

Floodplain risk management





Harwood and Lower Clarence in flood

Floodplain risk management

NSW Public Works is uniquely equipped to provide a broad range of engineering services across the state, assisting clients to plan for and manage flood risk across existing communities and new developments.

We have a state-wide network of experts who can undertake the planning, design, procurement, and project management of complex flood-related infrastructure. These projects require innovative thinking, highly developed stakeholder management and effective communication skills.

NSW Public Works has deep knowledge and experience in preparing flood studies, floodplain risk management studies and plans, flood mitigation options analysis and feasibility studies. We undertake investigations and prepare designs for flood mitigation and water quality infrastructure. These may include levees, dams, bank protection works, urban stormwater detention basins, bio-retention works and constructed wetlands.

NSW Public Works is at the forefront of technological advances for inspecting and auditing flood-related infrastructure. During flood emergencies, levee dam inspections and site visits can be undertaken by regional-

based staff, or with technology such as drones or remotely through video calls, with outputs easily understood by emergency management personnel.

We have procurement specialists in regional locations, enabling us to use local knowledge when preparing tender and engagement documents to design and construct flood mitigation options.

Our floodplain risk management capabilities support the NSW Public Works Environment and Planning Team with flood impact assessments and the development of strategic planning documents and planning controls as they relate to floodplain risk management.

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Infrastructure Planning & Flood Risk
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Our expertise

NSW Public Works provides clients with **tailored solutions** to support their **planning, infrastructure, and floodplain risk management requirements.**



Rocky Creek Dam and spillway

- Strategic floodplain risk management advice for land use planning
- Flood impact assessment
- Input to planning controls
- Stormwater drainage design
- Management of floodplain risk management studies and plans
- Floodplain risk management options assessment and feasibility assessment
- Project management
- Design and construction management of floodplain risk management infrastructure including levees
- Levee audit and inspections
- Dam break assessment
- Flood mapping
- Flood modelling
- Flood emergency response planning
- Engineering emergency management, including levee and dam inspections
- Flood emergency response recovery and clean up

Front cover: Lismore in flood, 2022

Emergency engineering management

Client: State Emergency Service (SES), Regional NSW local governments
Location: All NSW
Services: Flood impact predictions, in-flight levee assessments, emergency levee repair advice

In the 2022 flood event, the NSW Public Works Engineering Emergency Management team assessed urban levees in southern and central NSW for their structural integrity and the likelihood of failure. This included Barham, Moulamein, Hillston, Curlwaa, Moama and Narrandera levees. The work involved onsite inspections of the levee banks and used previous inspection data and drone and video footage of the current condition. Using this assessment, an Interim Flood Confidence Level for the levee was determined using a risk analysis approach, which the NSW SES uses as the limit above which the risk to human life is considered unacceptable. This methodology has been used across the state to evacuate towns and allow residents in other towns to remain and shelter-in-place during flood events. The resulting advice was provided to local councils and the NSW SES.



NSW urban levee audits

Client: Department of Planning, Industry and Environment
Location: All NSW
Services: Levee audits and inspection, input to levee owner’s manuals

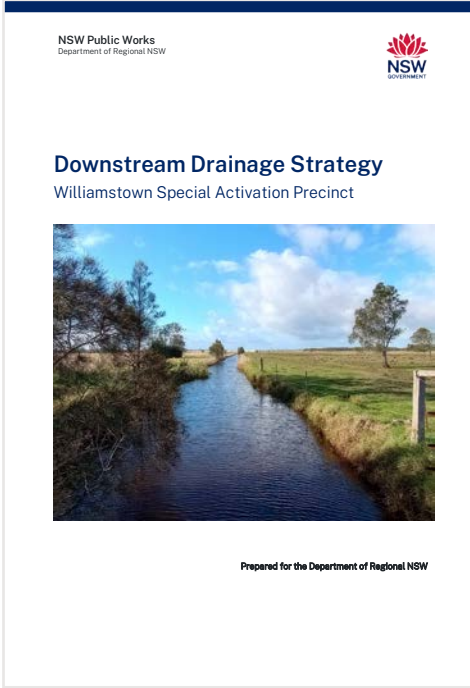
NSW Public Works has worked collaboratively with the Department of Planning, Industry and Environment (DPIE, now DPE) to undertake visual audits of levees across NSW. These audits enabled NSW Public Works to identify if a levee is defective or under threat of failure and recommend remediation works to ensure it continues functioning to its design criteria. Reports and information are accessible to levee owners to incorporate into their asset and levee management procedures can be used to develop information to assist levee owners with a comprehensive approach to managing levees within NSW.



Strategic floodplain advice to NSW Government departments

Client: Department of Regional NSW
Location: Moree and Williamtown Special Activation Precincts
Services: Technical and strategic floodplain risk management advice

For the Strategic and Final Business Cases for the Moree and Williamtown Special Activation Precincts, NSW Public Works provided strategic floodplain risk management advice and conducted a technical review of studies and plans by consultants for the concept designs and cost estimates. Technical specialist review fields included transport, flooding, watercycle management, hydrology, geotechnical, contamination, hydrogeology, construction management, bushfire, and Aboriginal and non-Aboriginal heritage. The technical review included options for flood planning levels and potential fill heights to facilitate development commensurate with the existing and future flood risks across Williamtown SAP, having regard to Council’s flood related development controls and Fullerton Cove tailwater levels.



Drainage channel in Williamtown

Floodplain risk management studies for Parkes Shire Council

Client: Parkes Shire Council
Location: Parkes
Services: Procurement of consultant, project management of technical studies and consultants, technical and strategic floodplain risk management advice, strategic planning advice

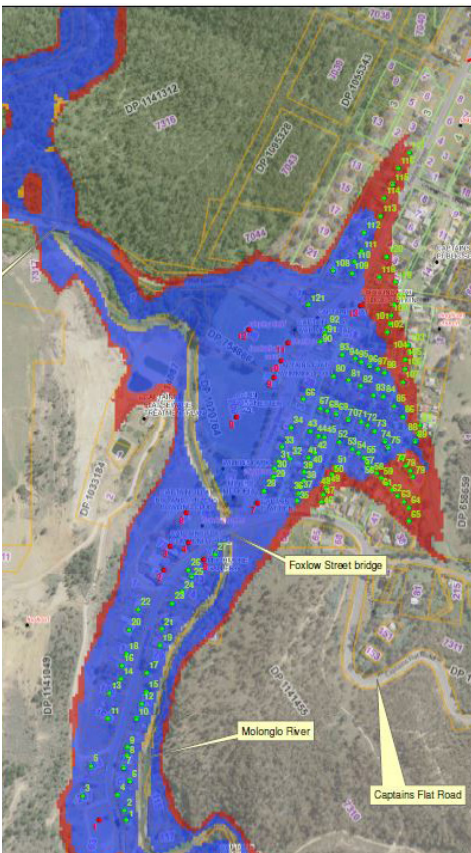
NSW Public Works provided project management services to Parkes Shire Council to complete flood studies, floodplain risk management plans and feasibility studies for projects that received funding through the NSW State Floodplain Management Program. As part of this work, we developed procurement documentation to engage a qualified consultant to undertake the technical flood study and project managed this consultant as they undertook the work, including a technical review of deliverables. NSW Public Works is also providing strategic floodplain risk management advice as part of Councils Strategic planning activities for the urban growth of Parkes



Captains Flat Dam dambreak and potential loss of life (PLL) studies

Client: Queanbeyan-Palerang Regional Council
Location: Captains Flat Dam, Queanbeyan
Services: Dambreak and Potential Loss of Life studies

NSW Public Works conducted a dambreak and Potential Loss of Life (PLL) study for Captains Flat Dam in 2004 and updated it in 2021 due to new data. As part of the study, flood inundation mapping was prepared to assess the consequences of potential dam failures for areas downstream of the structure. The revised 2021 study re-determined the consequence category from HIGH C to HIGH A as stipulated by the Dams Safety Regulation 2019. The change reflected the increased risks of the dam because of the increased population at risk over 17 years. The category assists with determining the required dam safety design parameters and enables the NSW State Emergency Service to plan dambreak flood evacuation procedures.



Nimmie-Caira Interim Land Management REF

Client: Department of Primary Industries (Water)
Location: Gayini (Nimmie-Caira)
Services: Environmental impact assessment, by preparing a Review of Environmental Factors and engaging subconsultants for specialist biodiversity and Aboriginal cultural heritage assessments

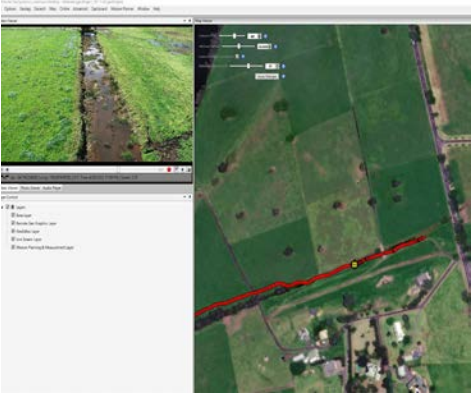
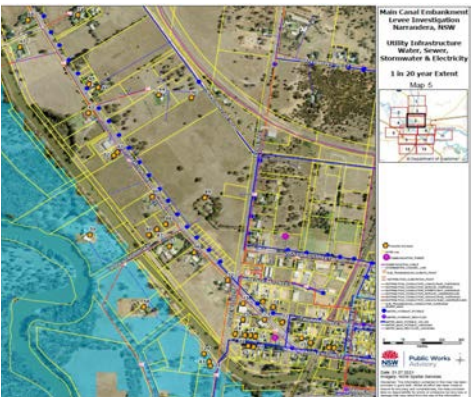
Spread over 84,000 hectares, Gayini (Nimmie-Caira) is on the lower reaches of the Murrumbidgee River floodplain. It comprises floodplain and wetlands systems of national and international significance, providing habitat, breeding and nursery grounds for fish, water birds and migratory species and significant indigenous cultural heritage values. NSW Public Works was engaged by the Department of Primary Industries (Water) to prepare a Review of Environmental Factors (REF) for a series of interim land management works that were urgently required to manage the property responsibly and facilitate the Nimmie-Caira Enhanced Water Delivery Project. This included bank grading and repair of water delivery channels, track grading, fence construction and repairs, construction of firebreaks and pest eradication.



Floodplain mapping using leading technologies

Client: Shoalhaven City Council
Location: Bomaderry / Nowra
Services: Survey, spatial and property

NSW Public Works needed to identify locations along the drainage network where possible defects could cause issues when flooded, as part of the Shoalhaven Flood Mitigation Drains -Visual Inspection Summary Report 2023. NSW Public Works applied video geocoding (through Linevision) to captured imagery and drone footage to supplement oblique imagery and ground data collection. We matched the flight path to the corresponding section of the video to plot defect locations along the drainage lines. These defects were input into Fulcrum and turned into a report. All data compiled and created is available in ArcGIS Online WebApps and ArcGIS Pro with Image Analyst extension.



Hunter Valley Flood Mitigation Scheme

Client: NSW Department of Planning and Environment
Location: Hunter River
Services: Engineering emergency management, emergency levee inspections, project management

The Hunter Valley Flood Mitigation Scheme is an integrated system designed to mitigate flood risk, benefitting more than 250,000 people across the Hunter River catchment. NSW Public Works was engaged by the NSW Department of Planning and Environment (DPE) to assess damage to property and infrastructure as a result of significant flooding experienced across the catchment during 2021 and 2022. NSW Public Works inspected the riverbanks and levees and made recommendations for immediate repairs and planned future maintenance works. Following this, NSW Public Works were engaged to provide project management services for immediate urgent repair works across the catchment. Working in consultation with DPE Water, NSW Public Works will undertake planning, investigation, design, procurement, and manage the construction works to repair the remaining critical flood-damaged riverbanks and levees, including future capital works programs at various locations within the catchment.



Jenolan Caves floodplain risk management

Client: Jenolan Caves Reserve Trust (JCRT)
Location: Jenolan Caves Reserve
Services: Project management floodplain study and risk management plan, including procurement and management of consultant

JCRT engaged NSW Public Works to project manage the first flood study and flood risk management plan for the Jenolan Caves Reserve, focusing on the visitor use and services zone. Given the site's unique historical, cultural and natural value, the outcomes of this work will assist the Trust in managing the existing drainage infrastructure and implementing the Jenolan Caves Grand Arch Precinct Master Plan. The project will also investigate how the JCRT can incorporate resilience into future designs and construction. As part of this work, NSW Public Works developed the procurement documentation to engage a qualified consultant to undertake the study, and project managed this consultant as they undertook the work, including technical review of deliverables.



Hunter Valley flood migration scheme - horseshoe bend stage 1 completion

Why choose NSW Public Works?



**Accredited
for planning
and delivery of
capital works**

NSW Public Works is accredited under the NSW Government Agency Accreditation Scheme for Construction to manage the planning and delivery phases of construction and capital works procurement. NSW State and Local Government entities can directly engage the services of NSW Public Works under the provision of NSW Government Procurement Board Direction PBD 2020-04 and Section 55 of the Local Government Act 1993, providing efficiencies and cost savings.



**Strong focus
on quality,
environmental
and safety
management**

NSW Public Works operates under triple certification for quality, occupational health and safety (WHS) and environmental (QSE) management systems. These systems and processes provide the foundation for delivering quality projects and a continuous improvement culture, that embraces QSE leadership at all levels and integrates QSE into all activities. NSW Public Works' Project Management Framework is the backbone of our quality system and is used to manage our projects and ensure we deliver to agreed requirements.



**State-wide
resources**

Regional clients benefit from our state-wide network of offices enabling them to source expert project management personnel familiar with the conditions and construction industry issues in their area. This proximity reduces servicing costs, facilitates improved stakeholder communications and enables us to respond quickly to your needs, providing a single point of contact for all services.



**Government
relationships
and knowledge**

Successful delivery of complex infrastructure projects relies on effective interaction with stakeholders and regulatory government agencies. NSW Public Works' unique position within NSW Government enables us to bridge the gap between our clients and Government stakeholders to ensure necessary consultations and approvals are undertaken efficiently and effectively.



Managed risks

We place considerable emphasis on advising clients of their risks on projects, including the options and costs to manage these risks. Wherever possible, risks are identified early and inform our planning and procurement strategy development processes. Risks are continuously monitored and updated as projects progress and discussed and managed with clients and contractors.

Working across NSW

HUNTER NEW ENGLAND REGION

Newcastle
117 Bull Street
Newcastle West NSW 2302

Tamworth
155-157 Marius Street
Tamworth NSW 2340

Inverell
240 Byron St
Inverell NSW 2360

Armidale
85 Faulkner St
Armidale NSW 2350

NORTH COAST REGION

Lismore
120 Dally Street
Lismore NSW 2480

Coffs Harbour
359 Harbour Drive
Coffs Harbour NSW 2450

Port Macquarie
Level 2, 41-47 Horton Street
Port Macquarie NSW 2444

SYDNEY METRO REGION

Parramatta
4 Parramatta Square
12 Darcy Street
Parramatta NSW 2150

The Rocks
66 Harrington Street
Sydney NSW 2000

SOUTH COAST REGION

Wollongong
Level 3, Block E
84 Crown Street
Wollongong NSW 2500

Goulburn
Suite 5, 167 Auburn Street
Goulburn NSW 2580

Moruya
66 Campbell Street
Moruya NSW 2537

Queanbeyan
Ground Floor East
11 Farrer Place
Queanbeyan 2620

Nowra
5 O'Keefe Avenue
Nowra NSW 254

RIVERINA/WESTERN REGION

Bathurst
Level 1, 346 Panorama Avenue
Bathurst NSW 2795

Dubbo
34 White Street
Dubbo NSW 2830

Broken Hill
Level 1, 32 Sulphide Street
Broken Hill NSW 2880

Griffith
104 - 110 Banna Avenue
Griffith NSW 2680

Wagga Wagga
2-6 Coleman Street
Wagga Wagga NSW 2650

Dareton
1998 Silver City Highway
Dareton NSW 2717



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