ON-SITE WASTEWATER MANAGEMENT STRATEGY

2023–2025

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MIDCOAST council

Contents

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Acknowledgement of Country

We acknowledge the traditional custodians of the land on which we live and work, the Gathang-speaking people, and pay our respects to all Aboriginal and Torres Strait Islander people who reside in the MidCoast Council area. We also extend our respect to elders past and present and to all future cultural-knowledge holders.

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GLOSSARY OF TERMS

ATO	Approval to operate a septic system
DA	Development application
EP&A Act	Environmental Planning and Assessment Act 1979
MCC	MidCoast Council
MHL	Manly Hydraulics Laboratory
OWM	On-site wastewater management
POAA	Priority oyster aquaculture area
POEO Act	Protection of the Environment Operations Act 1997
Septic system	Any system that stores and treats wastewater on-site
The Act	Local Government Act 1993
The Department	Department of Regional NSW
The Regulation	Local Government (General) Regulation 2021
The Silver Book	Environment & Health Protection Guidelines: On-site Sewage Management for Single Households
The Strategy	This On-site Wastewater Management Strategy
TDV	Tidal discharge velocity
VHR	Very high risk

EXECUTIVE SUMMARY

The MidCoast Council local government area contains approximately 13,000 septic systems across 10,053 km². This on-site wastewater management strategy was developed as a starting point to help Council's Environmental Health Officers identify areas that require immediate attention to protect public health, the environment and local businesses from failing or poorly operated septic systems.

A preliminary risk assessment has revealed that approximately 520 systems near priority oyster aquaculture areas within the Wallis Lake, Port Stephens/Karuah River and Manning River estuaries are likely to present the greatest risk to public health and the environment and therefore should be inspected as part of a carefully considered monitoring program. Council's officers will take a calculated and measured approach when addressing noncompliant systems and activities in these environmentally sensitive areas, balancing the needs of the individual against those of the wider community.

It is anticipated that about 40 per cent of systems inspected in the first 12 months of implementing the monitoring program will to some degree require follow-up action, which is based on recent proactive inspections in oyster aquaculture areas primarily in the former Great Lakes Council area. Existing resources, therefore, have been carefully considered using a risk-based approach to ensure that the cumulative impacts associated with such a substantial number of geographically dispersed systems are managed appropriately.

1. INTRODUCTION

MidCoast Council ('MCC' or 'Council') was formed on 12 May 2016 by State Government proclamation through a merger of Greater Taree City, Gloucester Shire and Great Lakes Councils. The MCC region has an estimated resident population of 94,395 and occupies 10,053 km² in the southern reaches of the NSW mid-north coast, which includes the Wallis Lake, Port Stephens/Karuah River and Manning River estuaries, some of the most significant oyster harvest areas in the state.

This on-site wastewater management strategy ('Strategy') was developed as a starting point to help MCC regulate approximately 13,000 septic systems across the region, particularly in environmentally sensitive areas where failing or poorly operated systems could harm the environment, public health and local tourism and oyster farming businesses. Specifically, this Strategy will help Council's Environmental Health Officers (EHOs) in the Building and Environmental Health Services Department identify systems that require immediate strategic attention to prevent or substantially mitigate large-scale pollution and contamination of ecologically and economically significant waterways. It is important to note that this Strategy excludes 'pump-to-sewer' systems (pressurised systems in place of a conventional gravity sewerage system), which are regulated by Council's Water Services Department.

Due to the large number of geographically dispersed systems, efforts will be concentrated in moderately to densely populated unsewered regions near priority oyster aquaculture areas (POAAs), where both the risks and cumulative impacts associated with the discharge of effluent into the environment require careful management. Although the former councils each developed and implemented a comparable strategy to varying degrees of success, this Strategy represents the first of its kind for MCC. Therefore, existing resources have been carefully considered to ensure Council's officers successfully manage the risks and impacts associated with a substantial number of septic systems.

1.1 Purpose & goals

Septic systems can cause significant harm to public health and the environment if they are not properly designed, installed and operated. The operational status of most systems in the region is unfortunately unknown, but it is expected that many systems would fail to meet the performance standards specified in clause 44 of the *Local Government (General) Regulation 2021* (the Regulation) under the *Local Government Act 1993* (the Act). While it would be ideal that all systems are inspected yearly by an authorised officer with expertise in on-site wastewater management (OWM), Council must take a strategic approach to manage the number of systems within the region.

As will be shown, focusing on systems in oyster aquaculture areas ensures regulatory efforts are directed to where they are most likely needed, which still poses a considerable challenge to Council's resources. Nevertheless, large regional councils often have limited resources, which underscores the

importance of implementing a well-defined strategy for regulating septic systems. The following goals have been identified as important for enabling Council to manage the risks and cumulative impacts associated with OWM:

- Ensure new septic systems across the region are designed and installed in line with legislative requirements and industry best practices;
- Ensure systems of very high risk (as defined in this Strategy) meet the performance standards specified in the Regulation;
- Ensure failing systems are identified and rectified as soon as possible;
- Ensure key stakeholders across the region are aware of their responsibilities with regard to OWM. Key stakeholders in this context includes property owners, real estate agents, developers, conveyancers, environmental consultants (designers), installers (plumbers and drainers) and service agents;
- Ensure adequate resources are available to achieve the objectives of this Strategy, especially the monitoring program; and
- Develop and implement key performance measures that will enable accurate reporting and review of the outcomes of this Strategy for continual improvement.

1.2 Legislation & industry best practice

Regulatory activities associated with OWM are governed by State Government legislation. Industry best practices, on the other hand, while not legally binding, help councils meet their legislative responsibilities. The following legislation and reputable industry resources have guided the development of this Strategy and have set the parameters for Council's existing assessment and compliance procedures.

1.2.1 LOCAL GOVERNMENT ACT & REGULATION

The Act and Regulation set the legislative foundation and framework for councils in regulating the design, installation and operation of septic systems in NSW. Under the Act, council approval is required in most circumstances before installing, altering and operating a system. The Regulation, in contrast, defines the performance standards each system must achieve together with the accreditation role of NSW Health in determining which systems can be installed to store and treat domestic wastewater. Importantly, the Act and Regulation define the various enforcement options available to authorised officers to resolve system failures and unapproved systems.

1.2.2 PROTECTION OF THE ENVIRONMENT OPERATIONS ACT

Like the Act, the *Protection of the Environment Operations Act 1997* (POEO Act) gives authorised officers specific enforcement powers to resolve irresponsible or potentially harmful OWM activities. Specifically, officers can issue notices and orders when a system is deemed to be operating in an environmentally unsatisfactory manner. It is important to note, however, that the POEO Act extends beyond problematic OWM systems and practices and provides for pollution matters outside the scope of this Strategy, meaning that the Act and Regulation would typically be referred to in the first instance to rectify noncompliant systems.

1.2.3 ENVIRONMENTAL PLANNING AND ASSESSMENT ACT

The *Environmental Planning and Assessment Act 1979* (EP&A Act) defines the role of councils in regulating the potential impacts associated with the development of land. Councils play a crucial role under the EP&A Act in shaping human activities and protecting the environment in their LGAs in line with ecologically sustainable development principles. Therefore, OWM should be given sufficient consideration at the development stage to ensure systems and assessment activities meet legislative requirements.

1.2.4 ENVIRONMENT & HEALTH PROTECTION GUIDELINES

The Department of Local Government's *Environment & Health Protection Guidelines: On-site Sewage Management for Single Households* (the Silver Book), published in 1998, is the only legislated guidance document in NSW on all facets of OWM. The Silver Book has been instrumental in educating councils about OWM, especially so in the late 1990s and early 2000s when little was known then about the impacts associated with failing septic systems. Despite its age, it is still regarded as a valuable reference for understanding foundational standards and practices in the industry and is often considered an important guide by authorised officers when assessing septic applications under section 68 of the Act.

1.2.5 AUSTRALIAN STANDARD 1547:2012

AS/NZS 1547:2012 On-site Domestic Wastewater Management (Standard 1547), published in February 2012, details industry best practices for OWM and is a key resource for council officers when assessing applications under the Act to install, alter and operate a septic system. While not a legislated document, Standard 1547 is held in high regard in the industry and offers greater depth in OWM than the Silver Book does, primarily because the industry has evolved substantially since the 1990s.

1.2.6 OTHER IMPORTANT RESOURCES

Other valuable resources that support Council's officers with assessing applications and inspecting septic systems include:

- AS/NZS 3500.1:2021 Plumbing and Drainage Water Services, published in May 2021;
- AS/NZS 1546.1:2008 On-site Domestic Wastewater Treatment Units Part 1: Septic Tanks, published in May 2008;
- AS/NZS 1546.2:2008 On-site Domestic Wastewater Treatment Units Part 2: Waterless Composting Toilets, published in May 2008;
- AS/NZS 1546.3:2017 On-site Domestic Wastewater Treatment Units Part 3: Secondary Treatment Systems, published in February 2017;
- AS/NZS 1546.3:2017 On-site Domestic Wastewater Treatment Units Part 4: Domestic Greywater Treatment Systems, published in November 2016;
- Greywater Reuse in Sewered Single Domestic Premises, published by NSW Health in April 2000;
- Sewage Management Facility Vessel Accreditation Guideline (Septic Tanks, Collection Wells, Sewage Ejection Pump Stations, Etc.), published by NSW Health in February 2016;
- NSW Oyster Industry Sustainable Aquaculture Strategy Fourth Edition 2021 published by the Department of Regional NSW, month unknown;
- Code of Practice – Onsite Wastewater Management (Publication 891.4), published by the Environment Protection Authority (Victoria) in July 2016;
- Enforcement Guidelines for Councils by the NSW Ombudsman, published in December 2015;
- State Environmental Planning Policy No 62—Sustainable Aquaculture, published in August 2000;
- State Environmental Planning Policy (Primary Production and Rural Development) 2019, published in July 2019, now State Environmental Planning Policy (Primary Production) 2021, published in March 2022;
- Advisory Note 3 (Revised January 2017): Destruction, Removal or Reuse of Septic Tanks, Collections Wells, Aerated Wastewater Treatment Systems (AWTS) and other Sewage Management Facilities (SMF), published by NSW Health, month unknown; and
- Designing and Installing On-site Wastewater Systems, published by WaterNSW in November 2019.

2. APPROVALS UNDER THE ACT & REGULATION

Council's existing approval processes and procedures not only form a vital role in ensuring new systems comply with the latest industry standards but will also maximise regulatory coverage across the region by complimenting the monitoring program detailed in this Strategy, which focuses on existing systems.

Therefore, it is imperative that sufficient resources are available to allow Council's EHOs to complete both reactive and proactive activities on a consistent basis. This is difficult to determine in advance, as these regulatory functions are influenced to varying degrees by unforeseen events and trends (e.g., the COVID-19 pandemic, large-scale bushfires and floods and the most recent building boom). Accordingly, monitoring and assessment efforts will likely evolve once the monitoring program has been implemented, which will be addressed in future strategies. It is important to note that this Strategy focuses primarily on existing systems more than 10 years of age, as systems installed since 2012 have been rigorously designed in line with Standard 1547 and likely pose less of a threat to public health and the environment.

2.1 Approvals to install or alter a system

As mentioned, Council approval is required under most circumstances to install, alter and operate a septic system. Applications seeking approval to install or alter a system must include sufficient information to allow Council's officers to determine whether a proposal satisfies legislative requirements and industry best practices. The most recent housing boom observed in the area has seen a substantial increase in the number of development applications (DAs) submitted to Council, which has inevitably meant greater resources have been required for OWM assessments under both the Act and EP&A Act. This demand for resources is expected to persist for the duration of this Strategy, which highlights the importance of adopting a strategy that offers Council's EHOs enough flexibility to respond to changes in the market and public interests.

2.2 Approvals to operate a system

New approvals to operate a septic system (ATOs) are issued on a case-by-case basis throughout the year for recently installed or altered systems that comply with the latest requirements. ATOs are then renewed periodically and reiterate both Council's expectations and the required performance standards that must be achieved by each system, as detailed in the Regulation. Due to limited resources, most ATOs have been renewed automatically without compliance checks, meaning that the operational status of most systems in the region is unknown. Although landholders are ultimately responsible for ensuring that their septic system complies with the conditions in the ATO, it is expected that many systems are noncompliant and would need to be upgraded. Therefore, a key facet of this Strategy is helping Council's officers to detect and appropriately resolve noncompliant systems in areas where the impacts are likely to be the most significant. As will be discussed, systems in less sensitive environments will

be initially inspected reactively in response to complaints, queries, DAs (where necessary), section 68 applications (alterations) and pre-purchase inspection applications, unless future resources allow greater regulatory coverage across the region. Data collected during the implementation of this Strategy will be pivotal for shaping future strategies and managing resources.

2.3 Pre-purchase inspections

For any number of reasons, some systems do not have a current ATO, which is usually identified at the sale of a property. Typically, a conveyancer representing either the purchaser or seller will enquire about the compliance status of a septic system or systems at a property on the market or to be placed on the market, and where Council approval has not been issued, a pre-purchase inspection application is submitted for assessment.

Upon receipt of the application, EHOs in the On-site Wastewater Management Section review Council's records and inspect the system to determine whether it poses or is likely to pose a threat to public health and the environment. Because OWM recordkeeping practices at the former Councils were sometimes less than ideal and because property owners do not always notify Council of alterations they make to their system, the inspection is regarded as the most significant step for determining both the design and likely operational capacity of a system. Although it would be ideal that all systems in the region are designed in line with the latest industry practices and standards, it is important to note that these standards have not been imposed on relatively old systems that appear to be in safe working order, despite being undersized and operationally unsophisticated by today's standards. This practice will continue as part of this Strategy, as it is considered reasonable and economically sensitive to the community. Following the inspection, an ATO will be issued for unregistered systems that do not appear to pose a threat to public health and the environment, with conditions that communicate both Council's expectations and the required performance standards.

A system upgrade, however, will likely be required under this Strategy where surface pooling of effluent is detected in the disposal area, where effluent is above the outlet pipe in the treatment (septic) tank, which typically indicates failure in the disposal/land application system, or where it has been reasonably determined that wastewater from a development cannot be safely stored and treated in an existing system. Because upgrading a system can be costly, Council's EHOs will ensure that they have adopted a pragmatic and proportionate mindset when assessing systems that are showing signs of failure.

3. DEVELOPMENT APPLICATIONS

3.1 Assessment under the EP&A Act

Under the EP&A Act, Council's officers are required to consider the potential impacts associated with the development of land. DAs submitted to Council for unsewered allotments are referred to the On-site Wastewater Management Section for review from an OWM perspective. This may include DAs for new dwellings, subdivisions (including boundary adjustments), rezonings, alterations or additions and changes of use. In some cases, meetings are held with Council's officers prior to DA submission, which can save the community time and money, especially for proposals involving large, complex developments in environmentally sensitive areas. Where required, EHOs in the On-site Wastewater Management Section attend these meetings to communicate the latest legislative requirements and industry standards for OWM.

3.2 Site & desktop assessments

Council's EHOs may also complete a site inspection after a DA has been referred to determine the potential impacts of a proposed development on public health and the environment, which can sometimes be difficult to ascertain by only completing a desktop assessment using Council's mapping and data management systems. Development proposals in aquaculture areas are referred to the Department of Regional NSW ('the Department'; formally the Department of Primary Industries) in line with State Environmental Planning Policy (Primary Production) 2021 and the *NSW Oyster Industry Sustainable Aquaculture Strategy 2021 (Fourth Edition)*. Because Council's DA referral procedure has been pivotal in recent years for building stakeholder relationships and solving complex problems at the preliminary stages of development, it will continue as part of this Strategy. Again, the demand this regulatory activity places on existing resources will fluctuate based on a variety of factors.

4. MONITORING PROGRAM

The monitoring program detailed in this Section has been given careful consideration to ensure Council is effective in managing the risks associated with OWM across the region.

Therefore, this Section represents the most crucial aspect of the Strategy with regard to managing both resources and public expectations. It is important to note that procedures are expected to evolve once the Strategy has been adopted because the ramifications and implications of the details herein cannot be known with confidence until after the Strategy has been implemented. Accordingly, future strategies will be shaped by that learned within the first 24 months of implementing the monitoring program.

4.1 Performance standards

Ensuring that systems do not cause harm to public health and the environment is a key part of this Strategy. Clause 44 of the Regulation states that Council's EHOs must consider the following performance standards when assessing a septic system, which have been included to set the context for the monitoring program:

(a) Prevents the spread of disease by microorganisms;

(b) Prevents the spread of foul odours;

(c) Prevents contamination of water;

(d) Prevents degradation of soil and vegetation;

(e) Discourages insects and vermin;

(f) Ensures that persons do not come into contact with untreated sewage or effluent (whether treated or not) in their ordinary activities on the premises concerned;

(g) Minimises any adverse impacts on the amenity of the premises and surrounding lands; and

(h) If appropriate, re-uses resources (including nutrients, organic matter and water).

These performance standards are detailed in Council's ATOs, issued periodically to property owners, but it cannot be assumed that owners are diligent in ensuring their septic system complies with the Regulation. The position presented in this Strategy is that high-risk systems should be inspected regularly by a Council officer at a frequency that best reflects the level of risk to public health and the environment and which available resources allow. For thoroughness, a theoretical approach has been adopted to identify and manage systems that are likely to pose the greatest risk.

4.2 Risk assessment

All systems to some degree pose a risk to public health and the environment. Understanding these risks and their likelihood is key to optimising resources and regulatory coverage across Council's environmentally and geographically challenging region. Risk assessment is a term used to describe the overall process or method used to achieve the following objectives:

(a) Identify hazards and risk factors that have the potential to cause harm (hazard identification);

(b) Analyse and evaluate risks associated with that hazard (risk analysis and risk evaluation); and

(c) Determine appropriate ways to eliminate the hazard or control the risk when the hazard cannot be eliminated (risk control).

4.2.1 HAZARD IDENTIFICATION

Wastewater from a development varies considerably throughout the year in quantity and composition, which influences the operational performance of a system. Primary treatment in a septic tank relies on the anaerobic breakdown of organic matter by microbes and the settling of solids. Shock loads or biocide use can impact the ability of these microbes to treat the wastewater and solids passing through the primary treatment stage, potentially resulting in effluent of poor quality being discharged into the environment. Soils also play a crucial role in OWM, as they function as the last line of defence between subsurface treatment and groundwater and, depending on the soil type, can influence surface irrigation of effluent. Therefore, understanding a soil's ability to accept, treat and disperse applied effluent is an important aspect of OWM. Under most conditions, system failure occurs as a result of poor system design and installation coupled with insufficient maintenance, all of which may contribute to the potential public and environmental health risks identified in this Section.

Public health hazards

Bacteria, protozoa, algae, fungi and viruses can all be found in natural waters and wastewater. While some of these organisms pose no threat to human health and are necessary for life (beneficial), pathogenic or 'disease-causing' organisms can cause serious or significant harm under the right conditions. Pathogenic organisms can be broadly classified into the following three categories:

(a) Bacteria—Wastewater comprises a vast variety and concentration of pathogenic and non-pathogenic bacteria across systems. Pathogenic bacteria, if present in sufficient numbers, can cause disease upon contact, particularly in vulnerable individuals (e.g., cholera and typhoid). Because testing for pathogens in water is difficult and expensive, 'indicator bacteria' are targeted instead, as they indicate the possibility of faecal contamination in water (e.g., coliform bacteria such as Escherichia coli).

(b) Parasites (protozoa and helminths)—The two most dominant protozoan parasites of concern in the treatment of wastewater are Cryptosporidium

and Giardia. Both of these pathogens are typically resistant to disinfection methods (chlorine) and pose a considerable risk to susceptible populations (i.e., children, older adults and the immunocompromised). Helminths, 'intestinal worms', are also commonly found in wastewater and can release millions of environmentally resilient eggs during their lifespan.

(c) Viruses—Contamination of wastewater by viruses can result in major outbreaks, such as hepatitis A, the most dominant waterborne virus. Other prevalent viruses transmitted in wastewater include enteroviruses, rotaviruses and noroviruses, which typically cause gastroenteritis symptoms in humans upon contact. Viruses are more common and diverse than bacteria are in the aquatic environment and can cause widespread illness on an epidemic scale, such as the Wallis Lake hepatitis A outbreak in the late 1990s, which was instrumental in drawing people's attention to the potential large-scale impacts associated with failing and poorly designed septic systems.

A pathogen's ability to survive depends on environmental conditions and the type and life stage of the organism. Some organisms produce highly resilient spores that can persist in unfavourable conditions for prolonged periods and that can be transported considerable distances in surface and ground waters. Therefore, considering the cumulative impacts of failing septic systems in an area is a key step in determining the likely risk to public health and the environment.

Environmental hazards

Nutrients and other trace quantities of elements are essential for biological growth. Phosphorus (P) and nitrogen (N) are the principal nutrients of concern with regard to septic systems and are present in a range of compounds in untreated and treated wastewater. Excess P and N can encourage the prolific growth of algae and other nuisance aquatic plants in surface waters, which can lead to ecological disruptions and reduced water quality. Expectedly, water supplies of poor quality are more difficult and costly to treat for drinking water purposes compared to water taken from catchments where pollution inputs are lower.

Social hazards

Poor OWM may have financial implications for the treatment of drinking water supplies when effluent is discharged into waterways, the costs of which are eventually reflected onto the community, typically affecting the most economically disadvantaged the most. There are also financial implications for property owners who have a failing system, as new systems can be expensive to install. Failing systems, especially on small allotments, may also adversely impact public amenity and cause public nuisances (i.e., offensive odours).

Tidal discharge velocity

Sewage discharge and agricultural runoff can increase the load of nutrients, faecal bacteria and pathogenic viruses in environmentally and economically significant waterways. Because of the ephemeral nature of discharges, their diffuse sources and uncertainties about the transport and transformation of pollutants through the freshwater–marine interface, identifying sources of pollution is especially challenging if not impossible in some circumstances.

Alarmingly, human pathogens can accumulate both within sediments and on suspended sediments ('flocs'), where the deposition of flocculated particles encourages reservoirs of potentially pathogenic microbes in sediments. For example, some viruses can accumulate in sediments to such an extent that the concentration can be as much as 10,000 times greater than that found in the water column. Pathogenic microbes may also become protected from abiotic (e.g., salinity, UV radiation) and biotic (e.g., predation) stresses when certain chemical, physical and biological processes induce a coflocculation of microbes, mineral particles and organic matter.

It is important, therefore, that this risk assessment considers the potential impacts that tidal discharge velocities (TDVs) can have on oyster harvest areas and water quality in extremely sensitive receiving environments, as areas of poor tidal variance may act as reservoirs for pathogenic microbes. Furthermore, oyster harvest areas may be impacted if sediments or flocs become resuspended due to flooding or other mechanical means. The following information was obtained from Manly Hydraulics Laboratory (MHL; a business unit within the Water Division of the Department of Planning, Industry and Environment) and has been used in this Strategy to identify high-priority areas in the region. Despite the age of the studies, the findings still bear relevance for understanding TDVs in coastal areas throughout the MidCoast region.

Port Stephens estuary

The Port Stephens estuary is a tide-dominated barrier estuary in a drowned river valley and is the largest estuarine waterway area in NSW (166 km^2), comprising the major tributaries of Tilligerry Creek and the Myall and Karuah Rivers. The waterway measures 6 km north to south and 23 km east to west and contains the largest area of saltmarsh (8 km^2) and mangroves (23 km^2) in NSW. It is the largest producer of oysters in the state and contains an extensive number of oyster leases and oyster spat areas. Water quality issues are of major concern, primarily due to current levels of waterway-oriented development occurring around Port Stephens, which includes marinas, wharves and foreshore tourist attractions. As shown in Figures 1 and 2, North Arm Cove and the Myall River were two areas MHL identified as having a low TDV.

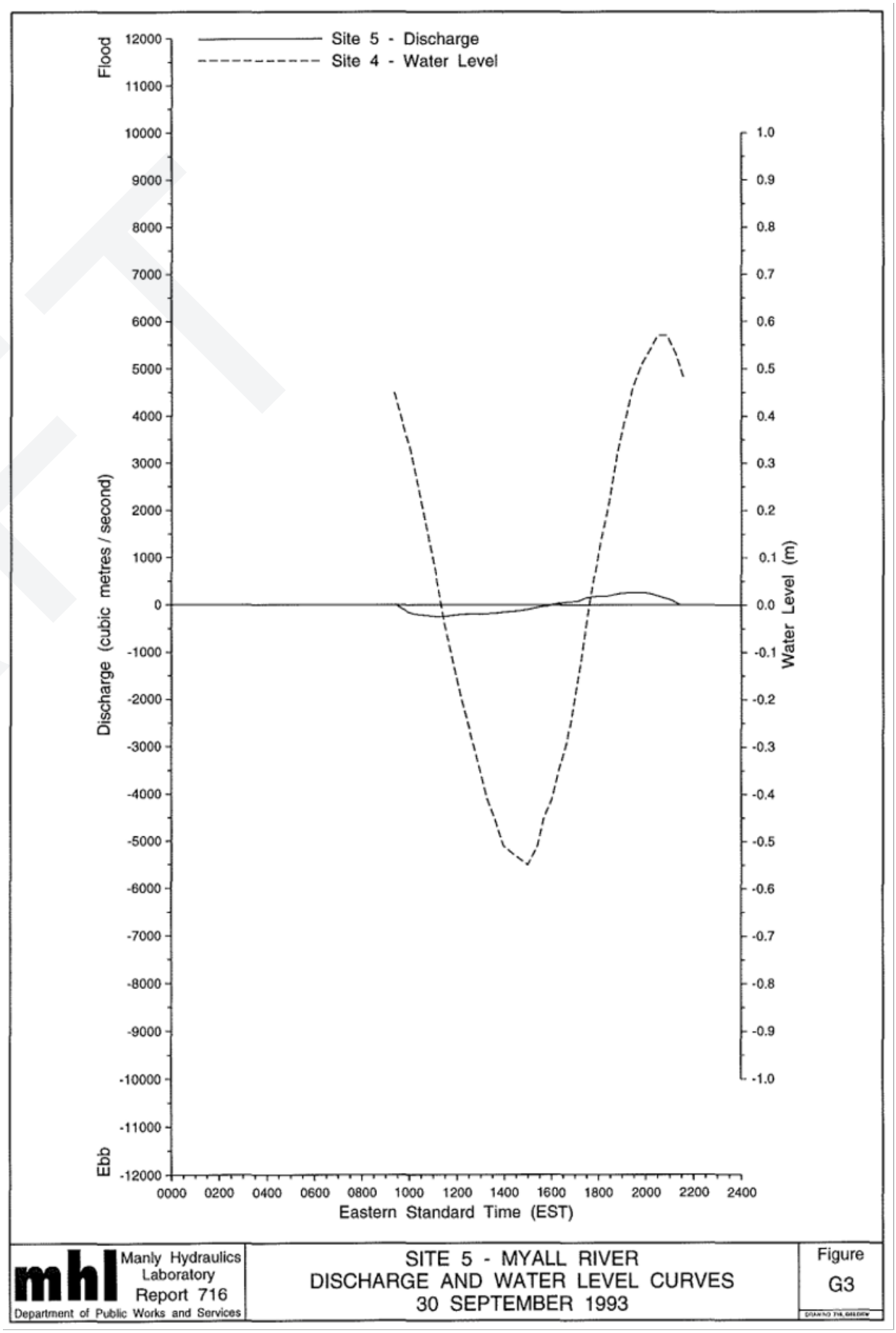

Figure 1: TDV at Myall River (Site 5)

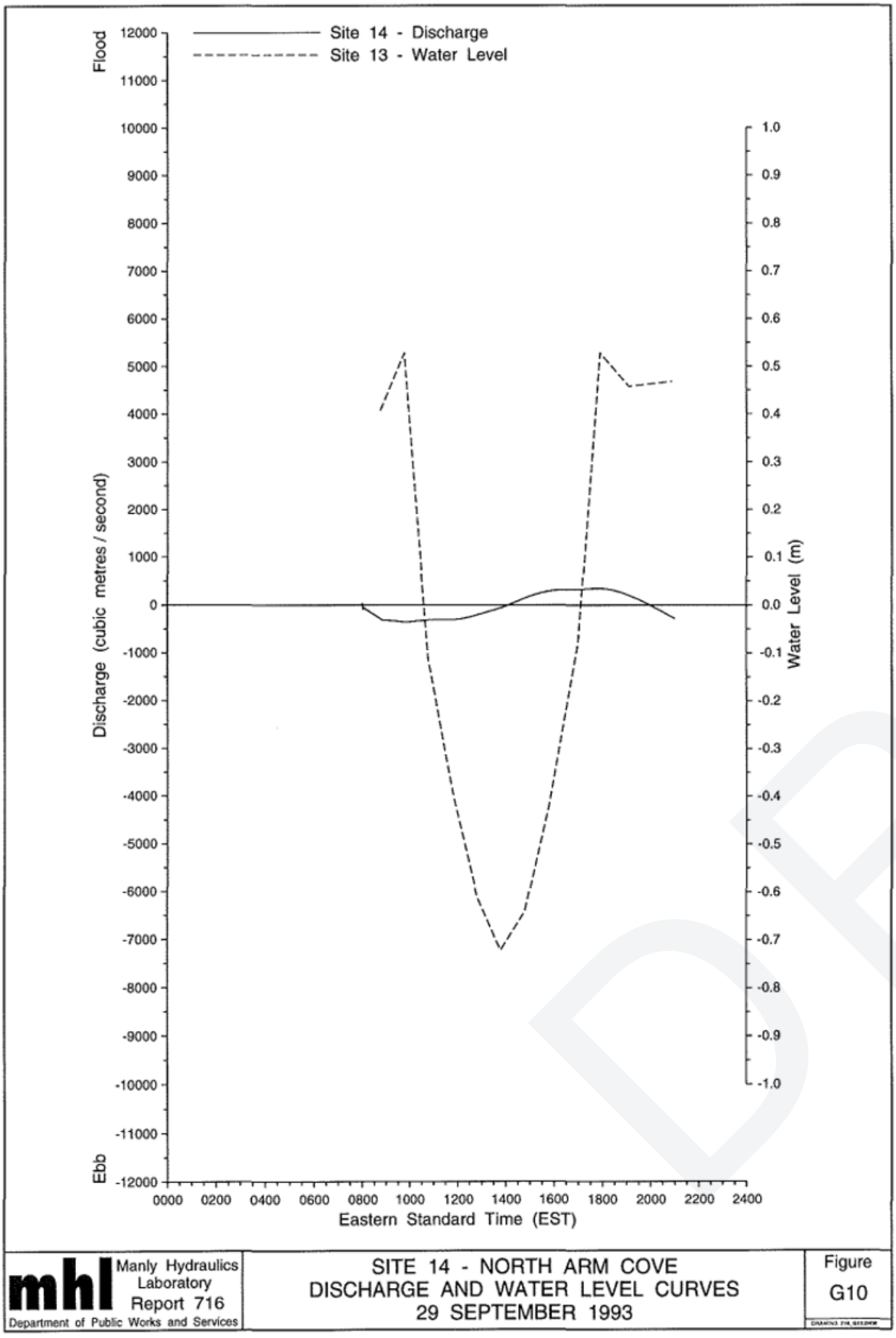

Figure 2: TDV at North Arm Cove (Site 14)

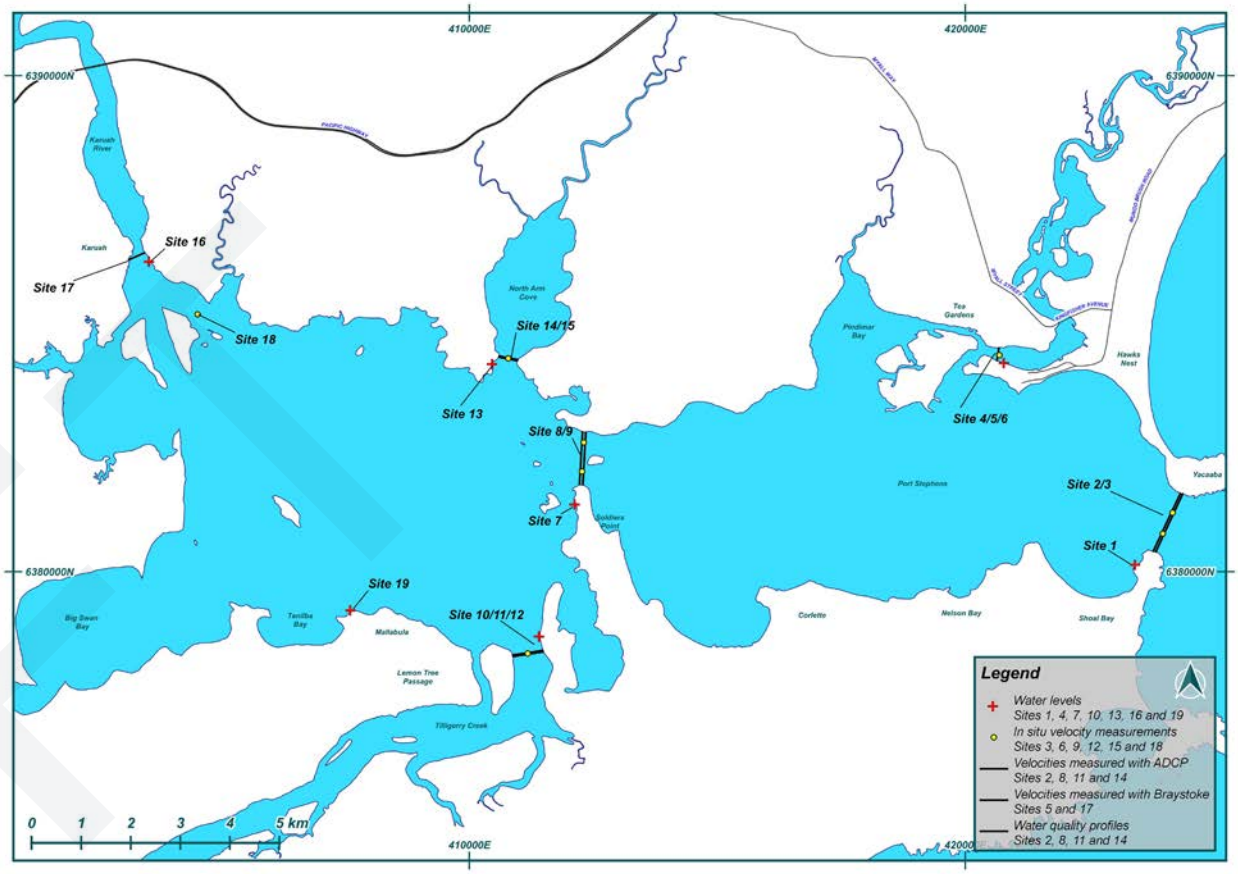

Figure 3: Study sites in the Port Stephens estuary

Wallis Lake estuary

The Wallis Lake estuary is a complex system of rivers, lakes and interconnecting channels that enter the sea through Cape Hawke Harbour between Tuncurry and Forster. The estuary comprises Wallis Lake, with the Wang Wauk, Coolongolook and Wallingat Rivers entering from the west and the Wallamba River from the north. The estuary has a total catchment area of 1420 km^2 that extends 40 km to the west and 40 km north to south, equating to a total waterway area of around 73 km^2, and includes extensive saltmarsh areas and the largest estuarine seagrass areas in NSW. MHL's study of Wallis Lake identified three areas with poor TDV, as shown in Figures 4–8. Systems operating close to these sites should be monitored regularly to ensure they do not pose a threat to public health and the environment.

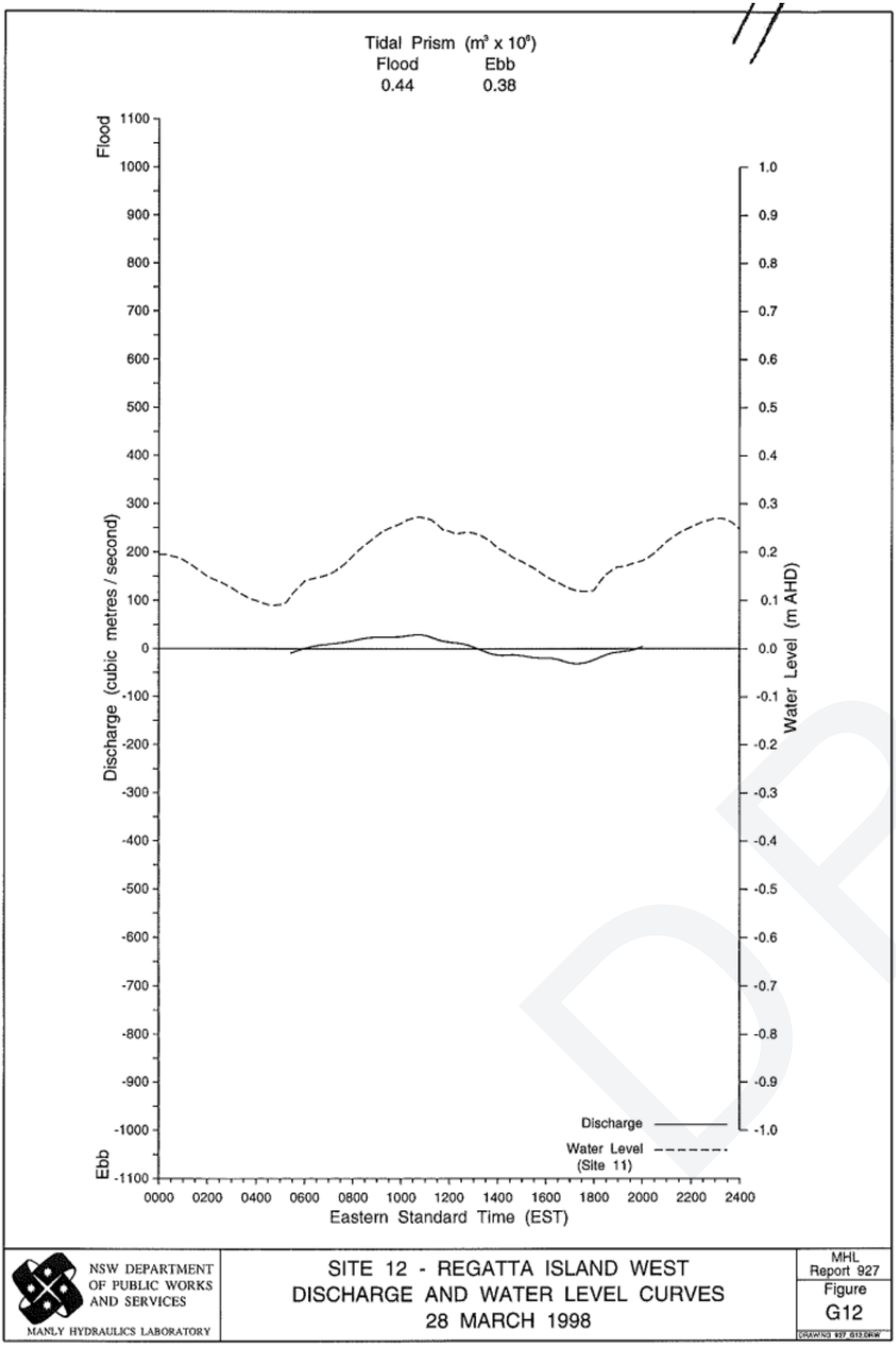

Figure 4: TDV west of Regatta Island (Site 12)

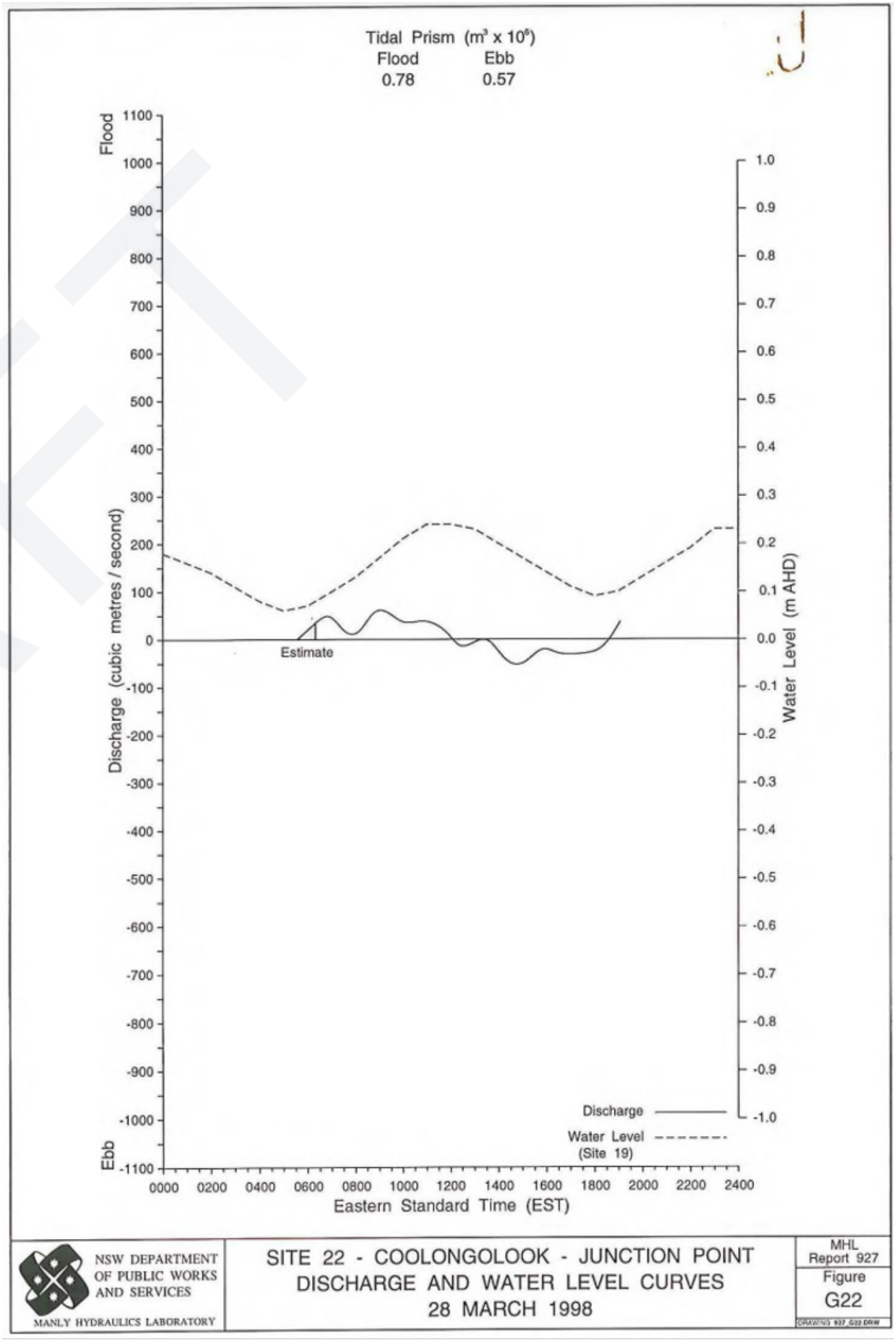

Figure 5: TDV at Coolongolook River (Site 22)

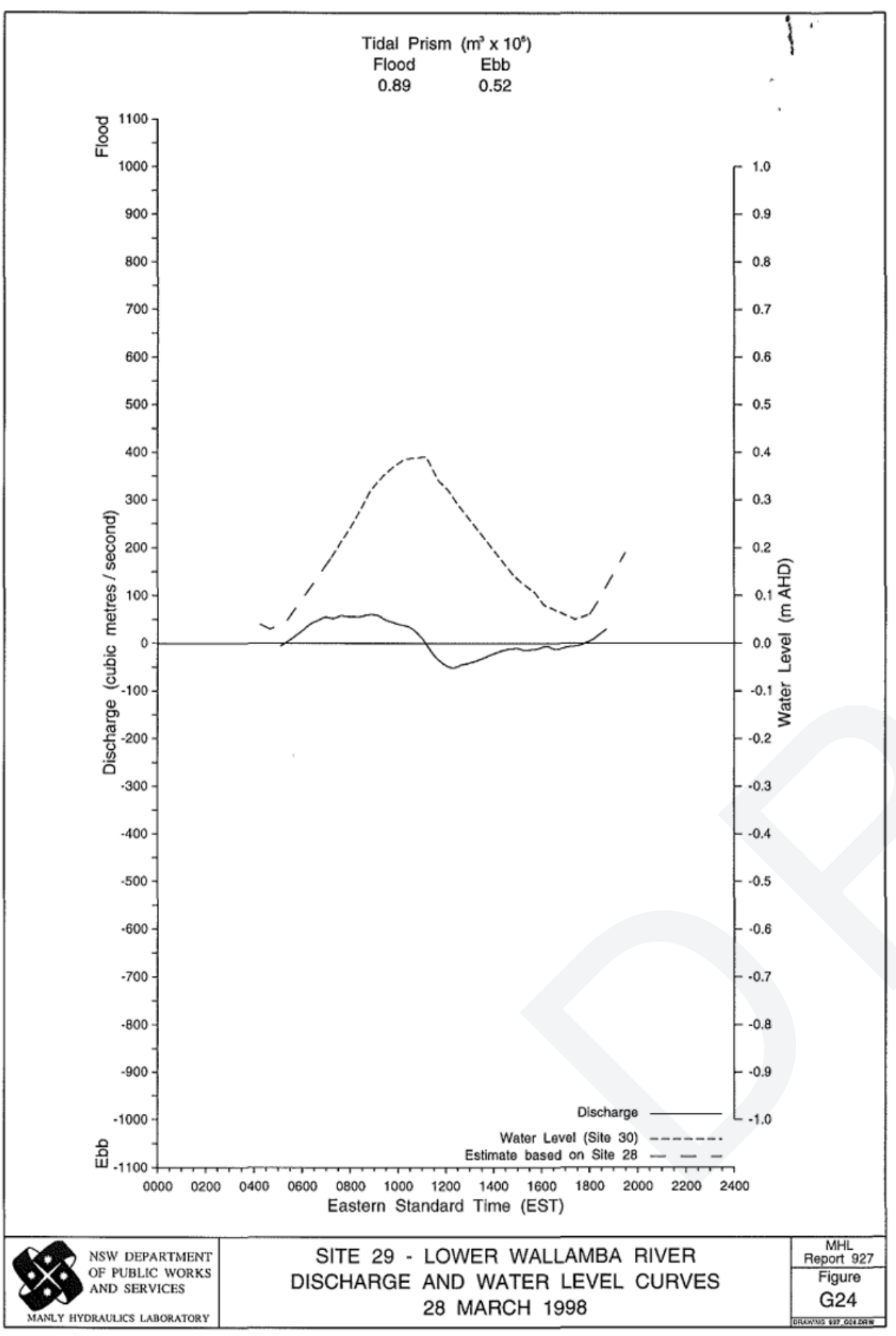

Figure 6: TDV at Lower Wallamba River (Site 29)

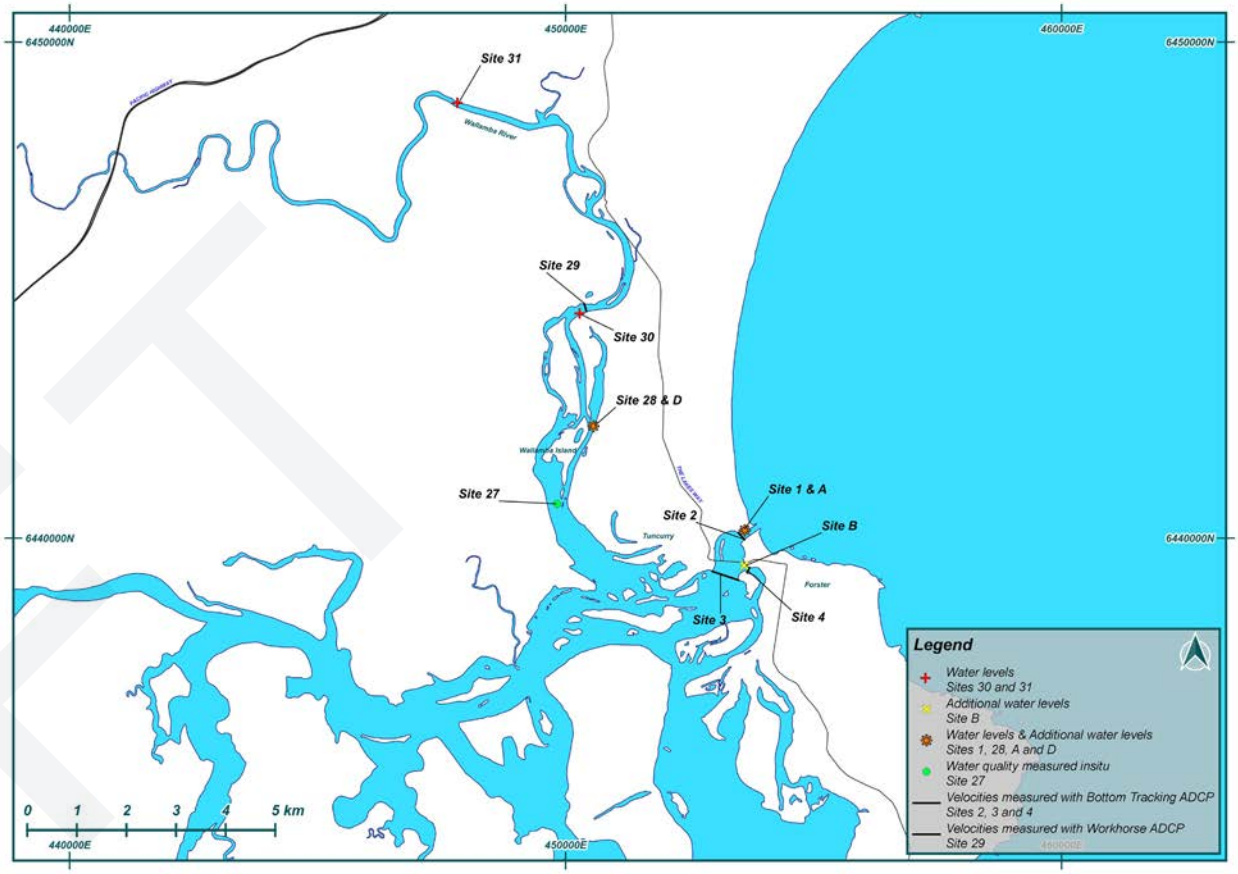

Figure 7: Study sites in the Wallis Lake estuary, including Site 29

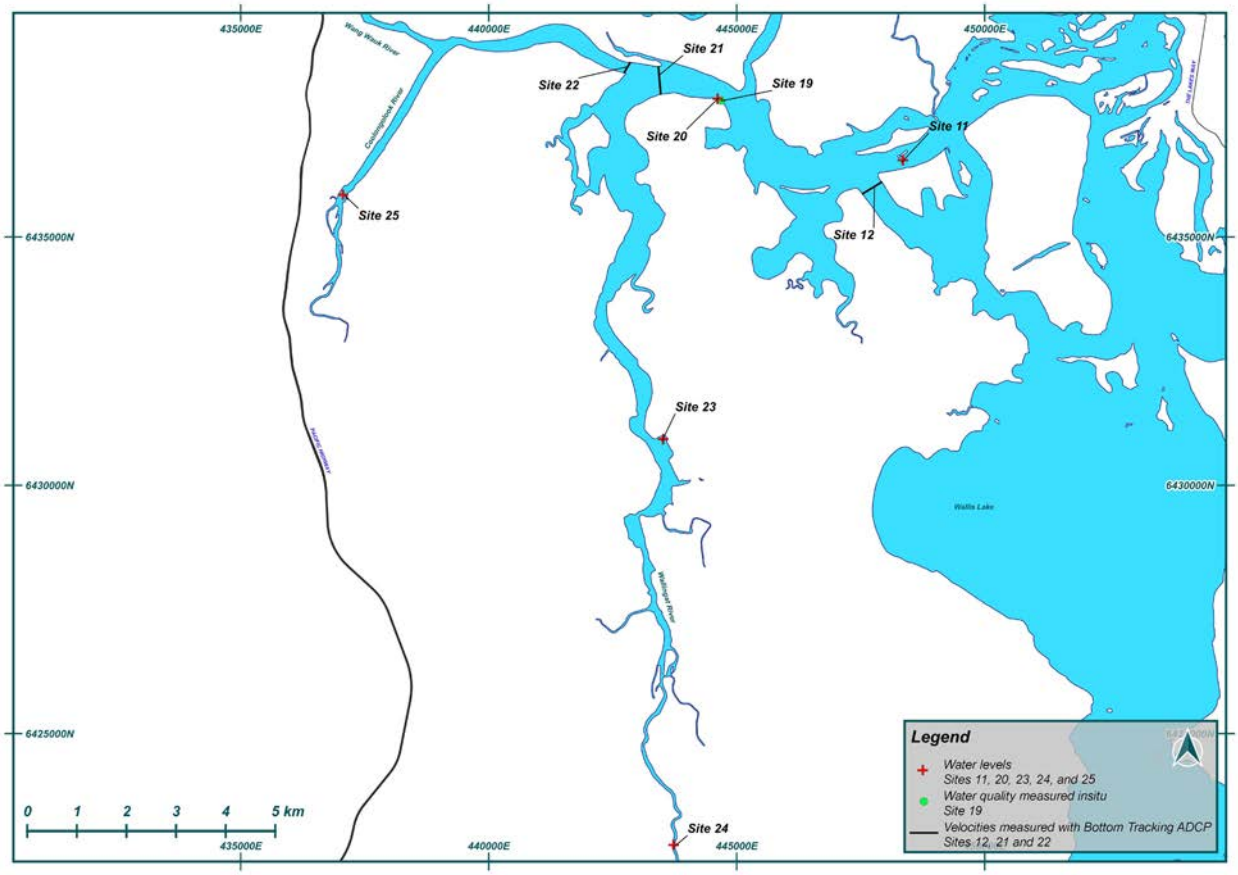

Figure 8: Study sites in the Wallis Lake estuary, including Sites 12 and 22

Manning River estuary

The Manning River estuary forms a complex estuarine system comprising two ocean entrances, branch channels, numerous tributaries and extensive stands of mangroves. The estuary has a total catchment area of 8,320 km^2, which extends 145 km west and 95 km north to south, equating to a total waterway area of approximately 25 km^2. The estuary also contains a large wetland area of approximately 100 km^2 that forms an important habitat for a vast array of aquatic birds. MHL identified four areas with poor tidal discharge flushing, as shown in Figures 9–12.

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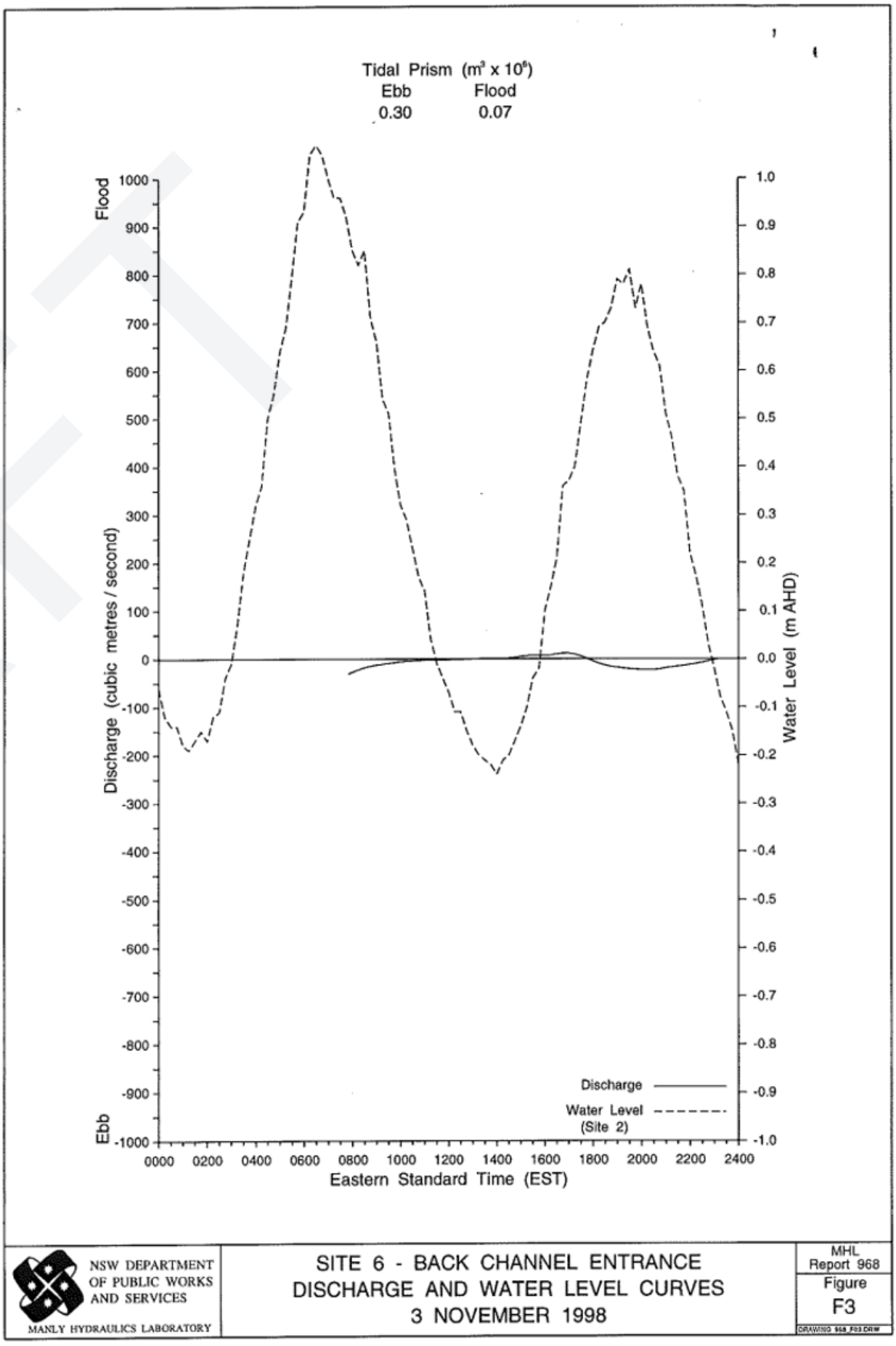

Figure 9: TDV at Back Channel (Site 6)

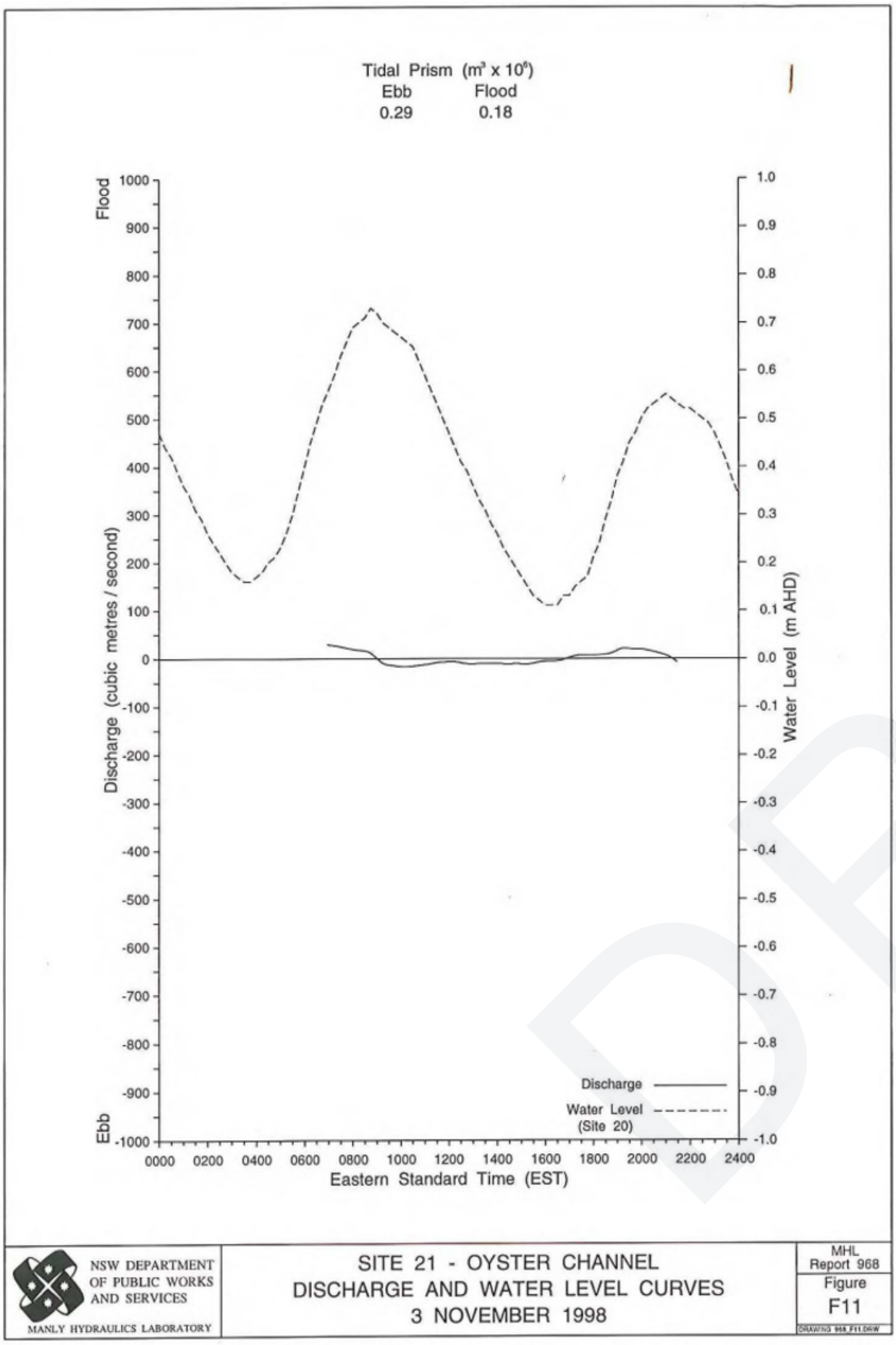

Figure 10: TDV at Oyster Channel (Site 21)

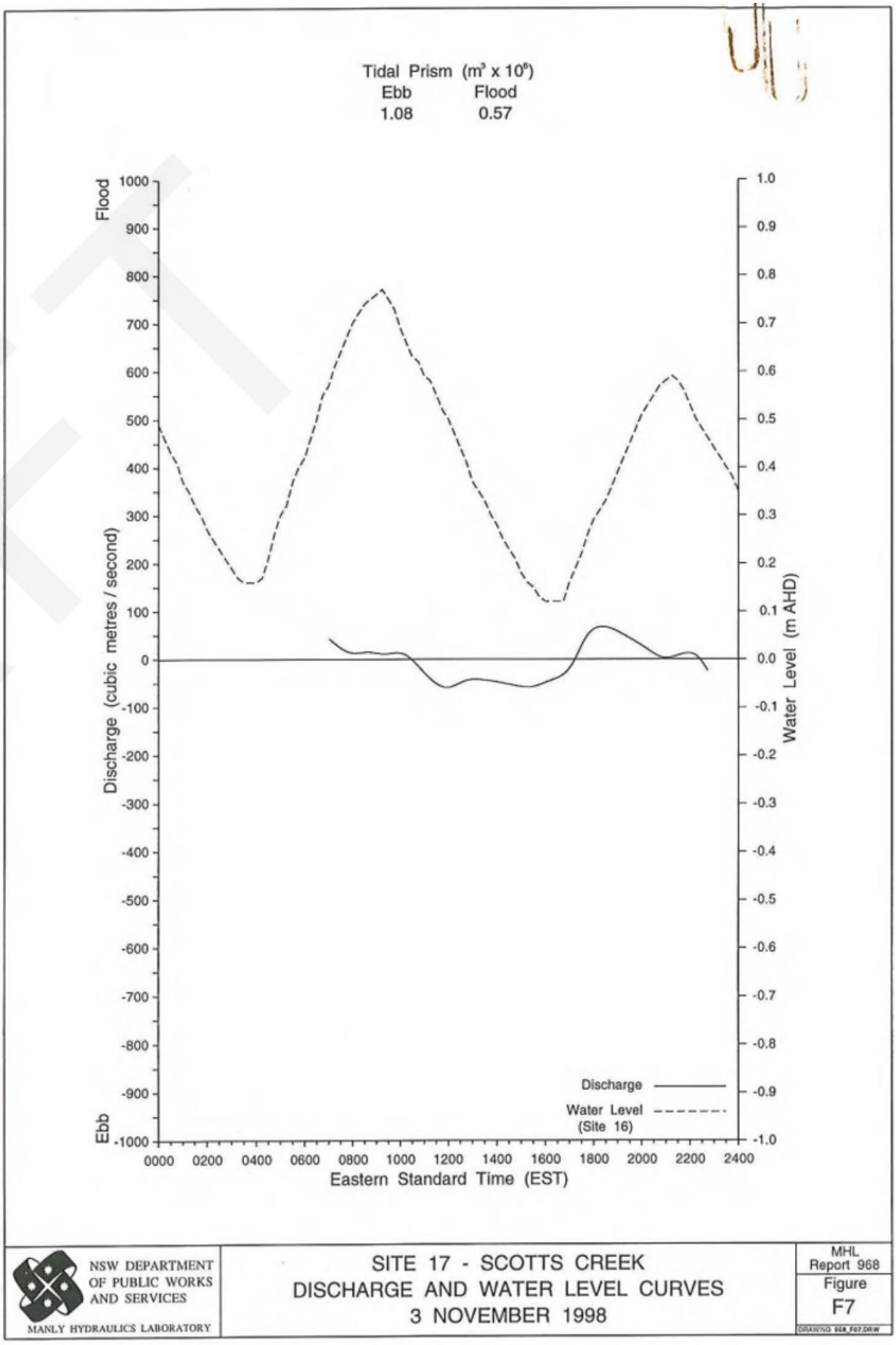

Figure 11: TDV at Scotts Creek (Site 17)

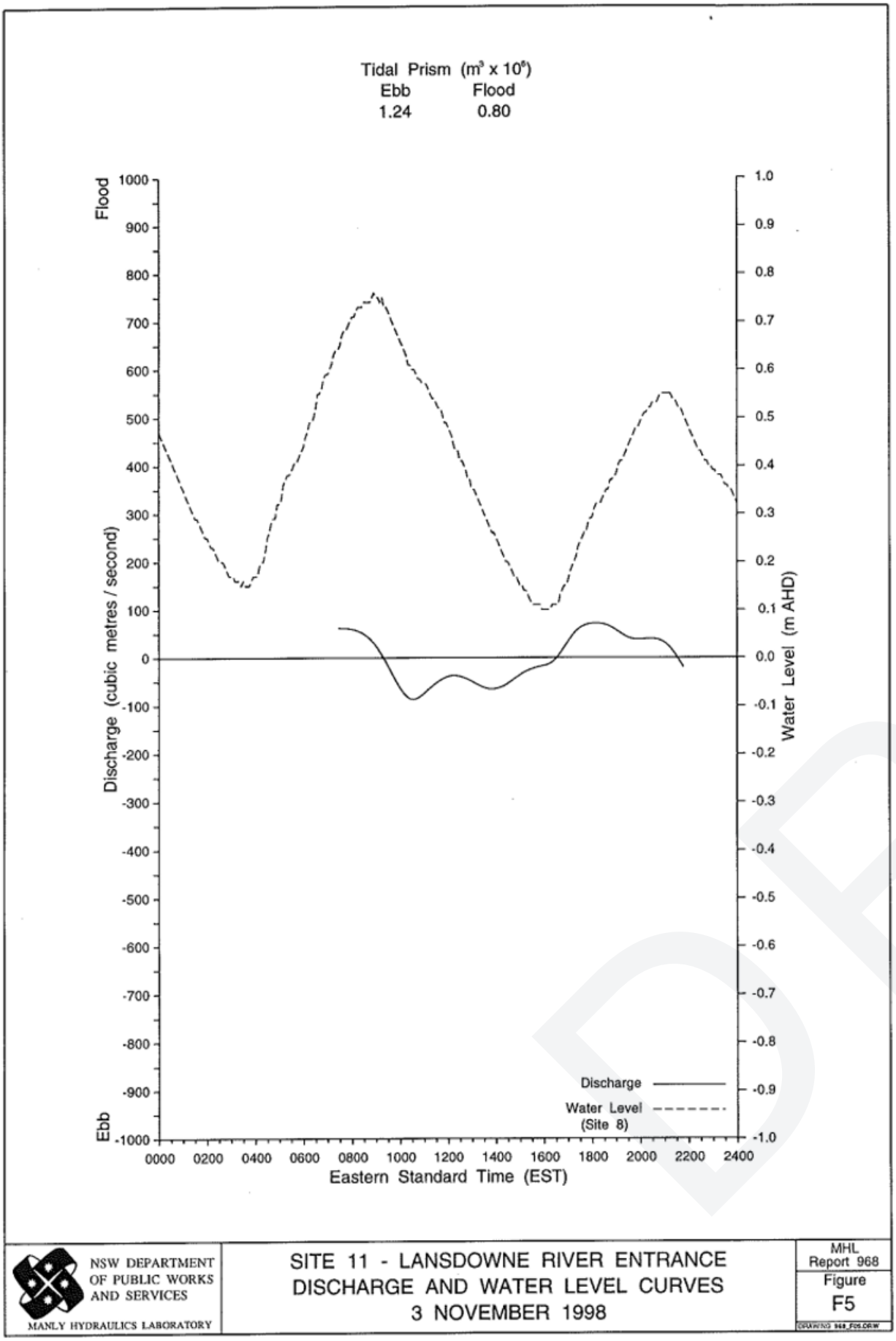

Figure 12: TDV at Lansdowne River (Site 11)

Figure 13: Study sites in the Manning River estuary

4.2.2 RISK ANALYSIS & EVALUATION

Septic systems (treatment facilities and, if installed, effluent disposal areas) close to low TDV areas were identified using Council's mapping and data management systems, and, for the purposes of this preliminary risk assessment, have been treated as being very high risk (VHR) when positioned within 200 metres of a POAA. Table 1 details the potential risks, casual factors and impacts (immediate and cumulative) associated with failing or poorly designed septic systems in these areas. Careful consideration of these is key to formulating a robust monitoring program. The central position presented in this Strategy is that MCC's initial priority should be to identify and rectify failing VHR systems as quickly as possible. Still, it is expected that approximately 40 per cent of systems inspected in the first 12 months will to some extent require follow-up action, which is anticipated to be resource intensive.

Therefore, efforts will be concentrated in areas where the impacts are likely to be greatest, as not all failing systems pose a serious or significant threat to public health and the environment (e.g., a failing system on a large rural allotment, far from surface waters and neighbouring properties). Accordingly, system density (which directly relates to lot sizes), proximity to POAAs and TDVs were the key aspects considered when determining which areas to target initially in the monitoring program. System type and the likelihood of effluent migrating beyond property boundaries and causing harm have also been considered in setting inspection frequencies, which may change after implementing the program based on the relative risk each system poses.

Table 1: Potential risks and impacts associated with septic systems

RISKS	LIKELY CAUSAL FACTORS	IMPACTS
Inadequate regulation	Lack of resources (e.g., funding, time and qualified staff). Poor planning.	Environmental, human health and social
Disinfection failure	No disinfection. Poor pre-treatment. Use of inferior household products. Poor servicing.	Human health
Treatment system failure	Lack of maintenance. Poor installation. Use of inferior household products. Age and type of system.	Environmental, human health and social
Discharge from land application areas	Overloading system. Failure of land application area due to poor design or maintenance.	Environmental, human health and social
Human contact with effluent (direct or indirect)	Lack of knowledge/appreciation of the risks associated with sewage. Poor system design.	Human health and social
Damage to land application area	Vehicles, heavy machinery and/or livestock.	Human health and social
Offensive odours	Poor treatment in the system. Mechanical fault. Use of inappropriate household chemicals.	Social
Groundwater contamination	Land application area overloaded, undersized, or poorly located/designed.	Environmental, human health and social
Surface water contamination	Surface runoff of effluent from land application area. Tank overflows. Illegal discharges.	Environmental, human health and social
Human or animal disease outbreak	Direct or indirect pathogen exposure due to any of the above causes.	Environmental, human health and social
Degradation of soils	Undersized or failing land application system.	Environmental and social
Increased algae growth	Excess nitrate and phosphate in surface waters.	Environmental, human health and social
Degradation of native vegetation	Excess nitrate and phosphate in surface waters and/or soils.	Environmental and social

4.2.3 RISK CONTROL

High-risk systems

The *NSW Oyster Industry Sustainable Aquaculture Strategy 2021 (Fourth Edition)* by the Department highlights actions authorities can take to protect and maintain designated POAAs and public health. For instance, it is recommended that councils develop an OWM strategy and that, as part of the strategy, septic systems close to POAAs are treated as high risk and are inspected yearly (page 25). Moreover, the preferred system type for sites near POAAs is secondary

treatment (aerated wastewater treatment system) with disinfection, subsurface irrigation and a minimum buffer of 100 m to a water body or drain. Where these requirements cannot be met, the Department recommends that additional risk-management measures be incorporated into the design of the system.

As mentioned, systems (not properties, per se) located within 200 metres of a POAA and in areas with low TDV are considered in this Strategy as likely posing the biggest risk to public health and the environment and therefore will be inspected periodically as part of a carefully considered monitoring plan. A broadscale desktop assessment using Council's mapping and data management systems has identified 520 VHR systems, positioned along the Wallis Lake, Port Stephens/Karuah River and Manning River estuaries, as shown in Figures 14–16 on the following pages. The current operational status of most of these systems is unknown, which emphasises the need for immediate attention in these areas. The Department's recommendations, as mentioned above, will be imposed on new systems in aquaculture areas (within 100 m of a permanent watercourse), which not only reduces impacts in the most environmentally sensitive areas but also assists future monitoring efforts.

Systems that pose less risk

After the first 12 months of implementing the monitoring program, system-related factors including type (treatment and disposal), performance (reliability), age and proximity to property boundaries and surface waters will be considered to reduce the inspection frequencies of systems that pose less concern and risk (e.g., aerated wastewater treatment systems with subsurface irrigation serviced quarterly) because inspecting all 520 systems yearly is unlikely to be the best use of Council's resources long term. It is envisaged that these lower-risk systems will be inspected every 24 months, but this is yet to be determined. As mentioned, approximately 40 per cent of systems inspected in the first 12 months will to some extent require follow-up action, which is based on recent field experience in oyster aquaculture areas and because many of these systems have had little regulatory attention over the last 10 years. The amount of follow-up work is expected to fall gradually over the next 5 years but will likely still remain above one in every four systems inspected. Efforts to inspect other systems beyond 200 metres from a POAA or in other sensitive receiving environments in the region will be considered in the future when more is understood about the implications of implementing the monitoring program.

At this stage, systems in less sensitive environments (where the risks to public health and the environment are lower) will be inspected reactively in response to complaints, queries, DAs, section 68 applications (alterations) and pre-purchase inspection applications, unless future resources allow greater regulatory coverage across the region. The demand these activities will place on existing resources cannot be predicted with any degree of certainty, but it is expected that consistently balancing both reactive and proactive activities will still pose a considerable challenge. Therefore, a conservative, step-by-step approach has been adopted in this Strategy to ensure a greater chance of long-term success.

Key performance indicators

Developing and implementing key performance measures will enable accurate reporting and review of the outcomes of this Strategy and will promote continual improvement. Importantly, the key performance indicators detailed in Table 2 offer enough flexibility to allow Council's EHOs to refine monitoring and assessment processes when opportunities arise. It is expected that future OWM strategies will be more prescriptive in nature when more is known about monitoring such a large number of systems.

Table 2: Key performance indicators

TARGET	PERFORMANCE INDICATOR	RESPONSIBILITY
All VHR systems within 200 m of POAA inspected in the first 12 months	Minimum 520 inspections	Monthly reporting to Coordinator On-site Wastewater Management
Decrease in the number of days oyster harvest areas are closed due to microbial contamination	Data obtained from NSW Food Authority and local oyster quality assurance programs	NSW Food Authority to provide monthly data to Coordinator On-site Wastewater Management
Decrease in the number of systems requiring an upgrade or remedial works	Council report on number of systems requiring an upgrade should indicate a decrease year on year	6-monthly reporting to Coordinator On-site Wastewater Management
95% of follow-up inspections completed within reasonable timeframes	95% of follow-up inspections completed in the first 24 months	6-monthly reporting to Coordinator On-site Wastewater Management

While these performance indicators may seem conservative or underwhelming, much effort has been made to avoid overcommitting resources, which is a trap many councils fall into when developing a large-scale OWM strategy such as this. Future strategies are expected to be more robust due to there being a greater understanding of the ramifications of monitoring VHR systems near POAAs and other high-risk areas, especially in terms of resources and meeting community expectations.

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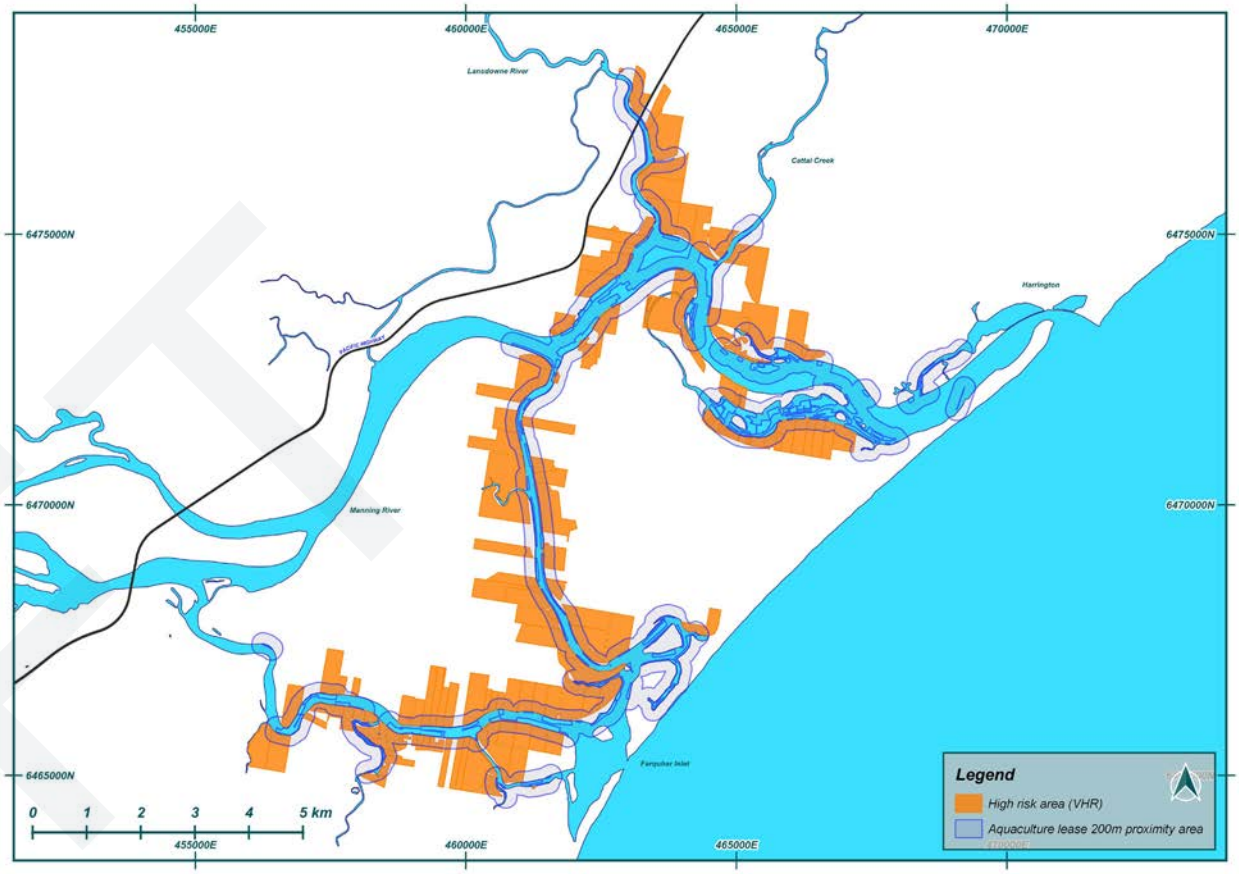

Figure 14: VHR areas near the Manning River estuary

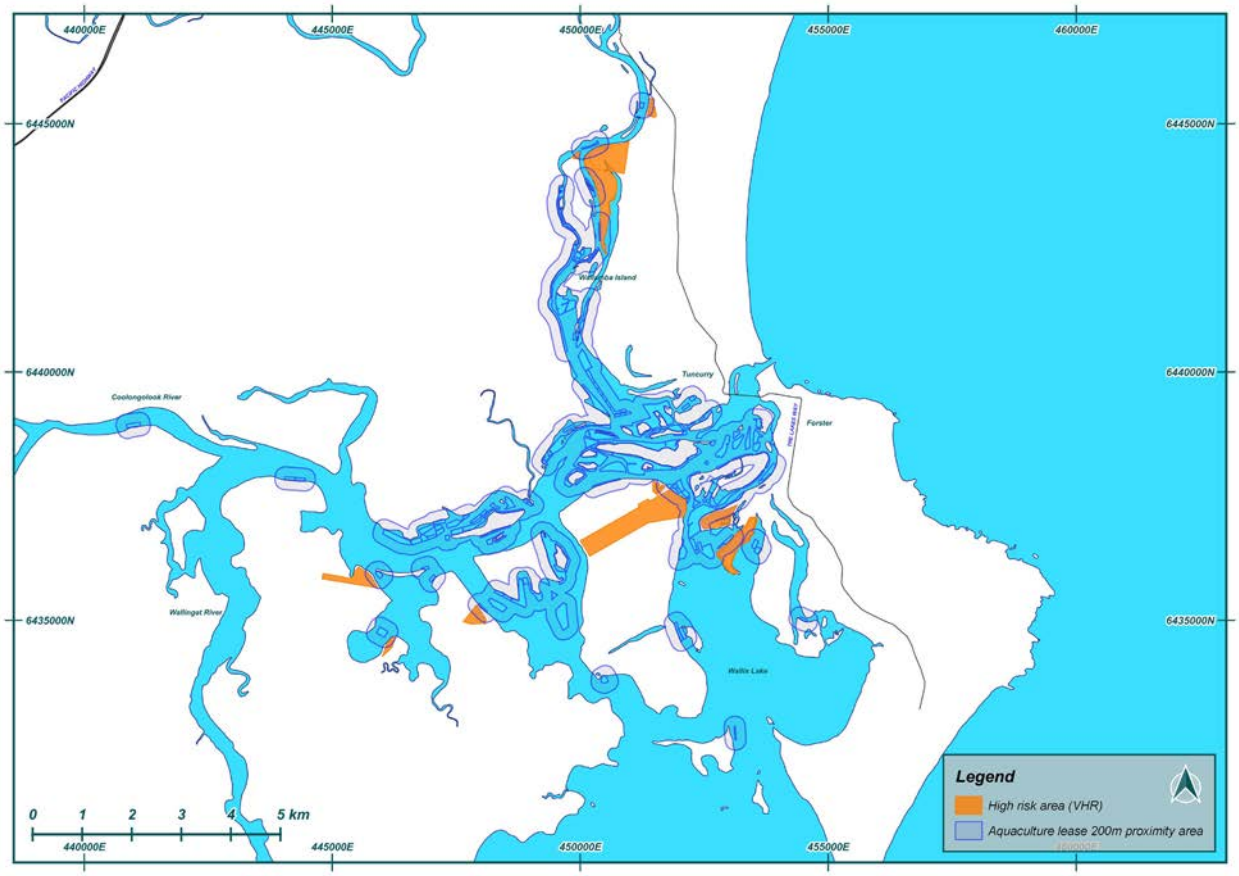

Figure 15: VHR areas near the Wallis Lake estuary

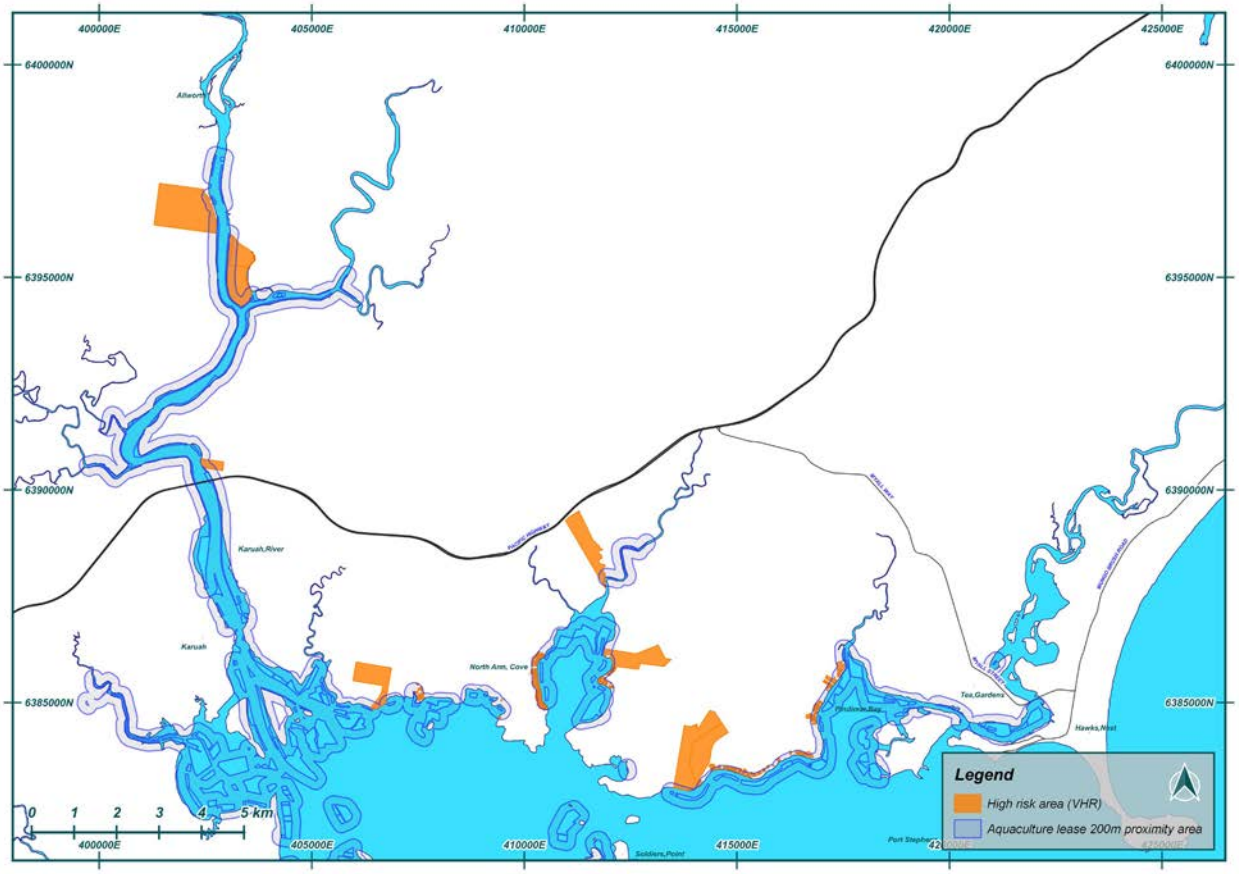

Figure 16: VHR areas near the Port Stephens/Karuah River estuary

Figures 14 to 16 show areas in the Manning River, Wallis Lake and Port Stephens/ Karuah River estuaries with low TDV. Allotments with septic systems within 200 m of a POAA are featured in orange (approximately 520). Please note that many of these allotments cannot be viewed at this scale, but officers will use Council's mapping and data management systems to identify systems in preparation for the proactive inspections. Data collected from the inspections will be instrumental in refining procedures and processes and shaping future OWM strategies.

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5. COMPLAINTS

Complaints vary in frequency and nature and often require substantial time and effort to resolve long term. This is because matters are typically resolved only temporarily, resurfacing every few weeks or months with more complexity.

Often, complaints are more about a civil dispute between neighbours or unrealistic expectations than they are about valid threats to public health and the environment. For these reasons, managing complaints will always be challenging and reactionary in nature and cannot be planned for entirely with regard to resources. Ideally, matters should not be given more regulatory attention than they deserve, which is not always easy to determine without first completing an inspection, which could entail several hours of an officer's time. Therefore, Council's officers should take a calculated and measured approach when responding to complaints relating to OWM.

Such an approach will be based on the risk and likelihood of an activity causing serious or significant harm to public health and the environment. Matters deemed as requiring further investigation and possibly enforcement action will be investigated promptly and efficiently, but regard will be given to an offender's circumstances before any enforcement action is taken to resolve harmful or potentially harmful activities. In other words, officers will balance the needs of the individual against those of the wider community, which should be communicated clearly and early to complainants to set realistic expectations.

6. COMPLIANCE & ENFORCEMENT

As mentioned, it is expected that many septic systems across the region would fail to meet the performance standards specified in the Regulation. Careful consideration, therefore, must be given to managing noncompliance and community expectations to meet the objectives outlined in this Strategy.

Council's On-site Wastewater Management Section has adopted an escalating enforcement policy, whereby voluntary compliance is generally encouraged and obtained in the first instance using an educational and facilitative approach to resolve matters that pose a minor or negligible threat to public health and the environment. Officers may choose to issue fines, notices and orders under the Act, Regulation and POEO Act where such action is considered commensurate with the seriousness of an activity or where efforts to encourage voluntary compliance to resolve a threat or problem have obviously failed.

In addressing noncompliance, officers should ensure that they have taken a calculated and measured approach, balancing the needs of the individual against those of the wider community. Furthermore, officers should strive for favourable outcomes and positive relationships in the community, which requires a keen sense of perspective and knowing when flexibility and discretion will likely lead to better long-term outcomes than a firmer regulatory approach will. Noncompliance will therefore be managed thoroughly and sensitively on a case-by-case basis because a 'one-size-fits-all' approach is likely to disadvantage some community members, especially those who have little financial means to fully comply with the latest OWM standards. Hence, meeting the objectives in this Strategy will be a balancing act that will likely require refinement over time, which will be addressed in future strategies.

6.1 Enforcement options for addressing potentially harmful activities

The following table details the enforcement options available to Council's authorised officers when addressing activities that potentially pose a threat to public health or the environment, especially those of a serious nature. Council's EHOs will treat the firm enforcement actions as a last resort after carefully considering the implications and likely ramifications of an activity.

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Table 3: Compliance options for addressing problematic OWM activities

ACTIVITY	RELEVANT LEGISLATION (SECTION/CLAUSE)	POSSIBLE ACTION
Installing a system without approval	The Act (68)	Issue penalty notice
Altering a system without approval	The Act (68)	Issue penalty notice
Operating a system without approval	The Act (627), Regulation (44), POEO Act (96)	Issue penalty notice
System failing (polluting)	95% of follow-up inspections completed in the first 24 months	Issue penalty notice under the Act or a notice under the POEO Act
Diverting greywater (polluting)	The Act (627), Regulation (44), POEO Act (96)	Issue penalty notice under the Act or a notice under the POEO Act

6.2 Matters to consider before taking enforcement action

The NSW Ombudsman's *Enforcement Guidelines for Councils* published in 2015 is a valuable resource for authorised officers in local government. It details the matters that should be considered before taking enforcement action to resolve noncompliance. These include the following:

6.2.1 SERIOUSNESS OF THE BREACH

Not all breaches pose a significant or serious threat to public health or the environment, which needs to be at the forefront of an officer's mind when investigating matters. Therefore, it is important that officers consider the level, impact and consequences (known or potential) of an activity and whether the breach is only technical and inconsequential or if approval would likely have been given if it were sought. Officers should also consider whether the breach can be easily remedied.

6.2.2 OFFENDER CULPABILITY

Officers should also consider whether a breach was committed knowingly or recklessly and whether the person is likely to repeat offences in the future. This may be difficult to determine in all cases, but some people have a well-documented history of noncompliance, suggesting that they have a blatant disregard for Council's requirements and authority as well as the safety and interests of the wider community. Officers should also determine whether personal hardship factors would likely prevent an offender from complying.

6.2.3 APPROPRIATENESS

As mentioned, actions taken by officers should be reasonable and commensurate with the level of risk to public health and the environment. Officers should also consider whether the enforcement action would encourage behaviour change, remediate the damage caused and/or eliminate any economic advantage the person gained by avoiding compliance. Furthermore, enforcement should be consistent with previous actions for similar offences.

6.2.4 PUBLIC INTEREST

Officers should ensure that actions taken are in the public interest in terms of benefits and costs, the likeliness of success, impacts to Council's resources, the effect of the outcomes and potential to deter similar offences in the future.

6.2.5 ESTOPPEL

Officers need to consider whether any actions taken have given the impression that no enforcement action would be taken for an offence. This could include 'Estoppel by Laches', where a delayed response may be construed as Council not regarding the offence as serious in nature and worth pursuing. Therefore, it is important that officers have a good sense of awareness of how their actions and language may be perceived by the public.

6.2.6 LEVEL OF EVIDENCE

Finally, officers need to determine whether there is sufficient evidence to warrant enforcement action. In other words, can the offence be proven 'beyond reasonable doubt' (in criminal proceedings) or 'on the balance of probabilities' (for civil proceedings), should a matter end up in a court of law. While Council is not generally in favour of court proceedings, the seriousness of some offences may justify such action, especially when an offender refuses to cooperate and the threat to public health and the environment is too great to ignore. Nevertheless, officers should aim to collect and examine evidence objectively when investigating complaints, even for seemingly trivial threats to public health and the environment. Such an approach will ensure officers do not fall into the habit of treating people and matters rashly and unfairly.

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7. COMMUNITY EDUCATION

Education should form the backbone of any compliance strategy, as most people are willing to do the right thing when they understand the importance of following legislative requirements and industry practices.

Efforts should be made to ensure OWM approvals and communications with the public are clear, accurate and helpful, which is expected to reduce confusion and noncompliance, improve understanding of OWM and potentially save the community time and money. Therefore, all written communications with the public pertaining to OWM (i.e., approvals, letters, emails and Council's website) will be reviewed regularly for accuracy and helpfulness, and a digital copy the Department of Local Government's *The Easy Septic Guide*, which many householders may find informative, will be provided to property owners with the ATO or renewal certificate. Officers will also aim to educate the community about the latest OWM requirements and standards as part of the monitoring program, which in many cases will entail face-to-face communication with residents during inspections. Consideration should also be given to hosting educational workshops at Council venues.

8. STAFF REQUIREMENTS

It is vital that this Strategy is implemented by skilled environmental health professionals who hold suitable university qualifications and who have adequate experience in environmental management matters, ideally in a regulatory capacity.

Because of the number of septic systems in environmentally sensitive areas in the region, Council has established an On-site Wastewater Management Section within the Building and Environmental Health Services Department, comprising EHOs and Business Support Officers who specialise in OWM.

Such dedication of resources to OWM is crucial for ensuring that Council meets its legislative obligations and that staff have adequate expertise to solve complex OWM matters thoroughly, efficiently and consistently. Although knowledge and skills gained through on-the-job experience are in many respects superior to that obtained through the completion of tertiary courses and training programs, staff will be encouraged to attend useful industry-specific courses that are held by reputable training organisations (e.g., the Centre for Environmental Training). It is also important that shared leadership is encouraged to promote team collaboration, problem-solving, decision making and a shared set of values and beliefs, which is likely to improve knowledge sharing and performance in the On-site Wastewater Management Section and will be important for ensuring this Strategy is successful. Accordingly, professional development is expected to occur largely as a by-product of being part of a positive, competent and collaborative team focused on improvement.

9. REVIEW

This Strategy will be reviewed in the last quarter of 2024 and a new strategy will be presented to Council for adoption in the first quarter of 2025.

As mentioned, the implications and ramifications of the details in this Strategy cannot be known in advance with a high degree of certainty. Therefore, this Strategy is merely a starting point for managing OWM systems across the region, offering enough flexibility for officers to refine monitoring and assessment processes as necessary to improve outcomes. Data collected during the implementation of this Strategy will be pivotal for shaping future strategies.

10. CONCLUSION

Such a substantial number of septic systems in the region calls for a strategic approach to manage the risks and cumulative impacts associated with failing or poorly designed systems, especially in highly sensitive receiving environments.

A preliminary risk assessment has revealed that 520 systems close to POAAs in the Wallis Lake, Port Stephens/Karuah River and Manning River estuaries are likely to present the greatest risk and therefore should be inspected as part of a carefully considered monitoring program, which can be expanded in the future to include systems of lower risk (e.g., systems beyond 200 m from POAAs). It is expected that many systems in these areas would fail to meet the performance standards in the Regulation and that an estimated 40 per cent of systems inspected in the first 12 months will require follow-up action to varying degrees. Therefore, careful attention has been given to managing resources and community expectations to ensure Council is successful in mitigating serious or significant threats to public health and the environment in the future.

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