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| **Cluster** | Climate Change, Energy, the Environment and Water |
| **Agency** | Department of Climate Change, Energy, the Environment and Water |
| **Division/Branch/Unit** | Water / Natural Resources Access Regulator |
| **Location** | Negotiable / Parramatta |
| **Classification/Grade/Band** | Clerk Grade 9-10 |
| **Role Family** *internal use only* | Bespoke/Information & Communication Technology/Delivery |
| **ANZSCO Code** | 234111 |
| **PCAT Code** | 1119192 |
| **Date of Approval** | October 2022, updated February 2024 |
| **Agency Website** | https://www.dcceew.gov.au/ |

*Ensuring a sustainable NSW through climate change and energy action, water management, environment and heritage conservation and protection.*

Who we are

The NSW Department of Climate Change, Energy, the Environment and Water (DCCEEW) works to protect the state’s environment and heritage. It leads the way on climate change, driving the sustainable transition to a net zero economy, powered by affordable, reliable, and clean energy.

DCCEEW conserves and protects the state’s natural environment. It manages the NSW national park estate, including its rich and diverse biodiversity and Aboriginal cultural heritage for future generations.

DCCEEW also ensures sustainable management of water resources across the state, to support the environment, communities and industry.

We acknowledge the ongoing custodial responsibilities of the Aboriginal peoples of NSW to care for Country and water and are committed to establishing meaningful partnerships with Aboriginal peoples in the management of the environment.

Water brings communities together; keeps industries moving and sustains life. It has significant cultural and environmental value with an estimated market value of more than $29 billion in NSW. When it's taken unlawfully, we lose more than just the water.

NRAR enforces the NSW water laws and offers guidance and education to help water users comply, and undertakes detailed spatial analyses to both proactively detect and deter potential non-compliance.

We strive to be an efficient and effective regulator that celebrates and reflects the diversity of the community we serve.

Working with NRAR provides the Senior Project Officer an opportunity to use their applied spatial science, hydrology and remote sensing skills to make sure that water is used lawfully so that all communities and the environment get a fair share.

Primary purpose of the role

The primary purpose of this role is to undertake a detailed evaluation of NRARs recently developed farm-scale water balance compliance monitoring tool known as EXTRACTOR. The EXTRACTOR tool was developed for NRAR from Commonwealth funding by Professor Albert van Dijk and Dr Pablo Larraondo. At its simplest, the tool enables comparisons, at a retrospective annual time step, of per-property total metered water take volumes from NSW Government databases vs per-property Sentinel satellite estimates of irrigated crop water requirements and on-farm storage volume changes.

EXTRACTOR is thus designed to facilitate the proactive detection of potentially non-compliant, large volume, unmetered water take within project-based areas of interest (AOIs) across the NSW Murray-Darling Basin (MDB). This role will require the development of carefully curated metered water take extraction point and property ownership polygon datasets as geodatabases within ArcGIS/PRO for selected project AOIs, and then utilizing these curated data sets within the EXTRACTOR tool, to compare metered water take volumes vs EXTRACTOR estimated take volumes. An essential output from this role is to lead the publication of the results of the EXTRACTOR tool evaluation within the peer-reviewed scientific literature while working in collaboration with NRAR staff, Professor Albert van Dijk and Dr Pablo Larraondo.

# Key accountabilities

* Provide specialist GIS, hydrological and remote sensing expertise to support the integration, high-end manipulation and analysis of metered water take, remotely sensed imagery, cadastral and other data using GIS software (ArcGIS/PRO) and EXTRACTOR, including publication of analysis results in the peer reviewed scientific literature.
* Work with the EXTRACTOR developers to extend the applicability of EXTRACTOR to the NSW southern MDB regulated river water sharing plans (lower Darling, Murray, Murrumbidgee and Lachlan) and assess various crop evapotranspiration assessment methods against metered water take data.
* Contribute to NRAR GIS projects and programs, including through ArcGIS Online, ESRI Field Apps and Portal, to support delivery and enhancement of spatial and data analytics opportunities beneficial to NRAR.
* Provide technical advice on GIS, spatial data analysis and management, remote sensing, automation, interoperability and web mapping to contribute to decision making in natural resource management and water compliance.
* Acquire, analyse, model and interpret GIS, remotely sensed, metered water take and water entitlement allocation data and assess its effectiveness in monitoring and detecting potential non-compliance in water take and volumes and associated infrastructure at local, regional and statewide scales.
* Research, define, review and develop standards, operating procedures and best practice appropriate to spatial analysis methods and maintain, update and disseminate spatial data, ensuring quality, currency and accuracy of data and its adherence to appropriate standards.

Key challenges

* Working independently with new, leading-edge technologies to analyse complex water resource management issues across large spatial scales but at the granularity of individual farms and water extraction metering sites.
* Leading the research and peer reviewed publication of EXTRACTOR analysis results in collaboration with NRAR staff, Professor Albert van Dijk and Dr Pablo Larraondo.

Key relationships

| Who |  Why |
| --- | --- |
| **Internal** |  |
| Manager Spatial and Data Analytics | * Seek and receive guidance and provide regular updates on the EXTRACTOR tool evaluation, analysis and publication status
* Seek and receive guidance, contribute to and support NRARs spatially focussed projects and programs
* Seek and receive guidance to ensure the successful delivery of identified project outcomes, including the development of peer reviewed publications
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| Teams | * Work collaboratively with the Spatial and Data Analytics Team to develop and refine project-based spatial data sets for upload into EXTRACTOR
* Work collaboratively with the Spatial and Data Analytics Team to update and extend the NRAR Storage Volume Curve library for floodplain harvesting capable dams across the NSW Northern MDB using the ON-FARM WATER STORAGE EXPLORER tool
* Participate in meetings to represent work group perspective and share information
* Participate in discussions and decisions regarding the implementation of innovation and best practice in enterprise GIS solutions and spatial science
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| Stakeholders | * Provide expert advice on GIS and spatial science related issues
* Consult and collaborate to resolve project related issues, define mutual interests and determine strategies to achieve their realisation
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| **External** |  |
| Clients | * Determine external user requirements to maximise user experience and facilitate easy access to internal and external geospatial, water licensing, water accounting, water monitoring and water compliance data through DCCEEW and NRAR spatial systems
* Consult and collaborate to resolve project and program related issues in relation to data access and system integration to achieve required project and program outcomes and timeframes
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| External contractors and consultants | * Lead external contractors and consultants on spatial system enhancement and development, including procurements as required
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# Role dimensions

## Decision making

* The role is an authoritative source of advice and expertise on spatial data and spatial analyses for NRAR.
* The role has a high level of autonomy and is accountable for the delivery of work assignments and projects on time, within budget and to expectations in terms of quality, deliverables and outcomes.
* Identifies the priority requirements of internal and external stakeholders that require action.
* Recommends changes to information management practices or deployment of new technologies, with changes subject to discussion and approval by senior management.

## Reporting line

This role reports to the Manager Spatial and Data Analytics

## Direct reports

Nil

## Budget/Expenditure

Nil

Knowledge and experience

* Extensive experience in GIS, remote sensing, hydrology, spatial analysis and modelling research and peer review publication of research results
* Experience in the automation of processes, through scripting or batch job creation, as well as the visualisation, presentation and interpretation of spatial information.
* Experience in development and maintenance of enterprise GIS and web mapping solutions and applications.
* Experience or expertise to undertake NRAR Legal and/or Crown Solicitors Office expert witness analyses and reporting on water take matters that are the subject of NRAR investigations and/or legal proceedings.

Essential requirements

* Relevant Honours, Masters or PhD degree level tertiary qualification in Spatial Sciences, GIS, remote sensing, Science, Natural Resources or related discipline or equivalent experience.
* Demonstrated research-by-thesis experience, including publication of first author scientific papers

## Capabilities for the role

The [NSW public sector capability framework](https://www.psc.nsw.gov.au/workforce-management/capability-framework/the-capability-framework) describes the capabilities (knowledge, skills and abilities) needed to perform a role. There are four main groups of capabilities: personal attributes, relationships, results and business enablers, with a fifth people management group of capabilities for roles with managerial responsibilities. These groups, combined with capabilities drawn from occupation-specific capability sets where relevant, work together to provide an understanding of the capabilities needed for the role.

The capabilities are separated into **focus** capabilities and **complementary** capabilities.

## Focus capabilities

*Focus capabilities* are the capabilities considered the most important for effective performance of the role. These capabilities will be assessed at recruitment.

The focus capabilities for this role are shown below with a brief explanation of what each capability covers and the indicators describing the types of behaviours expected at each level.

## Focus capabilities

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| **Capability group/sets** | **Capability name** | **Behavioural indicators** | **Level** |
| personal-attributes | **Manage Self**Show drive and motivation, an ability to self-reflect and a commitment to learning | Keep up to date with relevant contemporary knowledge and practicesLook for and take advantage of opportunities to learn new skills and develop strengthsShow commitment to achieving challenging goalsExamine and reflect on own performanceSeek and respond positively to constructive feedback and guidanceDemonstrate and maintain a high level of personal motivation | Advanced |
| relationships | **Communicate Effectively**Communicate clearly, actively listen to others, and respond with understanding and respect | Tailor communication to diverse audiencesClearly explain complex concepts and arguments to individuals and groupsCreate opportunities for others to be heard, listen attentively and encourage them to express their views Share information across teams and units to enable informed decision making Write fluently in plain English and in a range of styles and formats Use contemporary communication channels to share information, engage and interact with diverse audiences | Adept |
| relationships | **Work Collaboratively**Collaborate with others and value their contribution | Encourage a culture that recognises the value of collaborationBuild cooperation and overcome barriers to information sharing and communication across teams and unitsShare lessons learned across teams and unitsIdentify opportunities to leverage the strengths of others to solve issues and develop better processes and approaches to workActively use collaboration tools, including digital technologies, to engage diverse audiences in solving problems and improving services | Adept |
| results | **Think and Solve Problems**Think, analyse and consider the broader context to develop practical solutions | Undertake objective, critical analysis to draw accurate conclusions that recognise and manage contextual issuesWork through issues, weigh up alternatives and identify the most effective solutions in collaboration with othersTake account of the wider business context when considering options to resolve issuesExplore a range of possibilities and creative alternatives to contribute to system, process and business improvementsImplement systems and processes that are underpinned by high-quality research and analysisLook for opportunities to design innovative solutions to meet user needs and service demandsEvaluate the performance and effectiveness of services, policies and programs against clear criteria | Advanced |
| business-enablers | **Technology**Understand and use available technologies to maximise efficiencies and effectiveness | Identify opportunities to use a broad range of technologies to collaborate Monitor compliance with cyber security and the use of technology policies Identify ways to maximise the value of available technology to achieve business strategies and outcomes Monitor compliance with the organisation’s records, information and knowledge management requirements | Adept |
| business-enablers | **Project Management**Understand and apply effective planning, coordination and control methods | Understand all components of the project management process, including the need to consider change management to realise business benefitsPrepare clear project proposals and accurate estimates of required costs and resourcesEstablish performance outcomes and measures for key project goals, and define monitoring, reporting and communication requirementsIdentify and evaluate risks associated with the project and develop mitigation strategiesIdentify and consult stakeholders to inform the project strategyCommunicate the project’s objectives and its expected benefitsMonitor the completion of project milestones against goals and take necessary actionEvaluate progress and identify improvements to inform future projects | Adept |

## Complementary capabilities

*Complementary capabilities* are also identified from the Capability Framework and relevant occupation-specific capability sets. They are important to identifying performance required for the role and development opportunities.

Note: capabilities listed as ‘not essential’ for this role are not relevant for recruitment purposes however may be relevant for future career development.

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| **Capability group/sets** | **Capability name** | **Description** | **Level** |
| personal-attributes | Display Resilience and Courage | Be open and honest, prepared to express your views, and willing to accept and commit to change | Adept |
| personal-attributes | Act with Integrity | Be ethical and professional, and uphold and promote the public sector values | Adept |
| personal-attributes | Value Diversity and Inclusion | Demonstrate inclusive behaviour and show respect for diverse backgrounds, experiences and perspectives | Intermediate |
| relationships | Commit to Customer Service | Provide customer-focused services in line with public sector and organisational objectives | Adept |
| relationships | Influence and Negotiate | Gain consensus and commitment from others, and resolve issues and conflicts | Adept |
| results | Deliver Results | Achieve results through the efficient use of resources and a commitment to quality outcomes | Adept |
| results | Plan and Prioritise | Plan to achieve priority outcomes and respond flexibly to changing circumstances | Adept |
| results | Demonstrate Accountability | Be proactive and responsible for own actions, and adhere to legislation, policy and guidelines | Intermediate |
| business-enablers | Finance | Understand and apply financial processes to achieve value for money and minimise financial risk | Intermediate |
| business-enablers | Procurement and Contract Management | Understand and apply procurement processes to ensure effective purchasing and contract performance | Intermediate |