Capability Statement

in 2 Dredging

Solutions adding value

ECAAS QUALITY MANAGEMENT ISO 9001 CERTIFIED

ECAAS ENVIRONMENTAL MANAGEMENT ISO 14001 CERTIFIED

ECAAS SAFETY MANAGEMENT ISO 45001 CERTIFIED

in2Dredging
Solutions adding value

Company Profile

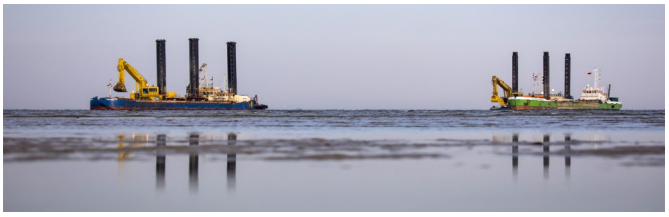
in2Dredging Pty Ltd (i2D) is an independent consultancy specialising in dredging, offering a broad range of services internationally. These include project management, engineering, estimating, environmental services, geographic data processing, dispute resolution, training and Research, Development and Innovation. As part of ongoing RD&I initiatives, i2D develops inhouse software tools to provide unique and reliable services, some of which are made available commercially.

Dredging Consultancy Services

Founded in 2016 and headquartered in Perth, (i2D) is a specialist dredging consultancy. i2D provides expert services to a wide range of clients, including contractors, consultants, port operators and authorities, mining and renewable energy companies, as well as local governments.

i2D operates under a certified Integrated Management System (IMS), which encompasses Quality, Health, Safety and Environment. Our IMS has been certified to internationally recognised ISO 9001:2015, 14001:2015 and 45001:2018 standards. Designed to be cloud-based and fully paperless, i2D's IMS enables seamless remote work from anywhere in the world.

With extensive knowledge and in-depth expertise in dredging, i2D supports projects from the earliest conceptual stages through to successful delivery. The i2D team, located across Australia and internationally, is committed to delivering high-quality services on time and on budget.



Dredging involves the excavation, transportation or placement of soil and/or rock mainly underwater.

Our dredging consultancy services include:

- End-to-end project management across all dredging project phases, from conceptual phases to detailed design through to tender preparation and project execution.
- Advanced multidisciplinary dredging engineering services in areas such as:
  - Soil-water interaction
  - Dredging and coastal processes
  - Control systems
  - Pipeline Engineering
- Reliable dredging production and cost estimates.
- Management of programmes to improve operational performance.
- Deployment of unique, state-of-the-art inhouse estimating tools based on advanced modelling techniques as well as extensive field experience.
- Delivery of cutting-edge RD&I initiatives, enabling the delivery of value adding dredging solutions.
- Provision of dredging dispute resolution and expert witness services, backed by over 80 years combined specialised industry experience.

Share your challenges with us and let us surprise you with solutions that add value!

Capabilities

i2D is a state-of-the-art independent dredging consultancy providing international dredging support. Our team specialises in securing approvals for marine projects and developing innovative solutions for dredging operations and equipment design.

i2D's main strength lies in its dual-perspective experience delivering projects from both the dredging contractor's and client's sides. Our core team brings together decades of combined expertise in both dredging contracting and consultancy, enabling a balanced and practical approach to project delivery.

We possess in-depth knowledge across a wide range of dredging and placement methods, including trailer suction hopper dredgers, cutter suction dredgers, water injection dredgers, bucket, grab, environmental and backhoe dredgers, mechanical and jetting trenchers, as well as fall pipe and side dump vessels. Moreover, i2D has specialised expertise in pipeline and booster pump configurations.

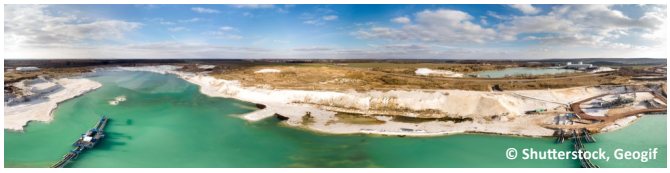
Our solutions are based on a unique combination of academic knowledge and extensive field experience. This is evidenced in the advanced software tools we develop, which play a central role in our engineering and estimating services.

i2D offers a suite of proprietary software tools for client use and project support. These include the Estimator for Dredger series, whose tools are applicable to most commonly used dredgers, as well as the Pumps 'n Pipeline tool, among many others.

To further enhance project delivery, i2D has at its disposal an extensive network of dredging and environmental professionals and has affiliations with a select group of trusted subcontractors. For each project, i2D assembles a fit-for-purpose team tailored to the project's specific requirements, ensuring services are delivered to a consistently high standard.

Our services are founded on eight pillars, which deliver:

- **Project Management**
  High quality, on time and on budget.
- **Advanced Engineering**
  Multidisciplinary and practical solutions.
- **Reliable Estimating**
  Realistic production and cost estimates.
- **Insightful Geographic Data Processing**
  Visualise any large dataset to gain insight.
- **Environmental Services**
  Approvals delivered on time with plans that control risk.
- **Research, Development and Innovation**
  Efficient and accurate tools, which underpin i2D's service excellence
- **Dispute Resolution and Expert Witness Services**
  Impartial, data driven resolutions.
- **Comprehensive Dredging Training Courses**
  Equip participants with vital skills and knowledge in the field of dredging.



i2D Dredging
Solutions adding value

Project Management

i2D's dredging team is equipped to support and/or manage all project phases from iniital concept and detailed design through to tender preparation and project execution. The team's academic knowledge and field experience enables i2D to realise safe, cost-effective and successful high quality projects.

The i2D team builds bridges between clients, contractors and engineers.

Our dredging expertise is based on a systematic design approach that delivers successful and innovative projects. The i2D team possess the skills and experience to undertake the following tasks across the design, feasibility, options assessment and execution phases of dredging projects.

Conceptual Design

- Plan site investigations, including soil sampling, geotechnical and metocean assessements, bathymetric surveys and environmental studies.
- Assess dredgeablity and recommend approapriate dredging equipment.
- Estimate production levels and project costs.
- Establish initial dredge levels and slopes.
- Identify key stakeholders and regulatory bodies.
- Establish realistic project schedules.
- Conduct preliminary technical and economic feasibility studies.
- Identify potiential project risks and opportunities.

Front End Engineering Design (FEED)

- Develop soil models based on geohistorical, geophysical and geotechnical data.
- Determine workability based on metocean data.
- Calculate dredge volumes using bathymetric data and design parameters.
- Generate accurate and realistic estimates of production rates and project costs.
- Prepare Invitations to Tender (ITT) and supporting documentation.
- Conduct detailed feasibility studies.
- Undertake environmental monitoring and impact assessments studies
- Prepare clear and concise tender documents.
- Assess and evaluate tender submissions.
- Inform stakeholders.
- Identify project risks and opportunities, and develop effective and achievable safequards.

Detailed Design

- Refine and address risks and opportunities identified during the FEED phase.
- Develop accurate as-built drawings.
- Prepare detailed specifications and project-specific contractual documents.

Project Execution

- Manage contractors.
- Represent clients and supervise equipment.
- Monitor performance and permit compliance.
- Deliver safety programmes.
- Administer contracts.
- Action resolutions and manage variations.
- Verify realised designs.

Project Evaluations

- Resolve disputes, claims and variations.
- Provide expert witness and arbitration assistance.
- Facilitate and document lessons learnt sessions.

Advanced Engineering

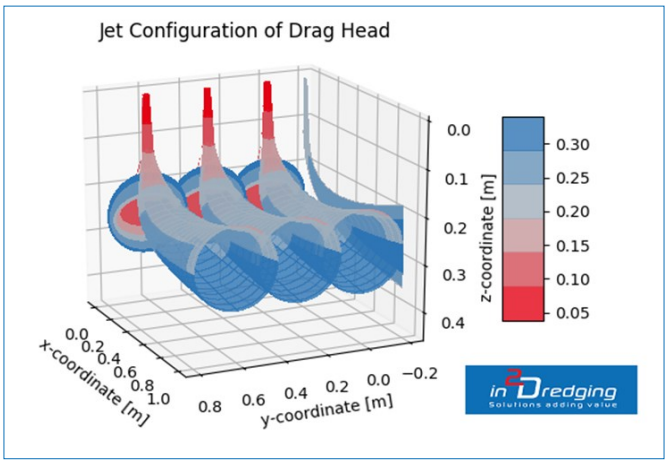
i2D delivers advanced inhouse multidisciplinary engineering, with professional expertise spanning civil, mechanical and control system engineering. The engineering team combines technical specialisation with a strong foundation in fundamental physics, enabling them to develop practical models and innovative software tools tailored to rea-world dredging applications.

i2D's engineers have developed and refined both physical and numerical models that are continuously improved based on insights gained from new field experiences. In support of efficient project execution, the i2D team has also developed proprietary software that enables rapid and comprehensive engineering calculations.

i2D has engineering capabilities in the following fields.

Advanced Dredging Engineering

i2D possesses unique, up-to-the-minute knowledge of dredging processes, enabling the team to design, optimise and enhance dredging operations. This includes providing expert advice on modifying and upgrading dredging installations such as pumps, pipelines and engines, with a primary focus on maximising equipment performance.



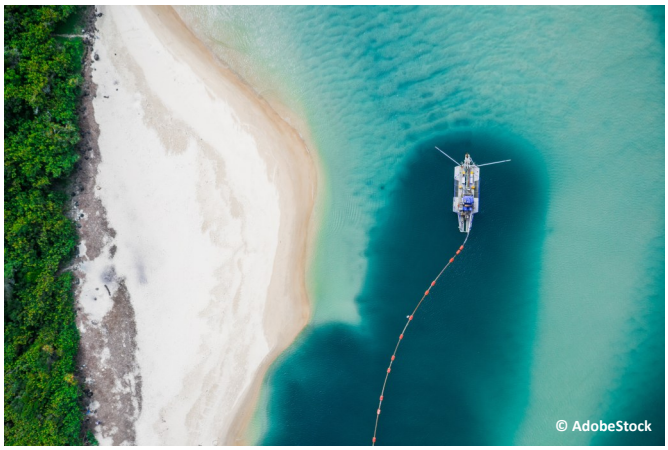
Soil-Water Interaction Engineering

Dredging inherently involves complex soil-water interactions and the unique science of destructive and underwater geotechnical engineering.

i2D's team applies advanced modelling techniques to simulate and predict cutting, jetting or blasting of various soil and rock types. These predictive models are embedded in our inhouse estimation tools.

Coastal Engineering

i2D's engineers conduct environmental impact assessments and analyse and estimate performance for a range of dredging equipment under different hydrodynamic conditions. Our expertise extends to hydrographic survey consulting, using specialised hydrographic software to validate bathymetric data, assess dredge volumes and verify design compliance.



Control System Engineering

i2D designs and implements control systems aimed at optimising production efficiency. In addition, the team provides operator training and clear communication to ensure effective use and integration of control systems in dredging operations.

Geographic Data Processing

The volume of digital geographic data that dredging projects generate can seem vast, with the data often requiring significant geographic data processing before it can be meaningly interpreted and utilised.

To address this, i2D has pre-invested in tools designed to expedite the processing of the large datasets produced by Geographic Information Systems (GIS). These tools support rapid and flexible processing of these large datasets through advanced coordinate and data transformation methods.

Geographic datasets that could benefit dredging projects include:

- Bathymetric surveys
- Dredging design files
- Geotechnical and geophysical investigations
- Satellite imagery
- Operational performance monitoring data

i2D's tools easily integrate multiple data sources, presenting them in a single graph, potentially providing groundbreaking insights on certain dredging projects throughout all project phases, from concept development to project execution and even dispute resolution.

i2D's geographic data processing tools provide valuable insights into:

- Soil quantity and quality, including the likelihood of encountering challenging soil conditions.
- Data accuracy, quality and coverage.
- Relationships between physical parameters and confidence levels.
- Operational efficiency and performance.
- Habitat distribution and mapping.

In addition, i2D's geographic data processing tools can deliver indisputable, data-driven evidence of events taking place on dredging projects.

Bathymetric Surveys

Bathymetric survey data is essential for estimating and monitoring underwater dredging operations. i2D's hydrographic surveying solutions include:

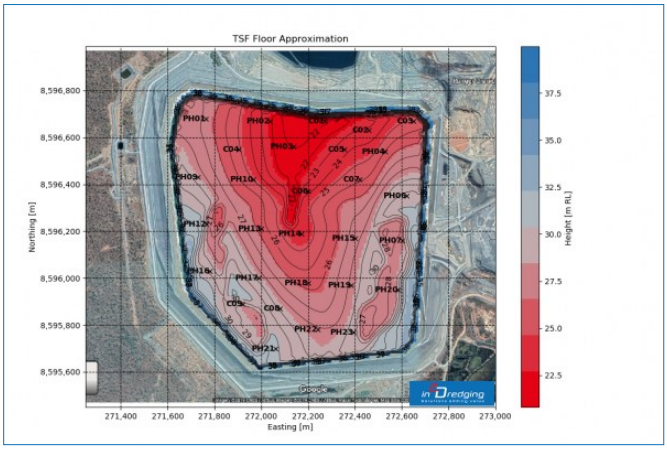
- Calculation and visualisation of dredge volumes
- Review, interpretation and verification of survey datasets
- Single beam and multibeam bathymetry data processing.

i2D can also prepare survey specifications and act as a client representative. Moreover, i2D can combine bathymetric survey data with other datasets, such as geophysical data or satellite imagery, to simplify data interpretation.

Geotechnical and Geophysical Investigations

Soil investigations are vital for mitigating delays and cost overruns in dredging projects. High quality geotechnical data, focused on key soil parameters, coupled with accurate production estimates, contribute to reliable budgeting and timely execution.

Moreover, to help clients avoid unnecessary soil investigations and their associated costs, i2D specify the investigations required to effectively determine production estimates.



in 2D redging
Solutions adding value

Environmental Services

Environmental protection is a fundamental aspect of i2D's operations. We undertake marine investigations and environmental studies to support dredging projects, ensuring that baseline environmental conditions are known and that potential impacts are assessed prior to commencement of any works. i2D is committed to delivering outcomes that minimise environmental disturbance.

Given that dredging activities typically occur in coastal or estuarine environments, a deep understanding of local physical processes is essential. Consequently, i2D conducts comprehensive environmental impact assessments and analyses to realistically estimate dredging equipment performance within specific marine settings.

Our environmental services include:

- Securing necessary dredging and disposal permits for dredging projects or marine developments, as well as marine disposal activities.
- Conducting environmental studies and coordinating required environmental monitoring programmes.
- Developing and implementing detailed surveys and studies that inform to broader Environmental Impact Assessments (EIA) or Statements (EIS).
- Defining accurate source terms and modelling the behaviour of dredge plumes, including their potential environmental footprint and deposition patterns.
- Coordinating and conducting required sediment investigations to assess the contaminant status of dredged material and determine appropriate dredged material disposal options.
- Designing reclamation areas, including fill and settling basins, tailored to project and environmental requirements
- Predicting the quality of return water discharged back into the environment.
- Compiling project-specific Environmental Management Plans (EMP), and Dredge and Disposal Management Plans.

i2D can operate as part of a multidisciplinary team or manage a team of specialists to deliver required environmental investigations.

Worried about show-stoppers? We have the experience to help you proceed

Dispute Resolution and Expert Witness Services

With over 80 years of combined specialised experience in the dredging industry, i2D is uniquely positioned to provide high-level support in dispute resolution and expert witness matters. Our broad and in-depth expertise across multiple dredging disciplines is a key asset in resolving disputes.

i2D's Expert Witness Knowhow

Simon Burgmans, i2D's Director and Principal Dredging Engineer, brings extensive global experience in delivering high-quality dredging consultancy services. His combination of extensive academic knowledge and practical insights into the complexities of dredging equip him to deliver expert witness services of the highest standard. Simon's background allows him to offer clients authoritative, credible and impartial opinions on complex dredging matters.

Simon has also completed the Expert Determiner's course formally qualifying him as an expert witness. His findings are clear, defensible and impactful in both negotiations and legal proceedings.

Impartial, Data-Driven Resolutions

i2D applies a scientific and evidence-based approach to dispute resolution, delivering expert conclusions that go beyond surface-level observations. i2D's expert conclusions are grounded in thorough analysis, underpinned by engineering principles, field experience and project data. This impartial methodology ensure that our clients receive well-reasoned and objective support tailored to the unique circumstance of each dredging project.

i2D's expertise covers a wide range of technical and commercial dredging issues. Furthermore, we provide expert opinions in a variety of formats, including concise technical letters and comprehensive forensic investigations.

i2D also deliver detailed expert witness reports and provide oral testimony in legal proceedings where required. Our goal is to engage early, add measurable value, build lasting partnerships and help clients resolve disputes efficiently and constructively.

Our Approach

i2D's expert witness services are built on a unique blend of theoretical knowledge and real-world dredging experience. Simon and the team apply probabilistic methods, statistical reasoning and engineering principles to quantify uncertainties in dredging operations and to interpret site data meaningfully, thereby providing clear and justified conclusions regarding site data and its operational or environmental impacts.

Many of the disputes i2D address involve unforeseen latent conditions, often related to geotechnical or metocean factors that were incomplete or misinterpreted in initial investigations. Such conditions can lead to unrealistic production estimates, flawed budgets and schedule overruns, ultimately resulting in claims. i2D provides objective, data-driven insights that cut through ambiguity, helping to facilitate rational dispute resolution and effectively inform legal proceedings.

© Shutterstock, PreciousJ

Impartial dredging expertise, grounded in technical precision and data-driven analysis

Dredging Training Courses

At i2D we provide comprehensive dredging training courses aimed at equipping participants with vital skills and knowledge in the field of dredging.

Our courses are tailored to meet the specific needs of professionals looking to enhance their expertise.

Moreover, our team of instructors bring a wealth of knowledge and industry experience to i2D's training courses, ensuring participants gain valuable insights and practical skills that they can immediately apply to their projects.

i2D offers the following training courses.

Dredging and Reclamation

This course offers a deep dive into essential elements of dredging and reclamation works and encompasses the following content:

- Dredging and Hydraulic Fills

  Explores reclamation processes, dredger types, excavation techniques, as well as transportation and placement methodologies.

- Return Water Quality

  Provides information on designing reclamation areas, as well as return water quality management and control.

- Drilling and Blasting

  Delves into drilling and blasting activity cycles, blast design, explosives and mitigating risks inherent in drilling and blasting operations.

- Hydraulic Considerations of Dredging Works

  Discusses the development cycle of hydraulic fill projects, technical data acquisition and design of hydraulic fill masses.

- Physical Processes

  Covers the characteristics of rock, granular and cohesive materials, underwater excavation techniques and transport mechanisms.

- Dredger Monitoring and Control

  Explains how to define project baselines and monitor operational progress, engineering integrity and environmental compliance.

- Risk Mitigation and Cost Management

  Delves into project risk assessments and analyses, project risk registers and plans, as well as cost management risks.

- Management of Contracts and Adverse Physical Conditions

  Covers measuring and correcting performance, reducing contract delivery risks, contract lifecycles, financial analyses and dispute resolution strategies.

Pumps and Pipelines

The Pumps and Pipelines course provides an in-depth understanding of hydraulic transport systems.

The material covered includes:

- Pump engine types and characteristics.
- Pipeline characteristics, pressure losses, flow regimes and modelling.
- Soil like mixtures, including soil types, parameters and risks.
- Suction and discharge production.

i2D Dredging Software Tools

i2D provides training in the use of its tools, including the Rapid Plume Modelling, the Pumps 'n Pipeline and the Return Water Quality tools.

Enhance your skills and acquire accurate perspectives and expectations!

Featured Projects

i2D's core strength lies in its ability to operate effectively from both the contractor's and the client's perspective. With decades of combined experience in both contracting and consulting, our team draw on a strong foundation of academic knowledge and hands-on filed expertise to deliver dredging projects efficiently, reliably and cost-effectively.

Port Operators and Port Authorities

Client - BUSS Terminal Eemshaven B.V.

Soil Improvement Project at Julianahaven

Project Management

- Conducted a spud can punch-through analysis, which led to the recommendation of a solution involving soil improvement.
- Managed the soil investigation campaign and implemented quay side stability monitoring.
- Prepared and evaluated tender documents.
- Helped with the project's execution by managing the dredging contractor.

Client - Port of Melbourne

Yarra River Services Protection Dredging

Tendering Support

- Performed a tender package review.
- Reviewed feasibility of an alternative dredging methodology involving Water Injection Dredging.
- Assisted with contract type selection.
- Reviewed the selected contractor's work methodology and estimated production rates.
- Undertook a project risk assessment in collaboration with the contractor and the Port of Melbourne.

Mining Companies

Client - Energy Resources of Australia

Dredging Tailings at the Ranger Mine

Management of Dredging Operations

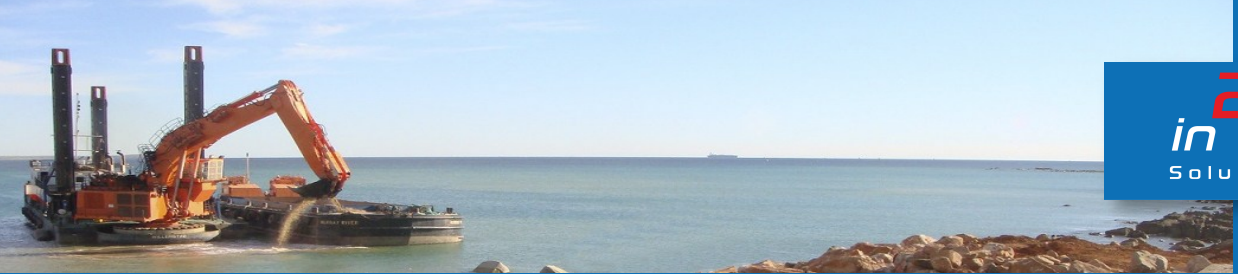
- Managed the contractor to maintain and operate two dredgers safely and efficiently.
- Monitored performance on a daily basis with the aid of the Equipment Performance Review tool so as to improve productivity.
- Commissioned and supervised operations of a new dredger.

Client - Roy Hill Holdings

Port Hedland Stanley Point Berth 3 Expansion

Dredging Works Tendering Support

- Provided technical support to the Roy Hill technical and procurement project team.
- Assisted with tender package preparation.
- Evaluated tender response packages, including conducting inspections of the tenderers' proposed equipment.
- Reviewed technical aspects of tender responses, especially proposed work methods.
- Undertook shadow estimates and provided technical evaluations of each submitted response.



Renewables Companies

Client - Hai Long Offshore Wind Power Co. Ltd

Hai Long Offshore Wind Project in Taiwan

Dredging Consultancy Services

- Prepared cable trench seabed preparation requirements.
- Conducted a suitability inspection of the Trailer Suction Hopper Dredger Nile River
- Developed scope of works and technical specifications for the dredging works
- Developed crossing design drawings.
- Conducted a risk and opportunity assessment for the cable trench dredging works.
- Designed the cable trench seabed preparation programme and produced shadow estimates for the works.
- Provided technical support as and when required.

Client - Copenhagen Offshore Partners

Offshore Windfarms Subsea Cable Burial

Consulting Services Provision for Cable Burial Works

- Prepared production estimates for the cable burial works using Trailer Suction Dredgers and Mass Flow Excavators.
- Conducted an analysis of an unforeseen soil conditions claim.

Contractors

Client - McConnell Dowell Constructors

Maintenance Dredging at the Osborne Naval Shipyard in South Australia

Provision of Specification Support Services

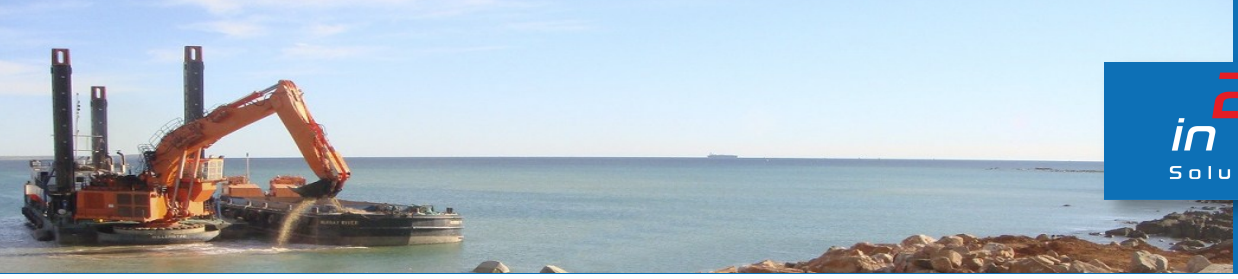
- Provided specifications for additional geotechnical investigations required for the dredging works.
- Delivered productivity estimates.
- Reviewed the contractor's maintenance dredging methodology.
- Undertook Return Water Quality modelling.

Client - Daewoo E&C Co. Ltd

Al Faw Grand Port Development Project in Iraq

Provision of Maintenance Dredging Support Services

- Undertook Placement Turbidity and Return Water Quality hydrodynamic modelling.
- Conducted a Threshold of Motion study for the soil to be placed in offshore dumping areas.
- Performed a feasibility assessment for offshore dumping in a shallower area.
- Created maintenance dredging manuals for the navigation channel and the port basin.



Government

Client - Australian Naval Infrastructure

Henderson Large Vessel Dry Berth Project

Conceptual Design Review

- Assessed and processed survey and geotechnical data.
- Identified potential environmental restrictions.
- Specified all additionally required field investigations.
- Detailed onshore and underwater disposal options.
- Assisted in the selection of dredger types and work methodologies, while assessing and outlining the implications of each option.
- Estimated volumes, productivity, cost and project duration.

Client - Rottnest Island Authority

South Thomson Bay Development Project at Rottnest Island

Dredging Consultancy Services

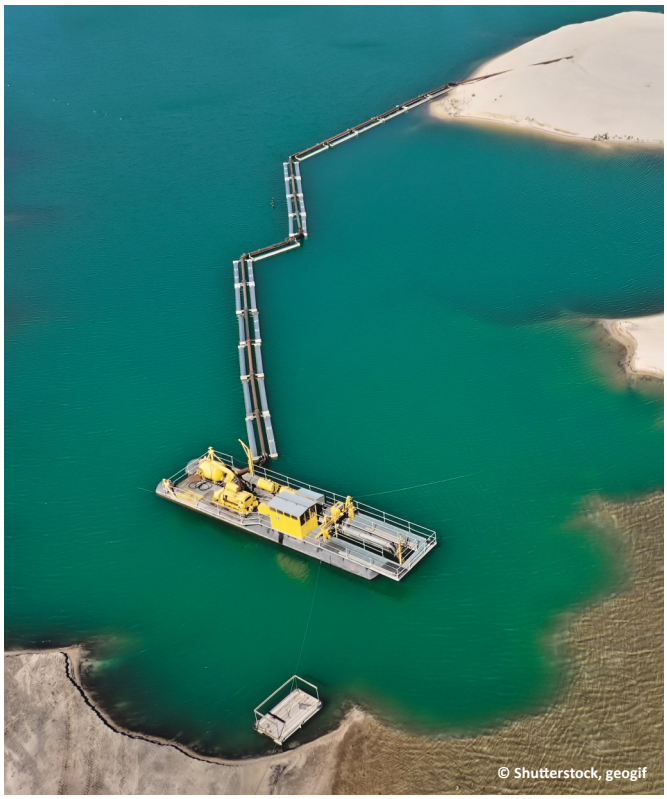
- Assessed the suitability of available geotechnical information from past site investigations.
- Prepared the scope of works and specifications required to acquire necessary geotechnical data on the rock layer present in the bay.

Client - Queensland Ports Association Inc

Long-Term Maintenance Dredging Programme

Maintenance Dredging Programme Management and Tender Support

- Defined and scoped the Long-Term Maintenance Dredging (LTMD) programme for Queensland ports represented by the Queensland Ports Association (QPA).
- Assessed service delivery options through a detailed analysis of dredging requirements and port-specific operational, environmental and regulatory needs across all QPA represented Queensland ports.
- Developed technical specifications to support the LTMD tender process.



Contact Us

We are here to help

If you would like to discover how we can assist you to successfully achieve your projects' goals, please don't hesitate to contact us.

Our Approach as Dredging Consultants

- Flexible and self-motivated approach.
- Global 24/7 support.
- Competitive rates.
- Clear and effective communication.
- Academic and field expertise enabling innovation.
- Confidentiality and integrity.

Dredging Support

- Projects are completed safely, cost-effectively and successfully.
- Contractors deliver operational improvements.
- Engineers address all requirements through suitable design.

Our Dredging Consultancy Services

- Programme and Project Management.
- Advanced Engineering and Reliable Estimating.
- Environmental Approvals, Studies and Plans.
- Insightful Geographic Data Processing.
- Cutting-edge Research, Development and Innovation.

Key Contacts

Simon Burgmans
Dredging Enquiries
Simon.Burgmans@in2Dredging.com
+61 (0)408 134 534

Sandra Gyles
General Enquiries and Administration
Sandra.Gyles@in2Dredging.com
+61 (0)406 862 741
+32 (0)484 101 447

Offices

i2D's business offices are located in Bayswater, Western Australia.