

ARCADIS & OTEK EIA Services



“Assisting your company develop its resources, with minimal impact to the environment”

OTEK is a member of the
ARCADIS Alliance Partner Program



Environmental Impact Assessment (EIA)

OTEK & ARCADIS

OTEK and ARCADIS share their capabilities and utilise their resources, skills and advanced knowledge of the Australian-specific laws and requirements to assist in quality and practical environmental solutions to the petroleum, oil & gas, mining, chemical, agricultural, communication, utility, defence, aviation, transport, marine and manufacturing industries.

OTEK and ARCADIS deliver timely professional results, provide superior expert services and project management in a diverse range of areas throughout Australia.

With more than 16,000 employees worldwide and \$2.4 billion in revenue, ARCADIS has an extensive international network and with the strategic advantages of having OTEK on-the-ground in Australia this support the demand for practical global expertise and utilising local resources.

OTEK and ARCADIS provide EIA and Environmental Impact Statement (EIS) services around the globe to help clients with approvals needed where regulatory legislation requires an assessment to be completed.

Our team provides these services to all industries, with leading consultants in each specific field, using project management processes that ensure either large or smaller EIAs are run smoothly with up-front planning.

We work with professional leaders to perform a range of EIA activities and assessments, to find solutions to meet your company's development needs, and combine professional services with well developed relationships with regulators in many jurisdictions. Where specific expertise is needed, OTEK is able to outsource to leading experts who are engaged through a quality selection process.

Some of our satisfied clients include:

- Rio Tinto
- BHP Billiton
- Exxon Mobil
- BP
- Shell
- Qatar Petroleum
- Reliance Industries Limited,
- Indago Petroleum
- Circle Oil/TGS-NOPEC
- Atlantis PGS Ltd
- BG
- Indago Petroleum
- GotOil
- Taqah Oil Exploration
- Sinopec / SIPC
- EnCana Occidental
- Total Fina
- Elf
- Petroleum Development Oman



EIA Experience

Most projects require an evaluation of a proposed project's potential environmental effects before project initiation.

An EIA is a planning tool often used to conduct an interdisciplinary analysis of the potential environmental, social, and economic effects of a proposed action, such as granting a specific permit for a project.

Developing an EIA helps decision makers systematically and comprehensively consider potential effects of the proposed action before they make a decision to endorse an action.

We have prepared hundreds of EIAs to satisfy a range of regulatory communities; these are commonly documented in environmental assessments, environmental impact statements, or environmental impact reports.

Consequently, we are well acquainted with current guidance and understand how it applies to and impacts resource management projects.

OTEK and ARCADIS have prepared EIAs related to oil and gas projects, pipelines, underground gas storage, roads,

mines, transmission lines, power generation projects, and communication projects.

Together we leverage our substantial EIA experience and understanding provide EIA services to help clients with approvals needed under the local environmental legislation and the federal Environment Protection and Biodiversity Conservation Act in Australia and development applications where other regulatory legislation requires an EIA to be completed.

We work with professional leaders to perform a range of EIA activities and assessments to help find solutions to meet your development needs.

Our team conducts field investigations for a wide variety of environmental resources.

Studies include baseline data collection, assessments to evaluate potential impacts and the implementation of monitoring plans to measure changing environmental conditions and the effectiveness of applied mitigation measures.

Water Resources	<ul style="list-style-type: none"> • Groundwater Well Installation/Monitoring • Water Quality Sampling/Analysis • Stream Gauging/Flow Measurement
Ecological Resources	<ul style="list-style-type: none"> • Threatened, Endangered & Special-Status Species Surveys • Wildlife Surveys • Fisheries/Aquatic Surveys • Wetlands Delineation and Vegetation Mapping
Air Resources	<ul style="list-style-type: none"> • Monitoring Station Establishment • Meteorological Monitoring • Air Quality and Emission Monitoring
Soils/Geological Resources	<ul style="list-style-type: none"> • Survey and Mapping • Profile/Log Descriptions • Sampling/Analysis
Cultural Resources	<ul style="list-style-type: none"> • Surveys and Testing/Monitoring
Land Use	<ul style="list-style-type: none"> • Land Use Mapping and Recreation Surveys
Visual Resources	<ul style="list-style-type: none"> • Key Observation Point Assessments and Visual Sensitivity Mapping
Noise	<ul style="list-style-type: none"> • Noise Monitoring and Vibration Studies

Our EIA Services



Some of our EIA Services include:

- Due Diligence Assessment
- EIA & EIS
- Regulatory Liaison
- Mine Closure and Rehabilitation
- General Petroleum Geology and Basin Analysis
- Petroleum Systems Analysis
- Thermochronology and Thermal History Modelling
- Reservoir and Source Rock Characterisation
- Oil and Gas Geochemistry
- Geophysics and Petrophysics
- Provenance Studies
- Reserves and Resources
- Basin Studies
- Mine Water and Groundwater Management and Treatment Technologies
- Ecological Assessment
- Groundwater Extraction and Treatment
- Marine Impact Assessments
- Social Impact Assessment and Community Liaison Plans
- Indigenous Impact and Archaeological Impact Assessment and Plans
- Sustainability Reporting
- Flora and Fauna Assessment
- Coal Drying Technology
- Noise Modelling
- Low Energy Water Treatment and Extraction of Organic and Inorganic Species
- Soil Assessments
- Geology / Geomorphology
- Hydrology as pertaining to surface waters
- Hydrogeology
- Climatology/Meteorology
- Reclamation/rehabilitation
- Air
- Wastes (sewage, spoil, overburden etc.)
- Physical factors, subsidence, stream alterations, wetlands, mangroves, Salinisation
- Ecology/ecological systems
- Land Use and Zoning
- Resource Use
- Infrastructure
- Heritage
- Aesthetics
- Hazards (radiation, electromagnetic, traffic)
- Ecologically sustainable development
- Biological factors including biodiversity, threatened species etc.

Regulator Liaison

OTEK and ARCADIS have regular liaison with environmental protection, mining and planning departments in each jurisdiction within Australia and in other parts of the globe.

In Australia, we have Auditor Qualification in the majority of states, where a very experienced senior consultant is granted authority to act as a technical decision maker/reviewer on behalf of the environmental government body, helping in approval of projects in a number of development areas.

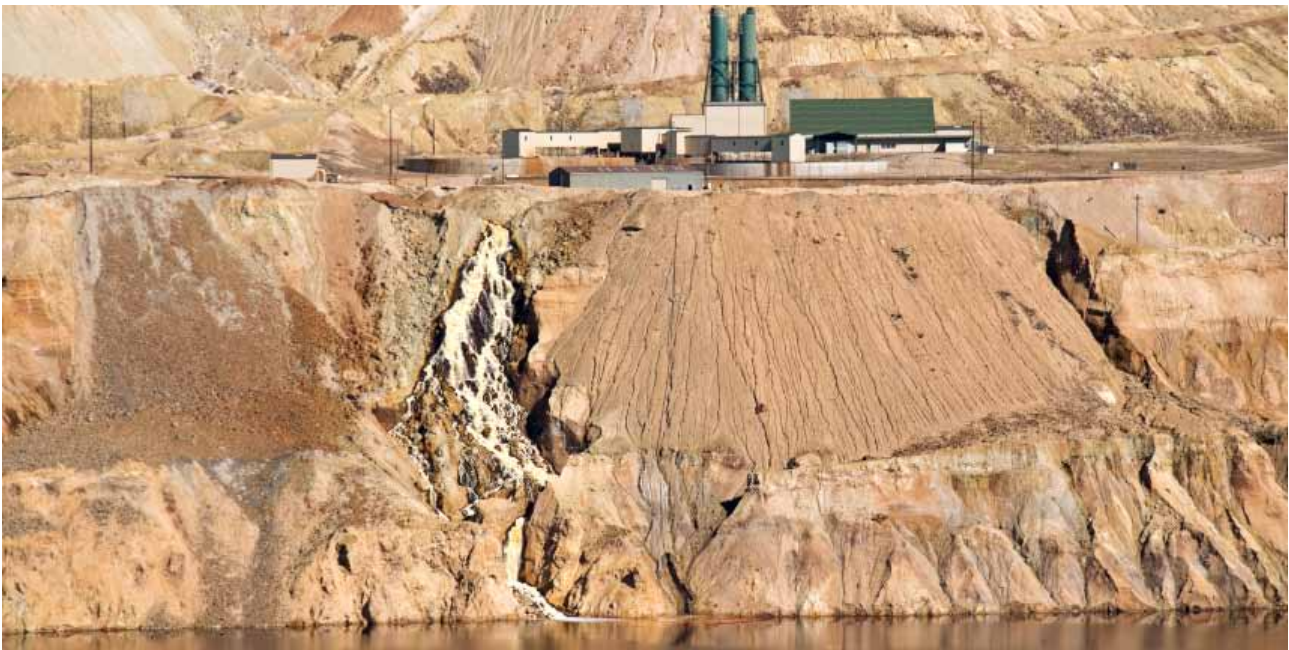


Hydrogeology

OTEK and ARCADIS provide hydrogeological consulting services to the mining, exploration and construction industries from the deepest mines, large open pits and remote projects all around the world.

Some of our key expertise includes:

- Mine Dewatering/Mine Water Control Programs (Underground and surface mines)
- Environmental Assessment and Remediation
- Closure and Post Closure
- Water Supply
- Baseline Studies
- Slope Dewatering/Slope Depressurisation
- Borehole Monitoring
- Hydrogeochemistry (instrument installation and programs)
- Pit lake chemistry
- Constant Discharge – Constant Head Tests
- Packer Tests – Wireline Packer Tests
- Tracer Tests
- Airlift Recovery Tests
- Modelling (FeFlow/Modflow)
- Waste Water Management



Water Treatment Technologies

Water management is essential to mining activities, and crucial to development approvals, operation and production, and mine closure. It is vital that a consultant is used in EIA's that can ensure your plans and development adheres to relevant policies and practices in each jurisdiction, and satisfying regulators that water is well managed.

We offer an integrated approach to mine water management, combining specialist expertise in hydrology, hydraulics and hydrogeology with geotechnical, environmental and mining skills.

Experience in mine water assessment, management and treatment, including:

- Baseline studies
- Hydrologic studies linked to flood prediction
- Integrated environmental planning
- Water balance modelling

- Waste characterisation and management
- Water supply and mine dewatering
- Water management plans
- Seepage control and contamination assessment
- Quantitative contaminant modelling
- ARD, water quality and geochemistry
- Diversion (or catchment) structures and spillways
- Engineering design and procurement
- Contract management and QA/QC
- Coal de-watering technologies
- Pit dewatering and treatment
- Sludge treatment
- Groundwater modelling, and extraction and treatment
- Innovative water treatment technologies



Creative Water Technology Ltd



Our team is experienced in proven technologies and creative in developing new solutions, ensuring cost effectiveness and simplicity in design and serviceability and focused on providing timely and high quality products and services in accordance with our Quality Management System and Certification to ISO 9001.

We provide extensive hydrocarbon extraction and remediation experience, and heavy metals remediation technology, utilising a combination of extraction units and technology built, owned and operated by Creative Water Technology Ltd (CWT).

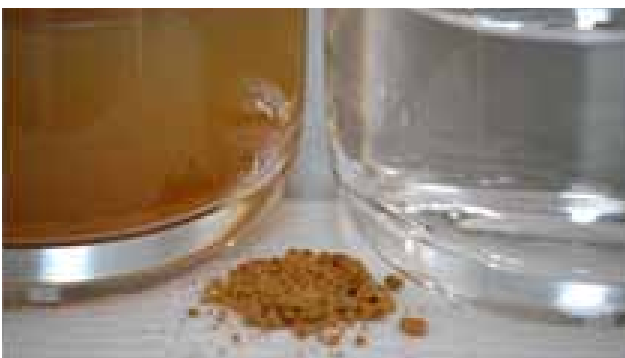
Most existing technologies operate with high energy distillation, filters or biological processing. CWT's technology

uses a low temperature, thermal distillation process known as adiabatic recovery to desalinate, dewater and/or recycle highly saline and highly contaminated wastewater.

The technology has been specifically designed to handle the high levels of contaminant that alternative technologies struggle to process, with proven results for water samples with TDS levels over 300,000ppm that were reduced to less than 20ppm. Comparatively, reverse osmosis struggles to process contaminant levels over 70,000ppm effectively, and has been effective in Coal Seam Gas treatments, and heavy metals removal. The application is robust and can separate a range of organic and inorganic compounds.

CWT technology is able to reclaim up to 97% clean usable water and up to 100% of the contaminants contained in the feed water. Soluble and insoluble contaminants are separately extracted and dried for sale or re-use.

The compact nature of the Creative Water Technology allows it to be located on a clean site or as a retrofit to existing water processing plants to treat their waste or brine discharge.



EIA Case Histories



EIA at a Former Gasworks

We performed an EIA at a former Gasworks prior to proposed remediation in preparation for redevelopment of the site. Previous investigations had indicated widespread PAH, heavy metals and cyanide contamination in soil and groundwater. The purpose of the EIA was to provide additional site data on which to base a site remediation plan. The investigation involved review of the results of several previous investigation and monitoring reports; identification of data gaps; preparation of a sampling and analysis plan targeting data gaps, potential sources of impact and potential COCs; and a soil boring program. Based on the results of the EIA, we prepared a report detailing and comparing remediation options such as thermal desorption and a lined landfill for disposal considering logistical, environmental, risk and costs.



Australian University - EIA

The client is one of Australia's most successful tertiary institutions. We were engaged in 2009 to conduct an EIA of specified sites, which involved: the identification of sources of environmental risk, including those risks that have the potential to have a significant impact on the environment; determination of the exposure of environmental risk (level of inherent and residual environmental risk) and the adequacy of control measures; noting the existing rationale, management practices, procedures and activities that contribute to Environmental Management at the university; conduct of an environmental legal compliance assessment to evaluate the client's compliance with environmental legal obligations and other pertinent requirements to which the client subscribes; ascertaining the client's current environmental performance and compliance with the International ISO 14001 Standard to facilitate the development of an EMS; identification and recommendation of measures for improvement; and a written report and verbal presentations of findings.



Community Consultation

Our staff recently travelled to Port Hedland and conducted a number of site inspections and public interviews with interested parties (including Aboriginal representatives and Council Planners) to ascertain the most appropriate location for the construction of large communication platforms. We were able to assist our client identify an alternative site for the platforms and then realise a significant cost saving in annual lease fees for the alternative site.



EIA for Development of Exploratory Oil and Gas Wells

We prepared an EIA that evaluates the development of three exploratory oil and gas wells on National Forest System (NFS) lands. The proposed wells would evaluate production potential and if these wells proved productive, a Master Development Plan would be implemented with the addition of 16 well pads. In support of this EIA, we performed a baseline survey for sensitive and management indicator species (MIS) of amphibians in June of 2010. The objective of the amphibian survey was to confirm whether breeding populations of sensitive or MIS amphibians occur within the project area. This amphibian survey confirmed that breeding populations of two USFS MIS amphibians are present within the project area, and that project activities affecting riparian areas or ephemeral ponds have the potential to affect these amphibians.

EIA Case Histories



EIA of a Lake Recreation Area

We managed a long-range planning effort and associated EIA for a lake recreation area, which is an extremely popular recreation resource. We conducted a Roads Analysis that involved a detailed field survey and characterisation of social and designated roads and trails. More than 150 road and trail segments were surveyed, inventoried for environmental features, and analysed for potential future uses. Because of the intense public scrutiny, facilitating a proactive and interactive dialogue with the interested public was a key component of successful project implementation. We delicately handled the public's concern and created a realm for effective stakeholder engagement. This project required intensive field data collection in very remote areas. Extensive logistical staffing plans and schedules were developed. We developed a process where field data could be easily captured and uploaded into GIS to perform the roads analysis and complete the EIA.



Facility Expansion - EIA and permitting

The client planned to expand its core business of storage and shipment of class 3 and 4 liquids for 3 sites. In support of the planned development, we implemented the EIA process, permit applications under the Environmental Management Act and Pollution of Surface Waters Act, performed a QRA analyses, and developed other relevant permit applications for the proposed expansion. The EIA and permit application prepared by us offered the client flexibility in their future operations, with assessments for a range of storage materials. Project challenges included collecting a sufficient quantity and level of survey information for safety, ecology, noise and air, despite an early stage of (pre-) engineering. We liaised successfully with relevant authorities and engineers to deliver a suitably flexible end result.



EIA and Permitting For Two Gas-fired Power Plants

A new Combined Cycle Gas Turbine (CCGT) of approximately 500 MW will replace an existing gas-fired plant. In addition, our client intends to build a similar CCGT in another area which will provide heating and electricity. We were retained to prepare the EIAs and various permit applications for both projects. The challenge of these types of projects resided in presenting technical information to the public in a simple, non patronising manner, thereby helping to speed up the decision-making process. The information presented by us included the objectives of both projects and the choices that formed their basis. We also clarified the environmental impact by means of air, noise and ecological studies, and organised the application process for three permits: an environmental permit, a permit under the Pollution of Surface Waters Act, and a Nature Conservation permit.



EIA for a Gas Transport Service

Our client is installing a 48" natural gas pipeline. This expansion of the gas transport network is necessary to meet the need for gas in the region. The pipeline is more than 400 kilometers long, crosses 9 provinces, more than 50 municipalities and 10 water boards. For that reason the trace was divided into 9 sections, each requiring its own EIA. We formulated an initial memorandum and an EIA for each trace section. We also provided communications regarding the EIA reporting. Each EIA was approved by the regulatory authority and construction of the pipeline started in 2008. Complete construction is expected to be completed in 2012.

EIA Case Histories



Permitting for new Biocentre

Our client was challenged with obtaining a permit, then creating and operating a “biocentre” site, where hydrocarbon-contaminated soil would be treated. The treatment capacity was 20,000 tonnes per year, and the facility would handle waste from 11 locations. In support of this project, we performed a regulatory study, comprising 5 documents: a letter, a project presentation, an EIA, an Industrial Risk study and a Health and Safety study. Upon submission of all documents, the local administration accepted the studies and provided a permit for a site of 2 hectares located in an unused quarry, in accordance with federal regulation and the air/waste/water control regulations.



Project Highlight: EIA for Biomass Plant

The client intends to develop, install, commission and operate a green power plant using renewable fuel (biomass) capable of supplying electricity to 50,000 homes. The plant will generate 50MW and will employ the best available technology to comply with the requirements of its IPPC (Integrated Pollution, Prevention and Control) authorisation and will be extremely efficient. In support of this groundbreaking project, we provided a combined engineering and EIAs from inception to completion. The Planning Application received full consent in January 2009. Pre-construction site works including erection of an acoustic barrier fence and the relocation of plants and insects to a nature reserve area began in 2010.



Production site EIA

Regulatory changes required the existing EIA associated with all installations at this location, a chemical and pharmaceutical production site, to be reviewed, updated and documented by a neutral expert. We deployed a systematic and complete evaluation of environmental impacts from the facility. This documentation formed the basis for the simplification of future approval procedures and was facilitated by active dialogue between the client, its neighbors and the public.



EIA, permitting and safety studies for underground gas storage project

The oil and gas client is extending a large underground gas storage (UGS) near the municipality of a large major city. Therefore the gas field and the UGS must be connected by a new 48” gas pipeline. An EIA is required because of the size of the project and the impact of the pipeline on the very sensitive environment. We were responsible for the EIA, the permitting, communication with stakeholders and the safety studies for the tie-in at the gas field. The project started in 2009 and was completed in 2010.



EIA for Natural Gas Pipeline

We prepared an EIA that evaluated the effects of a 50-mile long pipeline project designed to supply natural gas to a major city. The proposed route follows an existing highway through a steep, narrow canyon just outside a wilderness area. Key issues include: effects on the city river and existing highway, river crossings, slope stability, soils and hydrology, wildlife habitats, scenic byway, scenic integrity and visual impacts, and conflicts with recreation use and traffic.

OTEK Global Headquarters

National

OTEK, Level 1
222 St Kilda Road
St Kilda, VIC 3182
Australia
T: +61 3 9525 5155

OTEK Principal Offices:

Sydney

OTEK, Level 4
384 Eastern Valley Way
Roseville NSW 2069
Australia
T: +61 2 9417 4499

Brisbane

OTEK, Level 1
9/44 Station Road
Yeerongpilly QLD 4105
Australia
T: +61 7 3426 5200

Melbourne

OTEK, Level 1
222 St Kilda Road
St Kilda, VIC 3182
Australia
T: +61 3 9525 5155

Perth

OTEK, Level 1
79 Hay Street
Subiaco WA 6008
Australia
T: +61 8 9381 5500

Adelaide

OTEK, Level 5 City Central
121 King William Street
Adelaide SA 5000
Australia
T: +61 8 8423 4480

Beijing

OTEK北京市海淀区蓝靛厂南路25号牛
顿办公区706室100097
Suite 706 Newton Office Building
25 Lan Dian Chang South Road
Haidian District, Beijing 100097
China
T +86 10 8840 0302

ARCADIS Global Headquarters

ARCADIS NV

'Symphony'
Gustav Mahlerplein 97-103
1082 MS Amsterdam
The Netherlands
T +31 20 2011080

ARCADIS Principal Offices:

Belgium

ARCADIS Belgium
Posthofbrug 12 (City Link)
2600 Berchem – Antwerpen
Belgium
T +32 3 3286286

Brazil

ARCADIS Logos Ltda.
Rua Libero Badaró, 377-11º andar
CEP 01009-906, São Paulo
Brazil
T +55 11 3117 3171

Chile

ARCADIS Geotécnica S.A.
Av. Eliodoro Yañez 1893
Providencia, Santiago
Chile
T +56 2 3816000

China

ARCADIS Asia
Zhongrong Plaza, Unit 1203
1088 South Pu Dong Road,
Pudong New Area
Shanghai, 200122
China
T +86 - 21 587 61 451

Czech Republic

ARCADIS CZ a.s.
Na Strži 1702/65
140 62 Prague 4
Czech Republic
T +42 296 330111

France

ARCADIS ESG
9 Avenue Réaumur
92354 Le Plessis-Robinson Cedex
France
T +33 1 46 01 24 00

Germany

ARCADIS Deutschland GmbH
Europaplatz 3
64293 Darmstadt
Germany
T +49 6151 3880

Italy

ARCADIS SET s.r.l.
Via Piemonte 32
20090 Buccinasco (MI)
Italy
T +39 02 48841600

The Netherlands

ARCADIS Nederland BV
Piet Mondriaanlaan 26
P.O. Box 220
3800 GV Amersfoort
The Netherlands
T +31 33 4771000

Poland

ARCADIS Polska Sp.zo.o.
Ul. Pulawska 182
02-670 Warszawa
Poland
T +48 22 203 2000

Romania

ARCADIS Eurométudes
Strada Gheorge Manu, nr. 20,
Sectorul 1
71106 Bucharest
Romania
T +40 21 31 22699

Russia

ARCADIS Rus OOO
111524 Moscow
Elektrodnaia Str. 13, building 16
Russia
T +7 9262416032

United Kingdom

ARCADIS UK Ltd.
10 Furnival Street
London EC4A 1YH
United Kingdom
T +44 207 2161000

United States

ARCADIS US Inc.
630 Plaza Drive, Suite 200
Highland Ranch
Colorado 80129-2379
United States
T +1 720 3443500

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This Alliance is an association of cooperating independent companies established to network services world-wide for the benefit of its Clients and no legal association is expressed, except through written agreements with such Clients.