management Act 1989 (NSW)* has provided for catchment management boards, and a greater level of integration and efficiency in management of natural resources.
- Sensitive estuarine wetlands are protected through the New South Wales Wetlands Policy and the declaration of State Environment Protection Policy 14 wetland protection through planning legislation.
- Amendments to the *Fisheries Management Act 1994 (NSW)* provide greater protection for marine flora and fauna in estuaries affected by development proposals.

Role of agencies on environment related matters including water pollution and sewer spills

Various NSW Government agencies have responsibility for environment related matters.

The objectives and activities of each agency are defined by legislation and by periodic vetting of corporate objectives and strategies.

The four key environmental agencies of the NSW Government are:

- The Environment Protection Authority;
- The Department of Urban Affairs and Planning;
- The Department of Land and Water Conservation; and
- The National Parks and Wildlife Service.

Between them, these agencies have responsibility for:

- environmental planning;
- impact assessment;
- environmental monitoring;
- support for community environmental groups;
- community education about environmental issues;
- regulation to protect the environment;

¹³ Department of Local Government 1998, *Environment and Health Protection Guidelines, on-site sewage management for single households*, Bankstown, NSW.

- enforcement of environmental controls on activities that threaten the ecology; and
- funding for infrastructure and counteracting environmental damage.

The Environment Protection Authority (EPA)

The NSW EPA has a mandate to protect, rehabilitate and enhance the environment of New South Wales, having regard to the need to maintain ecologically sustainable development. EPA promotes strategies for preventing and reducing pollution; encourages waste minimisation and recycling; regulates the collection, transport, treatment, storage and disposal of waste; establishes minimum environmental standards and sets targets for environmental improvement; ensures the community has access to relevant information about hazardous substances; and promotes community involvement in, and awareness of, environmental issues.

EPA has established a number of independent public inquiries using commissioners to review and make recommendations on fundamental environmental concerns. These include the Healthy Rivers Commission and the Commission into Coastal Sewage Management.

The Department of Planning (DoP)

The DoP is responsible for land use planning, policy and regulation, for management of the urban environment and for the development of housing policies.

DUAP develops planning guidelines for metropolitan areas that emphasise the integration of environmental conservation and economic growth. It also develops environmental policies and regulations in relation to natural resource management, with particular emphasis on the coast, wetlands, forests, river catchments, vegetation, wildlife and heritage conservation; assesses the environmental impact of major developments and infrastructure projects throughout the state; and develops housing policy and provides housing assistance.

The Department of Environment and Climate Change (DECC)

DECC deals with the ownership, use and conservation of the natural resources of land, water, coastal areas, soil and vegetation and with integrated natural resource information.

DECC develops resource policy to ensure the sustainable management and use of land, soils, rivers, groundwater, coastal areas, vegetation and forests; collects and provides information on the land and water resources of New South Wales; manages (in cooperation with local councils) water and sewerage delivery services outside metropolitan areas; manages estuaries, floodplains and crown land; operates rural dams; and administers Aboriginal land claims.

The key agencies often work in partnership with other NSW Government agencies and with other government, industry and community organisations with an interest in the environment. Local government authorities, in particular, provide support in land use and environmental planning, administration of development controls, provision of water and sewerage services in rural towns and waste disposal services.

Commissioners of Inquiry, the Land and Environment Court and the judiciary have an important role in reviewing and enforcing environmental regulations.

Fines for Water Pollution

The Department of Environment and Climate Change have prosecuted polluters, some even for sewer spills. There is also an interesting case study on a historic agreement in the US concerning sewer spills (please see below).

It therefore is possible that oyster farmers may be eligible for some form of compensation due to sewer spills.

US Sewer Spill Case

One of the largest sewage cases in U.S. history, the Department of Justice, U.S. Environmental Protection Agency, the Los Angeles Regional Water Quality Control Board, Santa Monica Baykeeper and a coalition of Los Angeles community groups have reached a \$2 billion settlement with the city of Los Angeles over years of sewage spills.

Under the terms of the historic agreement, the city of Los Angeles will rebuild at least 488 miles of sewer lines, clean 2,800 miles of sewers annually, enhance its program to control restaurant grease discharges, increase the sewage system's capacity, and plan for future expansion.

With approximately 6,500 miles of sewer lines serving almost 4 million residents, the city operates the largest sewage collection system in the country. Since 1994, the city has experienced over 4,500 sewage spills.

The United States and the regional board are settling their civil penalty claims against the city for a total of \$1.6 million, which they will share equally. The city will pay \$800,000 to the U.S. Treasury. The regional board is directing its \$800,000 to local environmental improvement projects that the city will perform.

This settlement is a groundbreaking effort to address all causes of sewage spills and odors in the city of Los Angeles. The terms of the settlement require a proactive approach designed to prevent problems from developing in the city's system. The city is required to undertake more aggressive maintenance practices and advanced planning to identify and repair or replace problem sewers before they spill.

Conclusion

One of the principal threats to oyster production is the faecal contamination of oyster growing areas from on-site wastewater systems. Monitoring which is undertaken does indicate that there are occasions, particularly following heavy rainfall, when the established bacteriological guidelines for both estuarine waters and oyster tissue are exceeded. The difficulty remains, however, in distinguishing between the sources of the faecal contamination, and in identifying whether the faecal contamination is of human origin and from failing on-site wastewater treatment systems.

Preliminary research indicates that on-site sewer systems are the major sources of sewer spills. However more research is needed to determine more precisely the sources of sewer spills to ensure the success of any future compensation claims by oyster farmers.

The EPA public inquiry of 1997 into the management of sewage and sewage by-products in NSW coastal zone has revealed that that there is no effective whole-of-government co-ordination to manage sewer spills and need to be addressed.