

## Company Declaration

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Company name: WaterSolutions Pty Ltd  
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Australia  
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Email: [watersolutions@ws.com.au](mailto:watersolutions@ws.com.au)

### Declaration Statement:

We hereby declare that all team members have read the content of the document in full and understood all policies and statements.

This tender will also act as reassurance that all works conducted by the team members within the contracted period will comply with all client and company legislature.

We solemnly declare that the content of this document is true and correct to the best of all team members' knowledge. Any willful violation of the aforementioned statements are subject to punishment by law.

Name:	Hamilton, Fergus William	Sign:
		Date:
Name:	Almasoud, Bader	Sign:
		Date:
Name:	Argent, David Benjamin	Sign:
		Date:
Name:	Nguyen, Tri Ly	Sign:
		Date:
Name:	Wickramaratne, Kasadoruge Trinita Anne Nimali	Sign:
		Date:
Name:	Li, Jianan	Sign:
		Date:
Name:	Magor, Joshua Luke	Sign:
		Date:

11th March 2015  
Tonkin Consulting  
2/66 Rundle Street  
KENT TOWN SA 5067

Dear Faisal,

**RE: Call for tender: North Terrace Drainage Design**

WaterSolutions would like to formally register its interest in performing the feasibility study for the enhancement of the stormwater drainage systems of North Terrace, Kent Town issued by Tonkin Consulting.

With a workforce of over 30 highly skilled and passionate engineers, WaterSolutions has become a well-established company with many years spent working in the water engineering consultancy industry. We also specialise in a number of other different engineering disciplines including:

- Project Management
- Geotechnical Engineering
- Environmental Management
- Road Engineering & Traffic Management
- Urban Planning and Development

The following expression of interest contains company information, our services and the complete design proposed for the feasibility study for the project. At WaterSolutions we pride ourselves on the high quality and delivery of our work and can guarantee that the completion of the feasibility study will be done on time and to budget.

WaterSolutions values the feasibility study of the enhancement of the stormwater drainage systems of North Terrace, Kent Town at:

**\$297,368.00**

WaterSolutions looks forward to hearing about the result of our application and thank you for your thoughtful consideration, we hope that you look on our application favourably. Feel free to contact us any time if you have any questions or concerns.

Yours Sincerely,

Fergus Hamilton  
Project Manager

WaterSolutions Pty Ltd  
ABN: 93 056 894 5459

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## **1.0 Company Profile**

### **1.1 Company History**

Established in 2015, WaterSolutions Pty Ltd is a water resource management focused, multicultural engineering consultancy firm which comprises of 30 excellent engineers and technical staff who always strive for excellence and continual improvement. While young, the company personnel are all experts in their fields and have vast experience working in water related projects.

Our company strives to meet all clients' expectations through our high standards of work, established levels of trust and exceptional communication. Together, we aim to achieve the highest standard of work with a minimal, competitive cost.

### **1.2 Company Objectives**

We see ourselves as a trusted solver for all stormwater and sewerage system related problems through cost effective, innovative and ethical solutions. We put our clients' mind at ease, as we strive to provide sustainable, environmentally friendly solutions throughout our work and at various stages of the project.

Here at WaterSolutions, we place team work as our highest priority. Our engineers excel to work well together as a team and with our clients to produce the best possible outcomes.

Our company places great emphasis on using the latest technology to enable technical growth. We utilize only the most advanced, cutting edge tools in our design and problem solving to ensure high quality service to our clients.

Our WHS policies guarantees a safe and ethical working environment to all our employees, to improve work efficiency and to provide a sense of belonging to our company.

## 1.3 Company services

Our services include but are not limited to:

### **Geotechnical Engineering**

- Soil classification and site investigations
- Retaining wall design
- Dam design
- Slab and pavement design
- Foundation design

### **Water Engineering**

- Storm water and Sewerage systems design
- Water supply design
- Flood mitigation
- Water Sensitive Urban Design

### **Transport Engineering & Traffic Management**

- Road design
- Implementation of traffic management

### **Environmental Management**

- Environmental Risk Management
- Environmental Impact Assessment
- Noise and dust control
- Water quality assessment

### **Urban Planning & Development**

- Urban design and development
- Community engagement & consultation

### **Project Management**

- Project Risk Management policies
- Experienced in Project Management processes

## **2.0 Financial Backing**

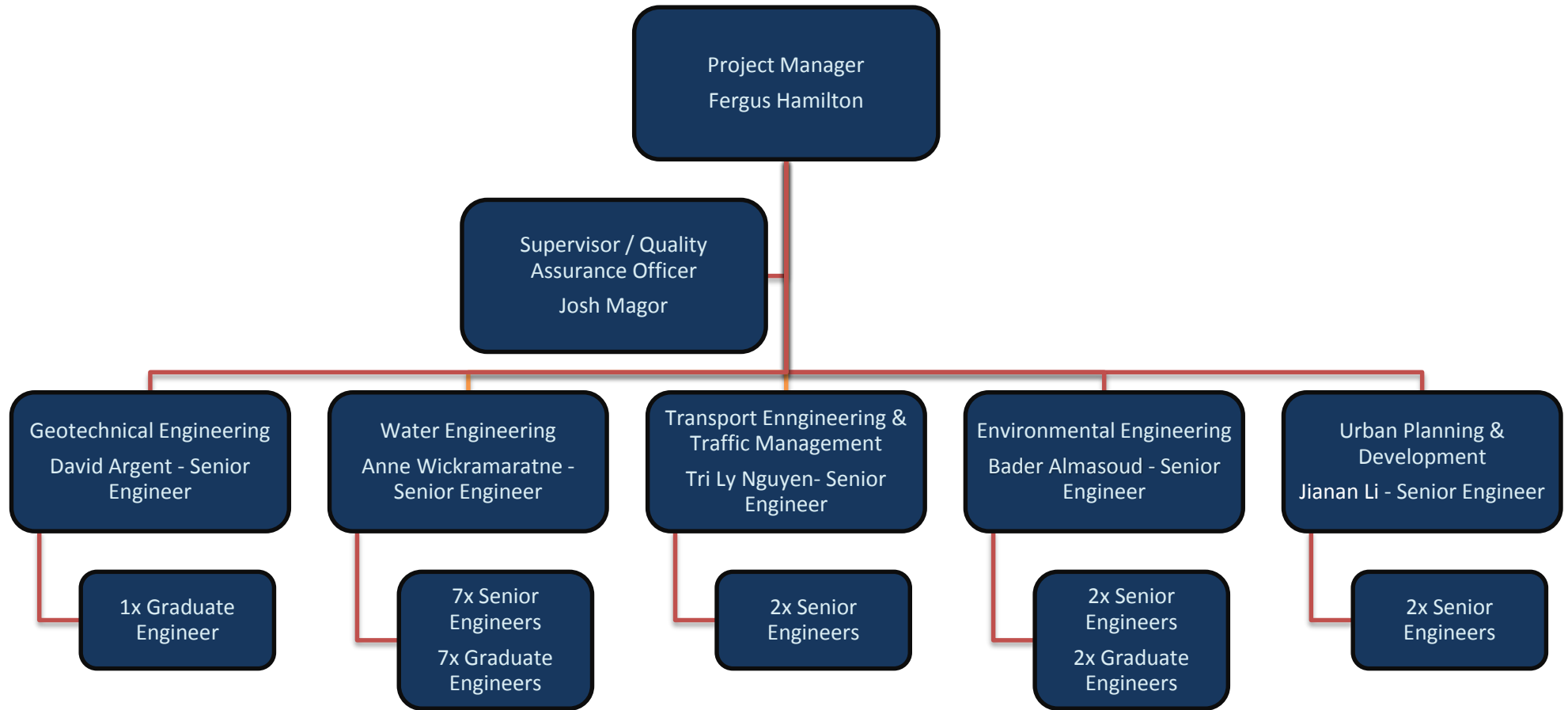
WaterSolutions Pty Ltd is a private company which is backed by our loyal stakeholders such as BankSA and Western Pacific Financial Group who invest in our company. Our quality and schedule of work are thus always guaranteed.

We have public liability (\$20,000,000) and professional indemnity (\$5,000,000) insurance and we are able to provide evidence of our WorkCover registration if required.

## **3.0 Management Structure**

WaterSolutions consists of 30 highly skilled engineers along with a number of other technical staff that make up the workforce of the company. The management structure consists of five main departments, these include Geotechnical Engineering, Water Engineering, Transport Engineering & Traffic Management, Environmental Engineering and Urban Planning and Development. The Senior Engineers of each department look over the works and make sure their team is working in accordance to the company's policies and project schedule and are meeting the client's requirements. They are responsible for the coordination of the tasks that are being performed in their specific group. The departments are made up of a mixture of senior and graduate engineers, with the number of engineers in each department being dependent on the amount of work that needs to be done. A breakdown of the company's hierarchy can be seen in section 3.1.

### 3.1 Company Hierarchy





## 3.2 Key Personnel

### *Project Manager*

Fergus Hamilton

Fergus Hamilton is the project manager of WaterSolutions, he is passionate about what he does and strives to maintain good relationships with his clients and colleagues. He builds a sense of belonging among employees which leads to higher employee morale. He has valuable experience in the industry with over 4 years working as a civil draftsman, working on various mining projects in WA and being involved in many UniSA design projects.



### *Supervisor/Quality Assurance Officer*

Josh Magor

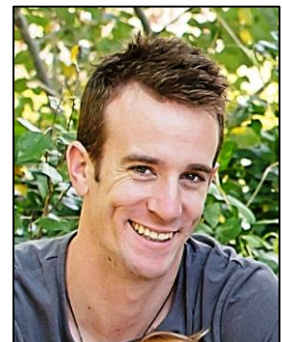
As a supervisor and quality assurance officer at WaterSolutions, Josh has a high level of knowledge and expertise in this area. Josh can provide clear-defined project paths, he is energetic and efficient and can manage technical processes. He has experience with managing many projects, such as the Barossa Water Treatment Plant Chemical Safety Upgrade and the Regional Pipeline Survey.



### *Senior Geotechnical Engineer*

David Argent

David Argent is an experienced Geotechnical engineer and is skilled at finding innovative solutions to difficult problems. David has been involved with many geotechnical projects such as: Directional Drilling Assessment, Mt Torrens and Birdwood, Pavement Rehabilitation Investigation and Soil Waste Classification for Clement Dr, Elijah St, Malone St, Morphett Vale and Bellaview Rd, Flagstaff Hill, Rising Sewer Main Upgrade, Geotechnical Investigation, Hahndorf.



### *Senior Water Engineer*

Anne WICKRAMARATNE

Anne is a Senior Water Engineer and is enthusiastic about water sustainability, providing cost effective solutions and using environmentally friendly, sustainable technologies for effective flood management and effective flood mitigation. Anne has 12 weeks work experience with the City of Port Adelaide and has been involved in many projects including the investigation and survey for the stormwater system upgrade in Law Hill Ct, Taperoo and investigation of detention basins and aquifer storage and recovery systems in Lightsview land development.



### *Senior Transport Engineer & Traffic Manager*

Tri Ly Nguyen

Nguyen is a Senior Transportation Engineer at WaterSolutions. Transportation engineering is the science of safe and efficient movement of people and goods and Nguyen is experienced in delivering safe and cost effective solutions in this field. He has gained vast experience by being involved with Engineers Without Borders 2012 (Vietnam) and through working on projects such as the Yalata Road Drainage Project.



### *Senior Environmental Engineer*

Bader Almasoud

Bader is the Senior Environmental Engineer and provides environmental design solutions to help improve water and air sources, provide safe drinking water and control pollution of water supplies. Bader is experienced in this area and is passionate about supplying innovative and cost effective solutions to these problems. Throughout his degree he has developed strong communication, presentation and problem solving skills.



## *Urban Planning & Development Manager*

JIANAN LI

JIANAN LI is the Urban Planning & Development Manager and delivers a high level of environmental sustainability in the development stage of projects and leads her team to provide the best solutions for the social, economic, physical and ethical environments. Developing solutions for the affected communities requires thorough research and understanding as well as an appreciation of the needs of the community, JIANAN LI is experienced in finding solutions to these problems.



## 4.0 Statements of Policy

### 4.1 Occupational Health & Safety Policy (OHS&W)

WaterSolutions prides itself on its world class occupational health and safety policy that is dedicated on protecting everyone involved in a project from its inception to the final delivery. WaterSolutions adheres to a strict OHS&W policy in which all personal must meet all standards and regulations. To ensure that all these policies are met, WaterSolutions has an extensive auditing system to monitor and ensure that a high level of safety is met through all phases of a project. The auditing system covers all aspects of the workplace to ensure that safeguards are met, all personal are adhering to the policy and that the policy is understood by all members of the workforce. The main objective of the occupational health and safety policy is to create a workplace that has zero workplace incidents and injuries. This is achieved by taking a practical but calculated approach to improving work and safety conditions through careful planning, management and compliance of industry standards.

WaterSolutions occupational health and safety policy is committed to:

- Complying with all industry laws, regulations and standards
- Enforcing risk management systems to protect all persons in the workforce
- Providing an appropriate induction program for all employees to provide them with adequate training in regards to health and safety requirements
- Addressing any workplace incidents and acting appropriately to ensure that the risk of further incidents can be reduced or eliminated
- Continual review of the company's OHS&W policy to ensure it is up to date and constantly being improved
- Ensuring that all managers, workers, contractors are aware of their personal requirements to maintain safety in the workplace

WaterSolutions understands that the health and wellbeing of its workforce is integral in maintaining the success of the company into the future and therefore take great pride in our occupational health and safety policy.

## 4.2 Quality Assurance Policy

At WaterSolutions we aim to not only meet the expectations of our clients but to exceed them. To ensure this, we have a quality assurance policy in place that makes sure for every project we are involved in the outcome is of world class and of the highest quality. WaterSolutions prides itself on being at the forefront of quality assurance with specific quality management plans produced for each project. The quality assurance policy acts as the framework that ensures that all employees and contractors are aware of and prepared to meet the quality requirements.

WaterSolutions quality assurance policy is committed to:

- Understanding the client's needs, interest and expectations
- Ensure that all resources are effectively used and are well managed
- Provide the workforce with the adequate resources, training and guidelines to ensure that the tasks they perform are of the required level of quality
- A well planned project delivery schedule to ensure that the project budget is met and the project is finished on time
- Continually monitor the quality of the work throughout the project, at the end of the project and in the future after the project has been completed
- Continual monitoring of the policy with the aim of improving overall performance

### 4.3 Environmental Policy

In all consulting projects that WaterSolutions deals with, a strong emphasis is always placed on protecting the surrounding environment. WaterSolutions is committed to implementing an environmental policy that spans over the entire project, from design, construction and maintenance to ensure that the environment is protected from start to finish. The environmental policy is in place to ensure that any negative effects on the environment of our projects are kept to an absolute minimum.

WaterSolutions environmental policy is committed to:

- Ensuring that all works comply with the relevant environmental regulations, laws and standards
- To deliver the best possible solutions and outcomes to the client whilst keeping environmental impact minimal
- Actively using sustainable building supplies and sustainable design plans
- Ensure that all staff are familiar with the company's environmental policy and the relevant regulations and standards
- Consideration of the environment at all stages of the project

## 4.4 Key Stakeholders Policy

WaterSolutions is committed in having the concerns and ideas of all stakeholders a key priority. During all parts of the project WaterSolutions strive to communicate regularly with stakeholders and other key interest groups to make sure they are well informed.

WaterSolutions key stakeholders policy is committed to:

- Communicate regularly with stakeholders to keep them well informed on the current stage of the project
- Address and take into account stakeholders ideas and concerns throughout the project
- Ensure that all communication between the company and stakeholders is done in a professional manner
- Conduct open meetings where key issues, associated risks and other issues can be highlighted and discussed with stakeholders

The following key stakeholders have been identified and will be consulted during the feasibility study and through the design and construction stages:

- Department of Planning, Transportation, and Infrastructure (DPTI)
- City of Norwood, Payneham & St Peters
- Adelaide and Mt. Lofty Ranges Natural Resource Management Board
- Landholders
- Adelaide Metro
- Local Businesses
  - Hickinbotham Group
  - Royal Hotel
  - Clark Rubber
  - Adelaide Heart Clinic
  - North Terrace Tyres
  - St Peters College – Junior School
- Utility services
  - Agile Communications
  - Amcom Pty Ltd – SABRENet
  - Amcom Pty Ltd (Adelaide)
  - APA Group, SA
  - Nextgen, NCC – SA
  - Optus and/or Uecomm, SA
  - SA Power Networks
  - SA Water
  - StateNet Services
  - Telstra SANT

## **5.0. Specific Project Teams.**

### **5.1. Engineering and Design Specifications Team.**

The engineering and design specification teams will be responsible for carrying out both the preliminary and detailed design for the drainage mitigation options that will be considered in the feasibility study. The design engineers will collaborate with the QA site engineer on a daily basis through the course of the construction to make sure that all project's tasks are executed according to the project specifications and requirements.

### **5.2. Quality Assurance/Quality Control Team.**

A Quality Management Plan (QMP) will be defined for this project in order to reduce the risk of project failure due to inadequate project management process. The QMP will define the project management processes that will be applied to ensure that the project is managed in accordance with project methodologies and standards. The QA / QC team will be responsible for ensuring and verifying the compliance of all deliveries with the project specifications used in all construction stages. The basis of the quality plan is based on the Australian Standards. The quality control measures will extend to field sampling procedures; types of material and equipment to be used; and methods of performing, documenting, and enforcing quality control operations of both the contractor and subcontractors.

The maintenance of QMP will be the responsibility of the Quality Control Manager (QCM). The QCM will be responsible for ensuring that all materials and work comply with the contract specifications. The QCM will have a field engineer at his disposal to assist him with the on-site inspections. Testing firms will be at the disposal of the quality manager to ensure contract compliance in all aspects of work. All reports from testing companies will be forwarded to the QCM for his review and approval.

### **5.3. Field Site Management Team.**

The field site management team will be responsible to supervise the work that is undertaken on site on a daily basis. The management team will review all the daily reports that are prepared by the site engineer and will be responsible in making sure that all tasks are carried out according to the project specifications and standards. The team will also be responsible to ensuring that the Health and Safety measures are strictly applied.



## **6.0. Construction Procedure and Parameters.**

### **6.1. Field Inspection QA/QC.**

QA and QC field inspection will be carried out to:

- Verify that all equipment and materials delivered into the site comply with the project specifications and standards;
- Inspect all geotechnical works such as earthworks, soil compaction and site investigation;
- Inspect all the structural elements such as culvert and drainage pipes that will be installed;
- Monitor any field testing such as soil testing, concrete testing, environmental testing that may be required during the project.

### **6.2. Roadways and Civil Work.**

Roadways and Civil Works will involve:

- Verification of survey work;
- Verification of earthworks and field testing;
- Verification of quality of materials used for road construction;
- Verification of soil compaction.

### **6.3. Concrete/Structural.**

This will involve:

- Verification and inspection of precast drainage elements delivered into the site;
- Monitoring and witnessing both lab and in-situ concrete testing;
- Inspection of the insulation of the new installed drainage system including underground pipes and/or culverts;
- Witnessing loading testing on structural element of the new drainage system;

## 6.4. Electrical Collection System.

This will involve:

- Inspection of electrical cables and any underground network prior to any earthwork (excavation or backfilling);
- Verification of safety procedure related to earthworks in areas with underground services;

## 6.5. Health and Safety Plan.

Health and Safety Plan will be developed to cover all the different areas involved in the project. The nature of each plan will depend on the project activity. The H&S plans will be established to ensure safe work practice during the following:

- Excavation works;
- working from heights (such as EWP, crane, scaffold);
- Dealing with contaminated substances and water;
- Geotechnical drilling (boreholes, piles);
- Lifting objects by crane (lifting concrete pipes, culverts, etc);
- working near electricity lines.

## 6.6 Environmental Protection

An environmental management plan will be established for this project in order to assess the impact of the construction activities on the environment. The Project Environmental Supervisor will be responsible to monitor the daily construction activities on site and report to the Project Manager on a weekly basis on any environmental issues. In case of any environmental issue, the Environmental Manager will ask the site supervisor to develop the necessary corrective measures.

The environmental protection plan will take into account the following potential impacts:

- generated noise during construction;
- Dust during soil excavation;
- Smoke and gas exhausted from the different plants on site;
- Contaminated material

## 7.0 Feasibility Study Components

The following sections contain a list of factors and considerations that WaterSolutions Pty Ltd believes will be of importance in undertaking a feasibility study for the enhancement of the stormwater drainage systems of North Terrace, Kent Town.

Our consultants will identify and review all background reports relevant to the study area and will provide costing information for all identified design options.

### 7.1 Water Engineering

WaterSolutions is one of the leading companies in the Industry who provide innovative and efficient solutions mainly for Stormwater related projects. Our experts have experience and knowledge in providing cost effective, environmental friendly and sustainable technologies to manage stormwater quantity and quality for effective flood mitigation.

Through our base investigation, our experts have identified the following key components which have to be investigated in relation to this project:

- Assessment of the existing stormwater system and the functionality and deficiencies of stormwater infrastructures;
- Capacity of the current stormwater infrastructures in relation to rainfall run off;
- Rainfall data and the change of rain fall patterns in recent years;
- The rapid reduction in green fields (pervious) areas due to urban development;
- Trapped low points in the area without proper, controlled overflow plans;
- Capacity and functionality of the creek both in public owned and private owned sections;
- Life cycle of the stormwater system, maintenance and service level, and;
- Quality of discharging water into First creek through the drainage system.

According to the Stormwater Infrastructure and Asset Management Plan of City of Norwood, Payneham and St. Peters and a preliminary site visit, the existing drainage plan in the specified area (North Terrace, Kent Town- from Royal Hotel to the College Road) collects stormwater through side entry pits, where it then enters the underground stormwater pipes beneath Hackney Road and finally is discharged into First creek. All the stormwater infrastructure within the council area has been designed to meet the service levels as follows;

- Local / Arterial roadway – 1 in 5 year average recurrence interval (ARI) standard
- Trapped low points in roadway – 1 in 20 year ARI Standard
- Creeks – 1 in 100 year ARI Standard.

Therefore for the feasibility study an intense investigation will be undertaken in regarding rainfall data, catchment and sub-catchment areas, conditions of existing stormwater drainage system and their capacities to achieve given standards.

### **7.1.1 Proposed Work Scope**

#### **7.1.1.1 Field work**

- Assess the functionality and any deficiencies of the existing stormwater infrastructure within the project area to identify any contribution to the flooding condition;
- Investigate the condition and functionality of First creek;
- Collect water samples from First creek to check the discharging water quality;
- Survey of the topography of the area to identify the trapped low points and gravity flow;
- Survey of existing services and service stations in the area.

#### **7.1.1.2 Design Work**

- Collection of rain fall data within or near the project area and identifying the catchments, pervious and impervious areas to calculate the total rainfall runoff to meet standard design criteria.(Australian Rainfall and Runoff-Code of practice);
- Set up a Model (Drains Software) to identify the capacity of the existing stormwater system and to identify any excessive gutter overflow;
- Investigate the existing capacity of the creek to assess if an upgrade is required;
- Investigate the possible use of detention basins and soakage pits, and;
- Research and development of Surface runoff control technologies and water sensitive urban design features (WSUD) to harvest the rain water reducing excessive gutter flow, including;
  - Wetlands
  - Vegetated Swales
  - Non vegetated filters (including porous pavement)
  - Bio-Retention Systems
  - Infiltration Trenches
  - Soakaways
  - Leaky Wells
  - Sedimentation Basins

### **7.1.3 Deliverables**

After quantifying key information such as total surface run off and the capacity of the existing stormwater infrastructure through the design phase, the identified possible solutions will be collaborated with the findings of the geotechnical,

environmental and traffic/transport engineering departments, as well as urban development and planning principles. This will help identify the most effective solution, which may include:

- Enhancing the existing stormwater system to increase the capacity.
- Implementation of water sensitive urban designs (WSUD) technologies to harvest and to improve the quality of the rain water.
- Storage of excessive gutter flow (Aquifer storage and recovery system) for use in irrigation.
- Enhancing First creek to increase the functionality and capacity for proper discharge of the stormwater.
- Enhancement of Water quality improvement systems to prevent pollutants entering the river systems.
- Effective asset management planning, maintenance and standard service levels.

One or more solutions mentioned above will be investigated in more depth during the feasibility study stage to provide a sustainable and environmental friendly solution to resolve the excess flooding situation.

## 7.2 Transport Engineering

WaterSolutions has a team of innovative, dynamic, highly motivated and enthusiastic transport engineers and planners who have extensive industry experience and knowledge. They will provide strategic route planning, through our expertise in traffic and transport modelling.

Our experts have identified the following issues in relation to this project, these include;

- North Terrace is a major arterial route, into and out of the city centre;
- The road is busy from 5am to 3am most days;
- Works will require maintaining two lanes of traffic in and out of the city at peak times with 9.6 metres of trafficable road width, and;
- Great importance of safety due to proximity of the project area to St Peters Junior School

We recognise the importance of an appropriate traffic management plan for the surrounding area during the construction period to limit the impacts of the construction work on everyday road users and the surrounding landowners and businesses. The traffic management plan will show in detail;

- The traffic management proposed during each stage of all projects;
- All temporarily trafficked areas associated with the deviation of traffic;

- Proposals for the placement of temporary signs, advance direction signs, barriers and other warning devices including a list of the types and numbers of signs proposed to be used;
- Detour path for buses (where required);
- Proposed speed restrictions;
- Special safety regulations and controls during school hours, and;
- Comply with DPTI traffic management conditions.

## 7.3 Geotechnical Engineering

WaterSolutions is able to provide assistance in helping Tonkin Consulting manage one of the greatest risks in any project, subsurface conditions. Soil, rock and water are a core specialist service of our business. With an understanding of these components during the early planning phases of a project, we are able to provide advice in regards to meeting construction challenges and deliver success for the project.

Our experts provide, develop and implement practical designs and solutions for a range of infrastructure projects including roads, pipelines, water retention structures, bridges, buildings and drainage channels. To do this, we draw on knowledge from our specialists in:

- Geophysics and groundwater;
- Excavatability, Route Selection and alignment assessment;
- Constructability;
- Unstable ground conditions, slopes and retaining structures; and
- Dewatering and Drainage

For the feasibility study we will undertake an intrusive investigation to determine the nature of the subsurface conditions and provide the location of underground services, to help reduce uncertainty in drainage design. Geotechnical engineering plays a critical role in the design, construction and operation of drainage works. The following section outlines the proposed work scope, laboratory testing and extent of reporting and deliverables.

### 7.3.1 Proposed Work Scope

#### 7.3.1.1 Preliminary

- Development of a site specific health, safety and environment plan for the safe management of the intrusive site investigation;
- Review of the geological and soil maps of the area, and;
- Online Dial-Before-You-Dig Request.

### 7.3.1.2 Field Work

- Undertake traffic control using a specialist subcontractor
- Onsite underground service locating using a specialist sub-contractor
  - Locating the approximate location from the surface using;
    - EMR<sup>1</sup> Service Locating Wands
    - Ground Penetrating Radar (GPR)
  - Locating the actual location through
    - Potholing or non-destructive digging
- Drilling five (5) boreholes to a depth of 4 metres
- Conducting a Dynamic Cone Penetrometer (DCP) test to a depth of 2 metres adjacent to each borehole.
- On-site logging and sampling the soil profile by a Geotechnical Engineer as per AS1726

Borehole locations will be selected to allow for a broad coverage of the project area and are outlined in the attached Figure 1. Potholing, or non-destructive digging, involves the use of high pressure water or compressed air to break up the ground, which is then removed by vacuum. The water or air is used at a pressure that doesn't damage buried utilities, such as fibre optic cables, gas pipes, water pipes, sewer pipes, stormwater pipes, etc. It is an ideal method for exposing these critical utilities after they have been electronically located using either EMR or GPR to confirm the identity, size, number of services and depths.

The utility services will be located along the full length of the proposed options as outlined in the Water Engineering section, to determine the extent of service conflicts, and to avoid these clashes where possible. This will be undertaken with consultation with the relevant authorities as outlined in the key stakeholders section.

### 7.3.2 Laboratory Testing

The following testing is proposed to be undertaken in a NATA accredited laboratory on samples collected from the investigation;

- Atterberg Limits;
- Particle Size Distribution;
- Permeability, and;
- Concrete Durability Testing (Chloride, Sulphate, pH and Carbonate Levels)

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<sup>1</sup> Electromagnetic Radiation  
WaterSolutions Pty Ltd  
ABN: 93 056 894 5459

### 7.3.3 Reporting and Deliverables

Once the field work and laboratory testing has been completed we will be able to provide advice relating to each of the drainage design options, with information relating to the design options including;

- Subsurface soil strata encountered including the presence of rock;
- Groundwater levels (if encountered);
- Excavation and Diggability Characteristics;
- Vertical Load Capacity and Horizontal Soil Modulus;
- Soil Bearing Pressures;
- Aggressivity of the soil in regards to concrete durability, and;
- Retaining Walls (if required).

Information relating to construction will also be outlined, including;

- Earthworks;
- Backfill methods and compaction levels;
- Site-won material suitability;
- Excavation and Diggability Characteristics;
- Trench Excavation Stability, including information regarding batters, timbering, shoring, strutting, bracing, sheeting, piling, etc.
- Pavement Re-installation Specifications;

We are also able to provide earthworks testing and supervision in accordance with AS 3798- Guidelines on Earthworks for Commercial and Residential Developments.

## 7.4 Environmental Engineering

WaterSolutions has a significant environmental engineering capability and are considered as emerging leaders in environmental sustainability. WaterSolutions' environmental expertise, industry experience and knowledge of regulatory requirements allows us to facilitate innovative and cost effective assessments/investigations, remediation and treatment strategies.

The list below also highlights WaterSolutions' core Environmental competencies:

- Waste soil classification assessment.
- Environmental site histories.
- Site assessment and remediation.
- Groundwater testing and remediation.
- Environmental Impact Statements and their implementation.
- Environmental incidents and spillage control and management.



Various levels of environmental engineering will be required for input into the feasibility study. Our expert team has identified the following issues that have the potential to effect the environment and are listed in the following sections.

#### 7.4.1 Soil

In all the outlined water engineering solutions, consideration needs to be given to the excavated material. For this purpose, we will provide a soil waste classification for the material to be excavated to enable either onsite reuse or disposal to a licensed waste disposal facility.

The following waste disposal criteria will be applied for this project in regards to soils:

- SA EPA (2009) *Criteria for the Classification of Contaminated Waste*, published in Environment Protection (Fees and Levy) Regulations 1994 – 29.1.2009 Schedule 6, which underpin the requirements for Licensed Waste Facilities in South Australia;
- SA EPA (2010) *Standard for production and use of Waste Derived Fill*; and
- SA EPA (2010) *Waste Disposal Information Sheet: Current Criteria for the Classification of Waste including Industrial and Commercial Waste (Listed) and Waste Soil*, EPA 889/09.

For soil classification purposes, the South Australian Environment Protection Guideline for the use of Waste Derived Fill (WDF), requires a sample density of one sample analysed per 250m<sup>3</sup>, with a minimum of five samples collected for laboratory analysis per distinct layer of soil. This will be performed in conjunction with the intrusive geotechnical site investigation.

The soil will be tested for a SA Waste Screen, Heavy Metals, Total Petroleum Hydrocarbons (TPHs) and Polycyclic Aromatic Hydrocarbons (PAHs).

In addition, WaterSolutions will provide a risk management plan to allow excavation, stockpiling and transportation of waste soils.

#### 7.4.2 Stormwater

Stormwater is generated as rain falls onto impervious surfaces, such as roofs, footpaths and road pavements. Taking into account the general topography of the project area, the stormwater flows to the west, towards Hackney Rd, where it eventually enters First Creek, into the River Torrens and ultimately into the sea.

Stormwater runoff is typically high in contaminates such as heavy metals, hydrocarbons, organic matter and faecal coliforms. The majority of these pollutants are generated either from industry or from roadways.

The feasibility study will explore methods that can reduce the pollutant load in stormwater, targeting the design of stormwater pollution control devices including;

- Gross Pollutant Traps
- Trash Racks
- Litter Booms
- Sedimentation Basins
- Macrophyte Beds

### 7.4.3 Construction

We will provide advice regarding construction with reference being made to the EPA Codes of Practice<sup>23</sup>, and provide guidance relating to air and noise pollution during construction activities. All significant trees in the study area will be identified and protected, as stipulated by the South Australian Government's, Development Act 1993.

A Soil Erosion Drainage Management Plan (SEDMP) will be created and will detail the contractor's obligations to prevent environmental degradation of the site and surrounding areas.

## 7.5 Urban Planning and Development

The urban development and planning team at WaterSolutions is strongly focussed on assessing all aspects of the feasibility study to ensure that the identified solutions provide the best social, economic, physical and ethical environments. Developing solutions for the affected communities requires thorough research and understanding the current needs of the community, as well as projecting what is required into the future.

The City of Norwood, Payneham & St Peters have developed a Strategic Management Plan, '*CityPlan 2030: Shaping our Future*', which our experts have an in depth understanding of. Any changes to the communities' infrastructure has the potential to disturb the recreational amenity and opportunity, our experts will apply their knowledge in developing solutions that enhance the visual impact of the changes.

The Urban Planning and Development team at WaterSolutions will be working closely with the council and the key stakeholders to enhance the social acceptability for

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<sup>2</sup> Stormwater Pollution Prevention – Code of Practice for the Building and Construction Industry

<sup>3</sup> Stormwater Pollution Prevention – Code of Practice for Local, State and Federal Government

the proposed options, and outline the potential impacts of these options during the construction and post construction phases

## 8.0 Pricing



**TABLE 1: COST ESTIMATE**

<b>PROJECT:</b>	<b>North Terrace Drainage Design - Feasibility Study</b>			Date	05-Mar-15
				Subject	Cost Est
<b>CLIENT:</b>	<b>Tonkin Consulting</b>			Revision	1
<b>LOCATION:</b>	<b>Kent Town</b>				
<b>Item</b>	<b>Description</b>	<b>Unit</b>	<b>Quantity</b>	<b>Rate</b>	<b>Amount</b>
<b>1.00</b>	<b>Preliminary Tasks</b>				
	Identify and review background reports	hrs	225	\$120.00	\$27,000.00
	<b>ITEM 1.0 TOTAL</b>				<b>\$27,000.00</b>
<b>2.00</b>	<b>Site Investigation</b>				
	Service locations	hrs	15	\$120.00	\$1,800.00
	Verification of survey	hrs	15	\$120.00	\$1,800.00
	Review survey and service deepthing outputs	hrs	15	\$120.00	\$1,800.00
	<b>ITEM 2.0 TOTAL</b>				<b>\$5,400.00</b>
<b>3.00</b>	<b>Technical Analysis</b>				
	Stormwater	hrs	195	\$120.00	\$23,400.00
	Flow carrying capacity of First Creek	hrs	135	\$120.00	\$16,200.00
	Detention Basin	hrs	135	\$120.00	\$16,200.00
	WSUD	hrs	135	\$120.00	\$16,200.00
	Water Quality Management	hrs	135	\$120.00	\$16,200.00
	Traffic Management Strategy	hrs	135	\$120.00	\$16,200.00
	<b>ITEM 3.0 TOTAL</b>				<b>\$104,400.00</b>
<b>4.00</b>	<b>Evaluation and Reporting</b>				
	Feasibility Study	hrs	90	\$120.00	\$10,800.00
	Risk assesment	hrs	90	\$120.00	\$10,800.00
	<b>ITEM 4.0 TOTAL</b>				<b>\$21,600.00</b>

Item	Description	Unit	Quantity	Rate	Amount
<b>5.00</b>	<b>Project Management</b>				
	Project Manager	hrs	60	\$240.00	\$14,400.00
	Team Leader	hrs	360	\$200.00	\$72,000.00
	Urban Planning	hrs	60	\$120.00	\$7,200.00
	<b>ITEM 5.0 TOTAL</b>				<b>\$93,600.00</b>
<b>6.00</b>	<b>Field Investigation</b>				
	Logging and Field Supervision	hrs	10	\$150.00	\$1,500.00
	Drill Rig	hrs	10	\$150.00	\$1,500.00
	Ute Hire & Consumables	day	1	\$150.00	\$150.00
	Traffic Management	hrs	10	\$150.00	\$1,500.00
	Service Location including potholing	PC Sum			\$7,000.00
	Drainage Assessment Site Visit	hrs	2	\$240.00	\$480.00
	Environmental Site Visit	hrs	4	\$240.00	\$960.00
	<b>ITEM 6.0 TOTAL</b>				<b>\$13,090.00</b>
<b>7.00</b>	<b>Laboratory Testing</b>				
	Laboratory Preparation	hrs	1	\$120.00	\$120.00
	Particle Size Distribution	ea	5	\$85.00	\$425.00
	Atterberg Limits (1 point)	ea	5	\$95.00	\$475.00
	Permeability Testing	ea	5	\$145.00	\$725.00
	SA EPA Waste Screen	ea	5	\$220.00	\$1,100.00
	NEPM Metals Suite/PAH/TPH	ea	15	\$120.00	\$1,800.00
	Concrete Aggressivity Testing	ea	5	\$120.00	\$600.00
	<b>ITEM 3.0 TOTAL</b>				<b>\$5,245.00</b>
<b>6.00</b>	<b>Additional Works</b>				
<b>6.01</b>	Project Manager	rate only		\$240.00	\$ -
<b>6.02</b>	Team Leader	rate only		\$200.00	\$ -
<b>6.03</b>	Graduate Engineer	rate only		\$120.00	\$ -
	<b>ITEM 6.0 TOTAL</b>				<b>\$ -</b>
<b>TOTAL</b>					<b>\$270,335.00</b>
<b>GOODS AND SERVICES TAX (10%)</b>					<b>\$27,033.50</b>
<b>TOTAL COST INCLUSIVE OF GST</b>					<b>\$297,368.50</b>
<b>NOTE: Expenses and Materials used on the project will be charged at cost +10%</b>					

## 9.0 Duration of works

This expression of interest includes a timeline detailing how WaterSolutions intends to conduct the feasibility study for the North Terrace Drainage Design project. The timeline includes regular consultation with the client to ensure project goals and outcomes are achieved. The timeline indicates the path that will be followed in order to submit the feasibility study on April 10<sup>th</sup> 2015.

There are several milestones that will need to be achieved to ensure the project stays on track and the final feasibility study produced is to a high standard. These include the nomination of leadership positions, meetings with the client, regular report submissions and the submission of the feasibility study. The regular meetings with the client will allow them to have critical input into the feasibility study and ensure the project stays on point.

Reporting is required at several stages of the project in order to make recommendations to the client and critically assess the feasibility of different project possibilities. By including regular report writing it's possible to maximise the time available to do the required research.

This timeline shows a number interdependencies between tasks, by following the timeline and being aware of the critical path that needs to be taken; the feasibility study will be delivered on time and within budget. The timeline has been produced by WaterSolutions to effectively streamline the project and optimise the resources available to the company. This can be seen visually in the attached Gantt chart.

## **Appendix A: Schedule of Works**

## Appendix B – CV's

**Name:** Fergus Hamilton

**Role:** Project Manager / Civil Engineer

**Email:** [hamfw001@mymail.unisa.edu.au](mailto:hamfw001@mymail.unisa.edu.au)



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### EDUCATION

2013 – Present (2015 finish)	Bachelor of Engineering (Civil & Environmental Management), <i>University of South Australia</i>
2011 - 2012	Diploma of Engineering Drafting, <i>TAFE SA</i>
2008 - 2009	Certificate III in Engineering - Technical, <i>TAFE SA</i>

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### Relevant Project Experience

- Over 4 years of experience working as a civil draftsman, working on various mining project as well as the Perth Arena, WA
- UniSA preliminary design project on the new stormwater drainage, sewerage system and water supply for a new housing division in Strathalbyn, SA
- UniSA Soil Mechanics Project, Noarlunga Rail Line No.59 extension to Seaford, SA

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### TECHNICAL SKILLS

- Project Management, Risk Management
- OHS&W Training, White Card accreditation
- Laboratory testing of rock and soil
- Retaining wall design, slope design, shallow footing design, soil identification
- Proficient with engineering software – AutoCAD, Tekla Structures (Advanced), 12D, Inventor, Solidworks (Intermediate), ArcGIS, HEC-RAS, GALENA, SpaceGass, Strand7, CORD, CIRCLY, WaterGem, DRAINS (Baic).



**Name:** Joshua Magor  
**Role:** Quality Control Manager  
**Email:** [magjy004@mymail.unisa.edu.au](mailto:magjy004@mymail.unisa.edu.au)



**EDUCATION**

2011 - Current	Bachelor of Civil Engineering, UniSA
2010 - 2011	Certificate IV Property Services TAFE SA
2003-2006	Bachelor of Commerce, UniSA

**EXPERIENCE**

Project	Key roles and responsibilities
Barossa Water Treatment Plant Chemical Safety Upgrade	<ul style="list-style-type: none"> <li>• Commissioning Engineer</li> <li>• Quality Control Officer</li> <li>• Product design, drawings, selection and ordering</li> <li>• Operation and Maintenance Manual – for bulk caustic storage area</li> <li>• Maximo Asset Register</li> </ul>
Regional Pipeline Survey	<ul style="list-style-type: none"> <li>• Tender response</li> <li>• Project research, planning and implementation</li> <li>• Programming of GPS unit</li> <li>• Quality Control Officer</li> </ul>
Port Wakefield Automation Upgrade	<ul style="list-style-type: none"> <li>• Project design</li> <li>• Feasibility Study</li> </ul>
Eudunda Irrigation Network	<ul style="list-style-type: none"> <li>• System design</li> <li>• On-site investigation and system optimisation</li> <li>• Head loss calculations</li> <li>• Flow sampling</li> <li>• Feasibility study</li> </ul>

**TECHNICAL SKILLS**

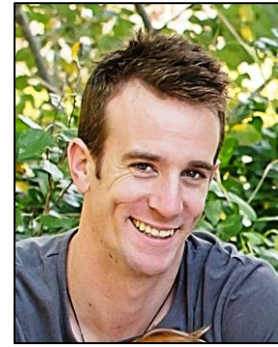
I have developed exceptional skills through work and study in various computer programs. Some of the technical skills I have developed are listed below.

- Manage technical processes and resolve technical issues independently or as part of a team
- Solve problems in a structured and systematic approach
- Excellent documentation and report writing skills
- Outstanding skills in organising and prioritising tasks
- Understanding of budgets and accounting
- Self-motivated and hardworking

**Name:** David Argent

**Role:** Senior Geotechnical Engineer

**Email:** [argdb001@mymail.unisa.edu.au](mailto:argdb001@mymail.unisa.edu.au)



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## EDUCATION

2013 – Present (2015 finish)	Bachelor of Engineering (Civil) (Honours), <i>University of South Australia</i>
2008 - 2009	Diploma of Management, <i>TAFE SA</i>

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## Relevant Project Experience

- Geotechnical Investigation for Directional Drilling Assessment for Gravity Drains, Mt Torrens and Birdwood
  - Bellaview Rd, Flagstaff Hill, Geotechnical Site Investigation and Soil Waste Classification
  - Clement Dr, Elijah St, Malone St, Morphett Vale, Geotechnical Site Investigation and Soil Waste Classification
  - Land Subdivision, Strathalbyn, Stormwater, Sewerage, Water Supply and Water Sensitive Urban Design Project for UniSA.
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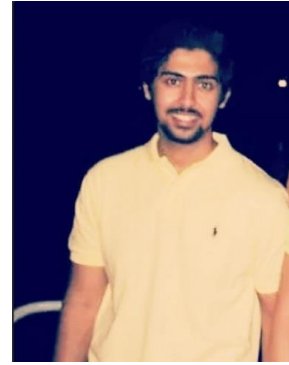
## TECHNICAL SKILLS

- Geotechnical and Environmental Site Investigation, including soil and rock logging, installation of groundwater monitoring wells, environmental sampling;
- Planning and implementation of site investigation for civil and infrastructure projects;
- Earthworks Advice and Supervision for Civil Engineering Projects;
- Laboratory and in-situ testing of soils and rock;
- Temporary Works Design and Assessment;
- Site Specific Work, Health and Safety Plans;
- Retaining Wall Design using Wallap;
- Slope Stability Analysis using Galena and Slide/W;
- Borehole logging and management using gINT;
- Geotechnical recommendations for pipeline design

**Name:** Bader Almasoud

**Role:** Senior Environmental Engineer

**Email:** [juwby001@mymail.unisa.edu.au](mailto:juwby001@mymail.unisa.edu.au)



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## EDUCATION

2012 – Present (2015 finish)	Bachelor of Engineering (Civil), <i>University of South Australia</i>
2011	Certificate IV in Engineering (Foundation Studies), SAIBT SA
2010	Certificate of English Course, Eynesbury College SA

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## EXPERIENCE

- Communication skills
- Problem solving
- Report writing
- Industry liaison
- Presenting information
- Meeting deadlines

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## TECHNICAL SKILLS

- Matlab, MicroStation and DRAINS
- 12D, Strand7 and HEC-RAS.
- GALENA, SpaceGass and C++
- Proficient with Microsoft Office Suite

**Name:** Anne Wickramaratne

**Role:** Senior Water Engineer

**Email:** [wicka002@mymail.unisa.edu.au](mailto:wicka002@mymail.unisa.edu.au)



## EDUCATION

2013 – Present (2015 finish)	Bachelor of Engineering (Civil) (Honors), <i>University of South Australia</i>
2012 - 2013	Diploma of Environment and Engineering , South Australian Institute of Business and technology

## Relevant Project Experience

- 12 weeks work experience at City of Port Adelaide Enfield, Technical Services.
- Investigation and Survey for stormwater system upgrade in Law hill Ct, Taperoo.
- Investigation of detention basins and aquifer storage and recovery systems in Lightsview land development.
- Land Subdivision, Strathalbyn, Stormwater, Sewerage, Water supply and Water Sensitive Urban Design Project for UniSA.

## TECHNICAL SKILLS

- Site supervision and surveying at Nawaloka Hospital refurbishment project, Sri Lanka
- Health and safety related work - Nawaloka Hospital refurbishment project, Sri Lanka
- Drainage System Design using DRAINS;
- Water Quality Modelling using MUSIC;
- Proficient handling of HEC-RAS , ArcGIS, WaterGEM, AutoCAD, Space Gass, Strand 7, Galena, CORD and CIRCLY software.
- Excellent report writing, documentation, meeting procedures and event organizing skills.

**Name:** Tri Ly Nguyen  
**Role:** Traffic Management Engineer  
**Email:** [ngutl010@mymail.unisa.edu.au](mailto:ngutl010@mymail.unisa.edu.au)



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## EDUCATION

2012 - Current Bachelor of Civil Engineering  
University of South Australia

## EXPERIENCE

Project	Key roles and responsibilities
Yalata Road and Drainage Project	<ul style="list-style-type: none"><li>• Government department liaison</li><li>• Community liaison</li></ul>
Engineers Without Border 2012 (Vietnam)	<ul style="list-style-type: none"><li>• Project manager</li><li>• Project research</li><li>• Product design</li></ul>
University of Adelaide Cultural Nights	<ul style="list-style-type: none"><li>• Executive Officer</li><li>• Volunteers Organizer</li></ul>

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## TECHNICAL SKILLS

I possess proficient handling of various engineering modelling software:

- Matlab, C++
- ArcGIS, GALENA, 12D, MicroStation
- WaterGEM, DRAINS, HEC-RAS
- Strand7, SpaceGass
- AutoCAD

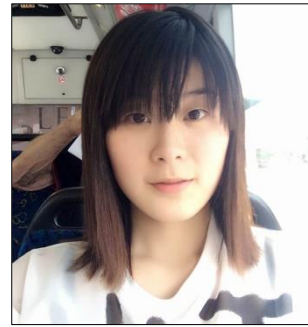
My other technical skills include:

- Systematic problem solver
- Outstanding reporting writing and documentation skills
- Motivated by excellence and hardworking
- Able to work effectively unsupervised or within a team

**Name:** JIANAN LI

**Role:** Urban Planning Manager

**Email:** [lijy079@mymail.unisa.edu.au](mailto:lijy079@mymail.unisa.edu.au)



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## EDUCATION

2012 – Present (2015 finish) Bachelor of Engineering (Civil) (Honours), *University of South Australia*

2011 - 2012 Diploma of Civil Engineering, *SAIBT*

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## EXPERIENCE

Project	Key role
UniSA Soil Mechanics Project	Project research
Water Sensitive Urban Design Project	Project design
JIAN GUANG YUAN municipal corporation summer intern	Construction management Calculation checks

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## TECHNICAL SKILLS

- Matlab, C++, Solidworks, MicroStation and DRAINS
- Strand7, HEC-RAS. CORD, CIRCLY
- GALENA & SpaceGass

## **Appendix C: Borehole Location Plan**