

Working in the country - Series One

What
will I be?
Rural Series

RURAL SURVEYORS

- Technical Assistant
- Graduate Surveyor
- Cadastral Surveyor
- Surveyor

Do you love lots of variety, spending time on computers *plus* being outdoors?

VOLUME 1

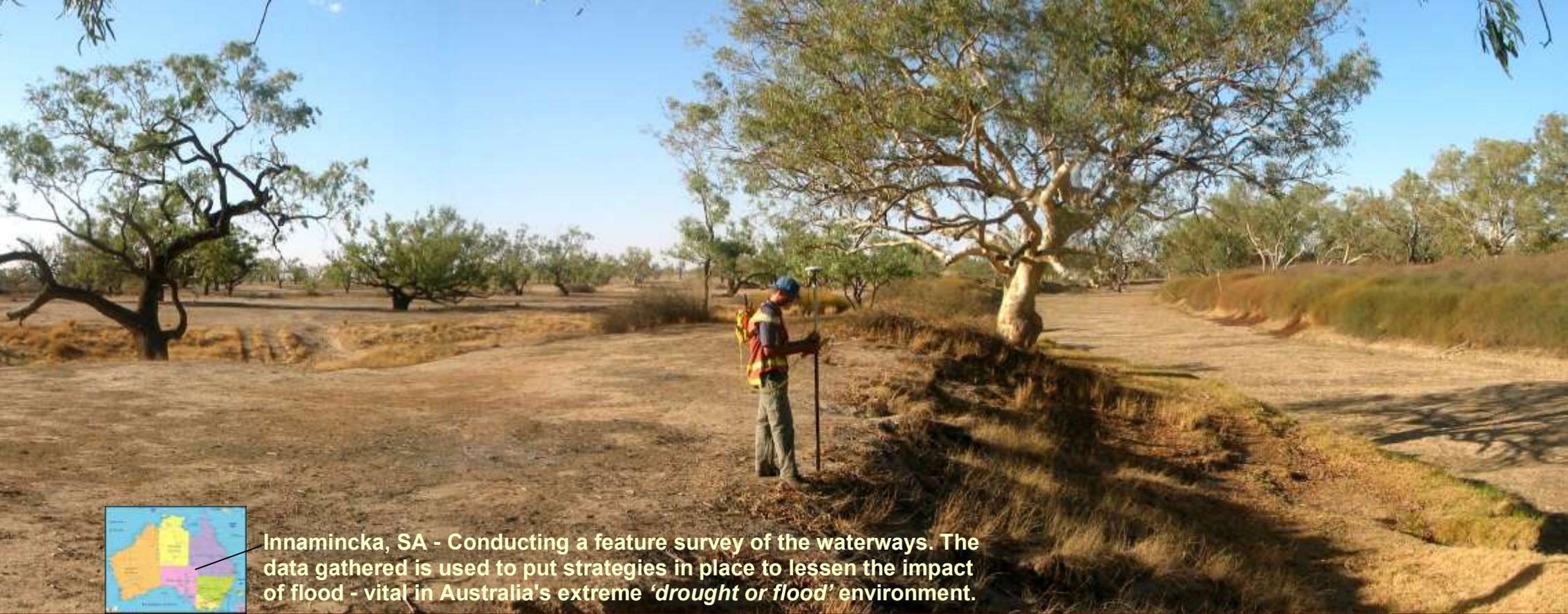


Proudly supported by:



SIBA

Spatial Industries Business Association
www.spatialbusiness.org



Innamincka, SA - Conducting a feature survey of the waterways. The data gathered is used to put strategies in place to lessen the impact of flood - vital in Australia's extreme 'drought or flood' environment.

WORKING IN THE COUNTRY

RURAL SURVEY ASSISTANT RURAL GRADUATE SURVEYOR RURAL SURVEYOR

Written and compiled by Beverley Neil

Copyright © 2013 Beverley Neil, d'Scriptive Words



This series is dedicated to
my beautiful daughter, Breanna, who was
born in the city, with a soul for the country...
...and to all those who, as they grow,
will discover, connect with and love our land.

*Thanks and gratitude to Spatial Industries
Business Association for their belief in and
support of this book*

Acknowledgements:

We acknowledge the Traditional Owners of this awe-inspiring land

Thanks to Peter Baxter of Baxter Geo Consulting Pty Ltd for his on-going support
and enthusiasm for this Rural Surveyors book

Thanks to Adam, Laura and Dale who kindly agreed to be interviewed

Thanks to Marie Chandler of Office Support Online for technical support

All rights reserved. No part of this PDF/book may be produced in any form or by
any means whatsoever - graphic, electronic or mechanical - including printing,
photocopying or information storage and retrieval systems, without permission in
writing from the Author.

Author: Beverley Neil

Design: Beverley Neil

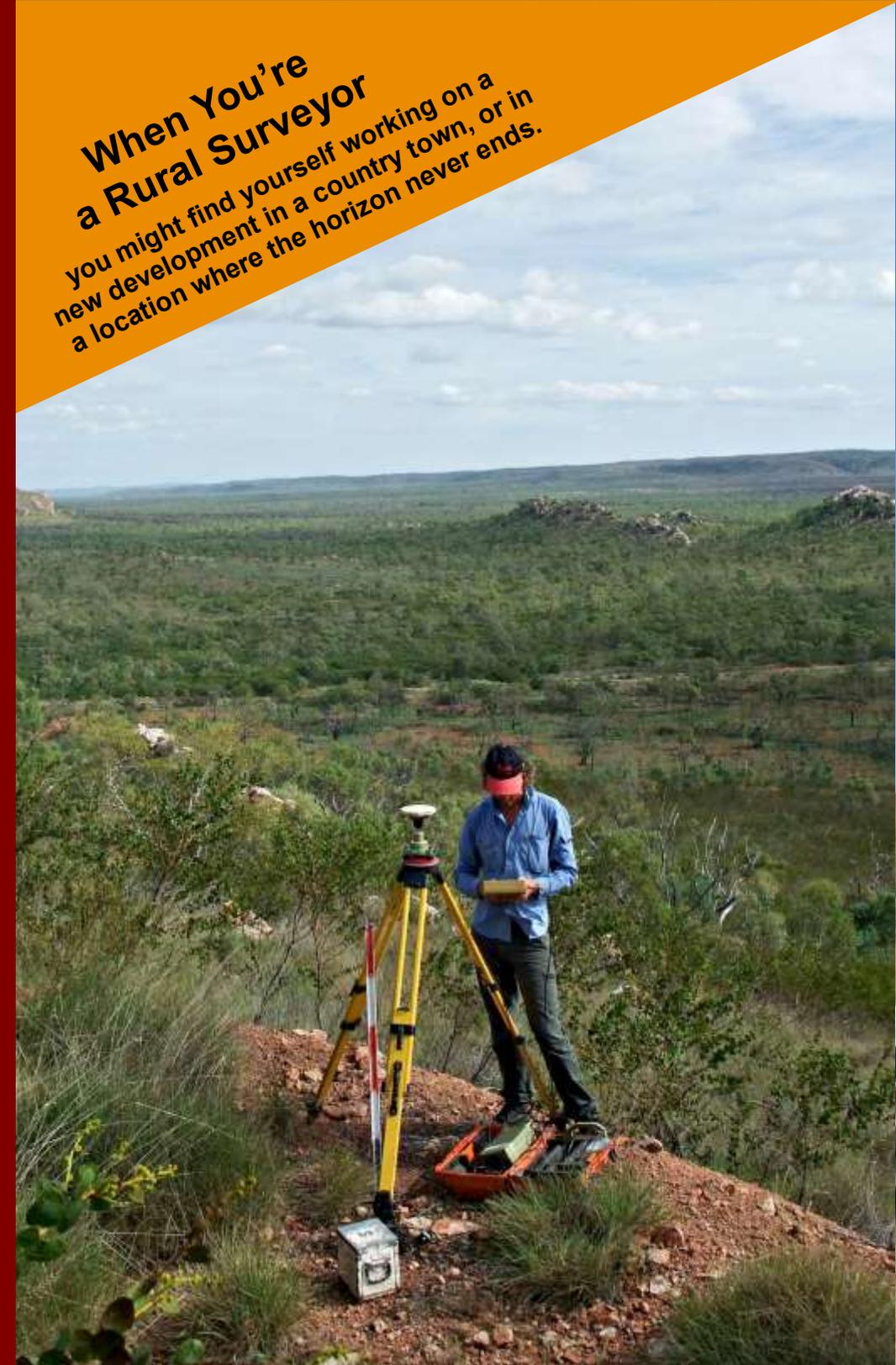
Cover design: Inspired by Evelyne Matti, eMatti Support Services

Desktop publisher: Beverley Neil

CONTENTS

Just a Bit of History	1
and a Few Interesting Facts	2
Here's a Couple of Surveying Thoughts	3
Surveyors and Their Toys.....	4
Meet Adam - He's an Survey Technical Assistant	6
Meet Laura - She's a Graduate Surveyor	10
Meet Dale - Surveying in far North West Queensland	14
Meet Peter - A Rural Surveyor for 30+ Years	18
Would You Like Being a Rural Surveyor?	21
Resources	21
And How Do You Become One?	22
Time for Action	23
Take Control	24
Resources	25
Books in Series	26
Photograph Credits	26

**When You're
a Rural Surveyor**
you might find yourself working on a
new development in a country town, or in
a location where the horizon never ends.





Just a bit of history

Are Rural Surveyors really modern day explorers?

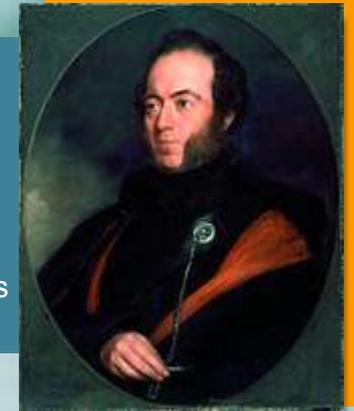
When we think of Australia's early pioneers, people such as Thomas Mitchell, James Meehan, John Forrest, Charles Sturt and William Lawson, we usually think of them as 'explorers'. In fact, they were also 'surveyors' finding tracks through rough terrain and mountain ranges and carefully marking out the best routes to follow, taking measurements with rustic instruments and the stars.

One of the most important roles and people in the government is a Surveyor - the Surveyor-General. Australia's first Surveyor-General, arriving with the first fleet, was surveyor/soldier, Augustus Alt - a controversial figure even at the time whose background is disputed by some historians (*Tip: Why not do a bit of research of your own!*).

The early 'explorer surveyors' mapped, measured and recorded the terrain of Australia as a new colony, identifying transportation routes and sites for new settlements. Many of these routes have become our national highways and major roads. There are thousands and thousands of highways and roads around Australia. It's fascinating getting out a map or atlas and tracking the routes they take.

Major Sir Thomas Livingstone Mitchell was one of Australia's first 'Explorer Surveyors'. In 1828 he was appointed Surveyor-General of New South Wales, but he had certainly earned his title by putting in the hard yards surveying huge tracts of Eastern Australia under extremely difficult conditions and deciding where to position dozens of roads, bridges and towns.

Interestingly, many towns are positioned around 100km apart as this was the distance comfortably travelled by a horse each day.



Basically, surveying is all about accurately mapping, measuring, calculating and marking in both 2-dimensions and 3-dimensions - and doing it very accurately! This may be anything from an ocean bed or the sky, the polar icecaps, a mountain range, a new golf course, a bridge or a land boundary.

Surveyors have been around for a long time. The earliest recorded reference to a 'Surveyor' is written on an ancient Egyptian stela (stone tablets) dated around 3005 BC - the Palermo Stone - and in many ancient civilisations Surveyors were among the elite. Experts believe Stonehenge was surveyed first by using pegs and ropes before construction began around about 2500 BC. Surveying was, and still is, a vitally important profession.





John Morgan surveying in the Kimberley

Meet John Morgan

- a true adventure loving Explorer Surveyor

John Morgan led the last official horse mounted survey expedition through the Kimberley, in the far north of Western Australia, to complete the '1954 North Kimberley Survey'.

In 1968 he was appointed Surveyor-General of Western Australia. Though this was a high honour, he always thought of that 1954 survey trip through the Kimberley as the highlight of his career.

In 2006, surveying students from Curtin University, WA, re-enacted a short section of Morgan's Kimberley Survey, following in the expeditions footsteps. John Morgan died in April 2010, acknowledged by his peers as Australia's last true explorer.



John Frank Morgan as Surveyor General of Western Australia

and a few interesting facts



Finding buried treasure...

In 1984, surveyor, Frank Leahy, re-calculated the coordinates and survey results recorded by explorers, Burke and Wills (William Wills was the surveyor of the pair). This led him to find a number of Burke and Wills' camps, including their 'Plant Camp' where, desperately short of food and with the camels dying, they had buried their astronomical instruments. At intervals, for more than 20 years, Leahy returned to search for the buried equipment.

Finally, in 2007, he located a spirit bubble, part of a sextant, fittings from instrument cases, bullets and a sewing kit, 150 years after they were left behind. In 2009, an archaeological survey found the last of what equipment remained and confirmed it was indeed the Burke and Wills' 'Plant Tree'.

Blazed 'Plant Tree' indicating the long searched for 'Plant Camp' - 100 kms north of Birdsville, QLD



Early Explorer Surveyors would 'blaze' the trees (cut with axes) as markers, or sign posts. More than 150 years later this blaze* still clearly marks the way.

*Burke and Wills Camp 88, also re-discovered by Frank Leahy



Talk about surprising!

This chunk of a space rocket was discovered by a team of surveyors along the Northern Territory/Queensland border.

Source: <http://www.abc.net.au/news/2008-06-04/rocket-wreckage-found-in-outback/2460640>

Did you know?

Long before European settlement, Indigenous tribes had established designated 'track-ways' and trade routes across Australia.



As with almost all jobs, Surveyors can be males or females.

Back in 1918 in the U.S.A. there was an all women survey crew working on the Minidoka Dam Project in the state of Idaho. Due to the weight of the equipment back then, this was a major achievement. Today, equipment is far lighter and easier to carry.

On page 15, find out what a female surveyor loves about her work.



Source: <http://en.wikipedia.org/wiki/Surveying>

Here are a couple of surveying thoughts next time you go on holidays or bomb dive into your swimming pool...

Surveyors also played important roles in working out the best place to build structures such as the Snowy Mountains Hydroelectric Scheme and all the major and smaller dams and reservoirs as well as the route to lay the water pipes. In fact, a team of surveyors working out in a country area made it possible for you to have water for drinking and bathing and to fill your swimming pool.

Australia is a huge country with vast areas of farming and grazing country, bushland, arid deserts, tropical forests and wetlands, and mountain ranges. While lots of people worked on building the roads, you can often thank the surveyor for being the first person on the ground, and for finding the best route to take you to your favourite holiday destinations.

Did you know?

Surveyors are involved at every level, working with environmental planners, engineers, architects, rail, road and infrastructure planners, farmers, archaeologists, and far more.

Surveyors are in high demand, especially in rural areas, which means it is far easier to get a job when you graduate than with some other fields of employment - and there is tons of variety!

This photo is of the Lyell Highway (and a little red car) over the Bradshaw Bridge which crosses the hydroelectric storage at Lake Burbury, in the Queenstown region of Tasmania.

Constructing the road, the bridge, the water storage area, the hydroelectric scheme — and far more — all required a team of Surveyors before and during each project. Nothing could have happened without at least one Surveyor first being on the job.

Surveyors and their toys

The way Surveyors take measurements has not really changed over the years, but the equipment has massively improved and it is far easier to get accurate measurements than when only sticks, pegs, string and chains were used.

Now, Rural Surveyors use instruments such as laser range finders, robotic-guided total stations with electronic distance measuring devices, optical and laser levels, GNSS (Global Navigation Satellite Systems) and more. It is even possible to email the data straight back from the paddock or mountain range to a computer sitting in an office thousands of kilometres away.

There are dozens of surveying tools on the market, plus they are constantly being updated or created, but these images will give you a rough idea of the fascinating equipment you'll be playing with as a Rural Surveyor...



3-D Guidance Display unit for farming application



Machine guidance control unit

SmartStation using



Optical Level



Laser Scan Station



Theodolite



GNSS/GIS Handset



Fast fact...

Yes - there are fully automated graders that are building roads!

Instructions are uploaded to a machine on the grader telling the blade when to go up and down and when to tilt and how much to tilt. All these instructions have been measured out, keyed in to a computer and uploaded to the grader by a Surveyor.

The grader knows where it is in relation to the instructions via GPS signals. The GPS screen displays a red line for the driver to follow and instructions are also sent directly to the blade.

Farmers use this technology for ploughing and planting, while diverse other industries use the technology for their own particular needs.



Surveying on 'Arkaba Station' in the Flinders Ranges, SA



Survey Assistant

What does a Rural Survey Assistant Do?

Also known as a 'Technical Assistant', a Survey Assistant undertakes a wide variety of jobs. Working out in the field, he or she assists senior, or Licensed/Registered Surveyors to complete jobs out on site by hammering in pegs, identifying survey marks, making sure the senior surveyor has all the tools and equipment needed for the day's work, downloading data, and ensuring the work is completed quickly and correctly.

In the office, a Survey Assistant may be asked to draft plans on the computer working through a 'CAD' drafting program, which is used to show all the work completed in the field. Survey Assistants also maintain all of the survey equipment and vehicles, keeping them clean and making sure everything is in working order. So, all up a responsible and important job.

Surveying Technician: Another, more senior, role which also supports the Surveyor is a Surveying Technician. Some of the many and varied duties a Technician can perform is to upload information into the instrument and use this information to make additional measurements, check and analyse the data, draft plans using drafting software and set out points on a construction site or in a mine.

Q&A INSIGHT

Meet Adam - He's a Survey Technical Assistant



“We get to go to some pretty remote and far away places, which I would never have known existed outside of work.”



Road set-out of Scenic Drive, Beachport, SA



Location:
Mount Gambier,
South Australia

What got you interested in surveying?

ADAM: My interest originally started by seeing a tripod set up on the side of a road, and wondering what they were used for. I did some research and found that most of the elements of surveying were things that I enjoyed, such as working with computers and plenty of outdoors work.

My job title is a 'Technical Officer', which basically means I look after maintenance of all our surveying equipment, and assist the more senior surveyors with field work and drafting duties.

What rural areas do you travel to?

ADAM: We travel across the entire South East of South Australia, ranging from here in Mount Gambier, to as far north as Meningie and Coonalpyn. We do a lot of survey work in coastal towns such as Robe and Kingston, a lot of those jobs being road construction for local councils and sub-divisional works.

What do you love best about being a Survey Assistant in a rural area?

ADAM: It's the opportunity you have to see parts of the country that you wouldn't otherwise ever be able to see. We get to go to some pretty remote and far away places, which I would never even have known existed outside of work. I also like that each day is different being a surveyor. One day you might be in the office working on the computer, the next day you could be hundreds of kilometres away working in the field. I would definitely recommend surveying as a career choice.



Working on the Mount Gambier Airport runway resurfacing project

What do you think are your greatest challenges as a Survey Assistant?

ADAM: The greatest challenge is being 100% sure that what you are marking out on site or drafting in the office is correct. If we were to make a mistake with our calculations when it comes to marking out a new building, and the building is erected incorrectly, that is a major problem. So we always need to be checking and double checking our work to be confident what we are doing is correct.

On a personal level, the downside is that sometimes you can be away from your family for extended periods of time, sometimes a week at a time. We also need to be aware of working in extreme weather, and watching out for local wildlife like snakes and lizards.

What are the upsides and downsides to living in a rural town?

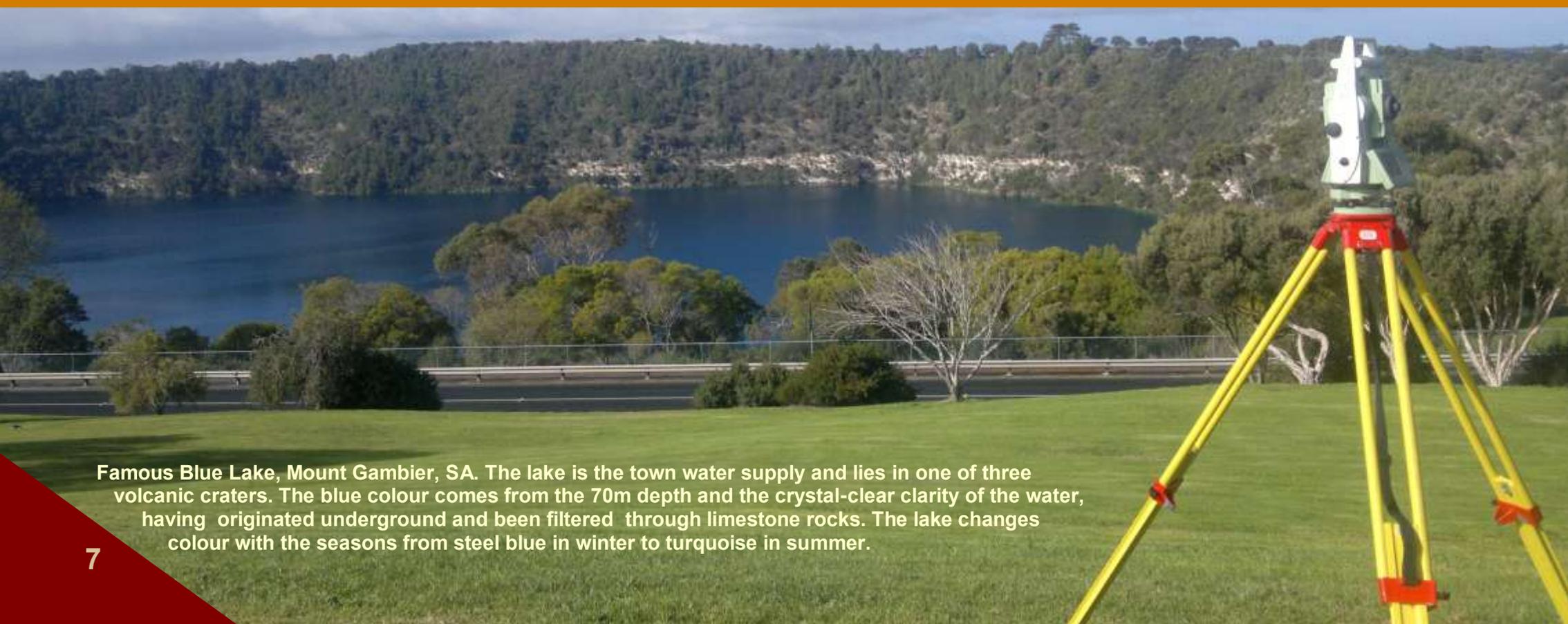
ADAM: What I like best about living in a rural town is that everything is a lot closer and there is a real sense of community. It only takes five minutes to drive to and from work every day, and the roads are not as busy. The downside is missing out on some opportunities for work, such as improving your qualifications.

What advice would you give anyone wanting to move out of the city and live in a rural area?

ADAM: Living in a rural town is definitely a good choice for a career, as it gives you a really good spread in terms of city and rural lifestyle. There really isn't much in Mount Gambier that you miss out on compared to living in a capital city, and in my opinion it's a much more relaxing environment for your family.



Main corner re-development, Mount Gambier, SA



Famous Blue Lake, Mount Gambier, SA. The lake is the town water supply and lies in one of three volcanic craters. The blue colour comes from the 70m depth and the crystal-clear clarity of the water, having originated underground and been filtered through limestone rocks. The lake changes colour with the seasons from steel blue in winter to turquoise in summer.

Making the most of our precious water...



Working on surveying 19 kilometres of new irrigation channels

Did you know Australia is the driest continent on our planet?

It stands to good reason then that we not only look after the health of our inland waterways, but that whenever environmentally safe, and possible to do so, we also maximise the benefits of every drop of water.

In this project to expand the **Ord River Irrigation System** (Lake Argyle) in Far North West Australia, Surveyors surveyed 19 kilometres of new irrigation channels, 14 kilometres of new roads, the sites for new irrigation control structures, and uploaded machine guidance to more than 40 machines on the project site. Do you think that project could have got off the ground without the surveyors?

This project expanded the irrigated agricultural land in this East Kimberley region to 22,000ha, supporting crops including bananas, sugar cane, melons, mangoes, pumpkins and more.



Irrigation channel in full flow



Location:
Ord River/Lake Argyle,
East Kimberley, WA



Section of new irrigation channel



Graduate Surveyor

What does a Rural Graduate Surveyor Do?

A Graduate Surveyor has already undertaken his or her Bachelor of Surveying. This may have taken up to four-years full-time study to complete, though the length of study can vary from state to state. To move on from being a Graduate Surveyor it is necessary to gain one year's field experience.

According to Laura, working as a Graduate Surveyor involves, "Lots of driving and carrying heavy stuff!" Depending on the type of surveying that is being carried out, a Graduate Surveyor could be working outdoors doing a variety of practical, hands-on tasks, or may be working on computers, using programs such as CAD, and data management.

In Laura's case, a typical day could be spent looking after the day-to-day running of the gold mining operations, using GPS to set out information on the ground for the drillers and diggers, and also measure points to take back to the office to upload onto the computer for the engineers and geologists to analyse.

She also undertakes computer processing each day, mostly to calculate volumes of rock and dirt that have been blasted from the mine, and make plans including volume calculations, the overall dimensions of the pit, emergency and evacuations plans, and more.

Q&A
INSIGHT

Meet Laura - She's a Graduate Mining Surveyor in the Goldfields

“I enjoy how physically active the job is. When we have a blast I calculate how much rock has been blasted and make plans for each blast that goes off.”

Location:
Kambalda,
Western Australia



What got you interested in surveying?

LAURA: I really enjoyed maths during high school, so that was a big part of it. Surveying was an option that involved maths but is more useful to study than pure mathematics because it leads on to plenty of job opportunities.

Did you deliberately look for a job in a rural area?

LAURA: I grew up in a city area but when I started applying for jobs I didn't even look at where they were. I just applied for all the graduate surveyor jobs that I could.

So what do you think about working in a rural area then?

LAURA: I love getting to work outdoors every day. I spend about 80% of my time out of the office. I enjoy how physically active the job is, lots of walking around in the bush and banging in pegs.

It's a great career for people who enjoy the outdoors, it can be challenging both physically and mentally which is great.



You get how massively big the mine is when you see how small the excavator appears to be!

What do you think are your greatest challenges?

LAURA: I'd never driven off-road before this job so that was definitely a challenge. I have to go out in the bush a lot and to places not many people go so the roads are always a bit dodgy, and once it rains it gets really, really slippery.

Have you ever had any mishaps?

LAURA: Every surveyor seems to have a bogging story. I was walking round on top of a waste dump one day after it had been raining. I had my gumboots on but the mud was so thick that I was sinking into it, until I ended up stuck. I had to walk back to my Ute in my socks and go get a shovel to dig my gumboots out.

Do you find there are down sides to living in the country?

LAURA: Sometimes it feels like I'm missing out on things by living so far away from a major city. I love music so if I lived in Perth then I'd go to lots of concerts but because I live here I've missed out on some of my favourite bands.



Then what is it you like best about living in a rural town?

LAURA: I love looking out my window and just seeing bushland and the salt lake, and there are lots of weird little geckos that are really cute. There's no traffic to deal with, rush hour traffic in Kambalda is about five cars at the main intersection.

“Do your research and look into the place you want to go to. Visit it and talk to the people who live there to see if it's somewhere you want to live.”



Multi-sports facility, Kambalda, WA



Land sailing on salt lake, Lake Lefroy, Kambalda, WA



Surveyor

What does a Rural Surveyor Do?

Surveyors may no longer measure the dimensions for tombs housing the mummies of dead kings, but they do still work on interesting challenges and projects, sometimes even assessing archaeological sites.

They work on mines, airports and tunnels, provide information for computer databases on boundaries and land features, and data for Geographical Information Systems (GIS), map out watercourses and irrigation channels, and the list goes on. Before any construction project begins a Surveyor is involved, so this is just a brief glimpse of the hundreds, if not thousands, of areas that require a Surveyor.

Surveyors need great communication skills, the ability to work as a member of a team and to really listen to and understand what is required to successfully complete a project. For example - when working with the construction industry, Surveyors measure the area as it is in 'real life' so that designers can create workable, practical designs. The reverse is also true - Surveyors then take architects, engineers, or town planner's designs to mark the structure out in the real world ready for construction to begin.

Q&A INSIGHT

Meet Dale - He's a Surveyor in Far North West Queensland



Location:
Mount Isa,
Queensland



Did you grow up in a city or country area?

DALE: I grew up on a dairy farm in Upper Natone, a farming community with a population of about 100, located 30km south of Burnie in Tasmania.

Then how did you come to be working in Outback Queensland?

DALE: Like so many other rural Tasmanians, I was a victim of the industry shutdown and forced to the mainland to look for work. I was looking for a regional area, and being fresh from university I was keen to further my skills.

A regional survey practice provides a greater range of experience as we need to cover all the bases and can't specialise. That also means we don't get trapped in the monotony of performing the same or similar

task day in day out, as can happen in larger urban areas or with fly in fly out mine surveyors. Outback Queensland was booming and there were plenty of opportunities.

What got you interested in being a Surveyor in the first place?

DALE: I'm not sure. I remember a Surveyor doing some work for my father as a child and was amazed at his ability to tell us how high the new dam would get and the exact position of the property boundary. I wanted to do something a bit different, not mainstream like an engineer or lawyer etcetera.

What qualifications do you need and where did you get them?

DALE: Bachelor of Surveying and Spatial Sciences from the University of Tasmania.

Fast Fact

A Cadastral System is a register of property ownership - the system that we use here in Australia. It provides strong security for land owners and purchasers. A Cadastral Surveyor measures up property boundaries.



Surveying a boundary near Mount Cobalt, North West Qld

“It’s the best place to get experience, and the sense of community in a rural area is great.”

Have you had any funny or unusual experiences?

DALE: Something funny happens on most all of my trips.

One night, travelling back from Selwyn on a dirt isolated road at 11pm, the headlights died and we had to make do with the orange flashing rotating light on the top of our vehicle so we could see.

Eventually, after we were near hypnotised by the constant flashing, we did a bit of a MacGyver with the light and managed to turn it into a spotlight.

I had to ring the boss at midnight to come and get us as it was not safe to drive like that on the public road. Trouble was, our makeshift light was so bright he ran off the road. Not good!

What areas do you travel to, and what surveying jobs do you do in those areas?

DALE: Karumba, Normanton, Cloncurry, Gunpowder, Dajarra, Doomadgee, Selwyn, and Julia Creek and across into the Northern Territory. Mainly mining based surveying whether it be tenure, engineering, setting up mine grids or locating resources. I also carry out Cadastral Surveying in Mount Isa and Cloncurry.

What do you love best about working as a Surveyor in an Outback region?

DALE: Variety. My week can involve travelling to several towns and several mines, carrying out several types of surveys and working in different aspects of the profession. I also love the community involvement.

Then what do you think are your greatest challenges?

DALE: Heat, travel and time away from family.



Near Selwyn, North West Qld, receiving Real Time Kinematic GPS corrections being transmitted over large distances via radio

“Social life is better in a small local community. I know most people will find that hard to believe but I have met so many great people.”

For example, we built a new football ground from scratch with no government help, only local people and businesses donating time and equipment. We now have one of the best facilities in the region. Worth over \$300,000.

My best mate, who had been in Mount Isa for five years, had a motorbike accident and became a paraplegic. With the help of the community in Mount Isa we raised twice as much as the needed \$7,000 to buy a hand cycle so he could compete in the 203km border ride. With the help of the community he trained and managed the ride. We are now working towards getting him to the Paralympics.

Social life is better in a small local community. I know most people will find that hard to believe, but its hard to meet people in a big city because people tend to keep to themselves. I moved to Mount Isa seven years ago and have met so many great people.

What advice would you give anyone wanting to move out of the city and live in a rural area?

DALE: Its a great place to get work experience and the sense of community in a rural area is great whether it be with sporting clubs or whatever you enjoy. I'm a member of a cycling club, a kayaking club, football and cricket clubs. Make sure you are part of the community (not a fly in fly out) else you will miss out on so much that these areas have to offer.

Monument at Royal Flying Doctors Service Centre, Mount Isa



Mount Isa, Qld, is one of Australia's major mining towns



Surveyor

What sort of projects do **RURAL SURVEYORS** work on?

The simple answer is - every kind of project. Truly, the list is almost endless but here we will concentrate more on rural surveying. Even then the list is vast.

Rural Surveying projects can include measuring out, building, widening or repairing roads; establishing accurate boundaries between properties; mapping out heritage sites; identifying the best spot to build dams and retaining walls; measuring out and working on bridges and tunnels; working with the mining industry carrying out exploration, measuring dump truck capacity, soil removal and more; setting out and repairing railway lines; working in small towns measuring up for land subdivisions or other major construction or infrastructure projects such as hospitals, schools and airports; providing accurate measurements for irrigation, flood mitigation and water management and supply - and the list goes on and on.

Our next surveyor, Peter, even measured up inside a bank vault.

Q&A INSIGHT

Meet Peter - He's been a Rural Surveyor for 30 plus years



Peter's in-office work environment - 7 screens with access to up to 3 computers



Location:
Tamworth, NSW



Post Office, Tamworth NSW

How did you come to be a Rural Surveyor?

PETER: I found out about surveying by accident. I'd finished school, not knowing what I wanted to do until my father found me a job as a Chain Man. One day the Surveyor told me he was 'sacking me' from the job to go back to school to study and become a Surveyor. I've been a Surveyor for 30 years and I love my job. I want to encourage lots more Surveyors to come and live and work in rural areas.

So what do you love best about working as a Surveyor in the country?

PETER: Being outdoors and going to places where not many people have been. I've done jobs where the owner has said, 'Tell me what's up the top of that mountain. We've owned the property for a hundred years and no one has been up there'. Sometimes it does feel like I'm trail blazing, and there's always something different to do. One job I might be working in a mine site, then on a railway, and the next job I'm in the mountains taking measurements.

Actually, many of my friends who work in the city get jealous when they hear about the great things we do and places we go.

Fast fact

A Chain Man assisted the surveyor taking measurements using a chain. There are 100 links in this special kind of chain and each link is 201 millimetres.



Bogged!! There can be lots of challenges...

SO, WHAT IS A 'GATOR'?

A vehicle which has been modified to hold a prism or GPS to then be used for measuring long curving or undulating distances.

A robotic theodolite or GPS receiver tracks the gator and records measurements as the Surveyor drives along.



... plus fun ripping around in a gator!

What is the best thing about being a Rural Surveyor?

PETER: You get to see a lot of things that other people don't see. One job I had to measure up inside a bank, so I was locked inside the vault with all the money. Mostly I am in the country setting out a mine or railway lines or measuring up a boundary. Once I did laser scanning on a road that had subsided and fallen into a river. I used a special machine that took 3-D photos which were uploaded into a computer to build-up a model to help build the new road.

One job I spent five years planning, designing and building the biggest egg farm in the southern hemisphere. At the time it was the most modern egg farm in the world. The design **won a prize for Environment & Planning at the Excellence in Surveying Awards.**

I've found surveying pegs when I've been out in the bush that are over 150 years old. I think it's fantastic. I'm measuring out where someone, another Surveyor, has also been measuring out about 150 years before me. The possibilities of being a Surveyor are only limited by your imagination.

What do you think are your greatest challenges?

PETER: It really is a great job but I guess the greatest challenge is being physically fit. To be a Rural Surveyor you need to like working hard in the outdoors and be able to rough it, sometimes sleeping out in tents and sometimes working in very hot temperatures.

Has the equipment you use and the way you work changed a lot since you started?

PETER: Today with technology we use GPS a lot for our measuring, and computers are a huge part of our business. I do a lot of programming machines such as graders and scrapers on road building projects. These days we can put a design into a computer program, convert it to a language the grader can understand, then set it up so the grader is directed where to go via a satellite sending down signals to the GPS unit in the cab. In some machines the driver does not even have to drive the grader. It is entirely directed by the computer program via satellite, so it is really important we get our calculations correct.



What has been your funniest experience?

PETER: I do a lot of surveys compiling information for Aboriginal heritage studies. One day I drove out onto a cattle property with two of the Aboriginal Elders to conduct one of these studies. The owner of the property was doing some controlled burning-off in the gully where we were going and the air was a bit smoky.

We stopped at the top of the hill overlooking this gully and the younger of the Aboriginal Elders, Bob, got out to open the gate for me. As he was coming back to get into the vehicle Bob saw a big lizard and called me to come over and see it - so I turned off the engine and went over to have a look. The other Aboriginal Elder, Neville, got out of my 4WD and was leaning against the bonnet just watching us.

All of a sudden my vehicle took off rolling down the hill. I started yelling out, "Stop it! Stop it!" and running after it. The slope of the track made the vehicle turn to the side and start to roll across the hill towards the fire. Just as I got near the vehicle it rolled into the fire, so I jumped in and started up the engine and—boom—a big ball of flame burst out the back as the exhaust fumes caught on fire and I raced the 4WD back up the hill away from the burn off.

When I got to the top there was Bob and Neville laughing their heads off at me. Bob said, 'I'm glad you saved that car. I had my sunglasses in there. I could have lost them.' I had to laugh too. It was pretty funny.

Peter...



Surveying on a railway



Measuring trucks to estimate the quantity of coal they can carry



Finding a stowaway in his theodolite

Would you like being a Rural Surveyor ?



What are the challenging bits

Ok, here's the tough bit - it takes a fair chunk of study, but when you're studying for something you love, to do a job you love, then you won't find that study nearly as difficult. *And here's a quick tip* - if you want to be a Surveyor, now is a great time to start putting a bit of extra work into your maths. After all, can you imagine getting your distances wrong when you're measuring up for a bridge!!

Working in country and Outback areas can sometimes be challenging. You may have to work in very hot and sticky temperatures in place like the Northern Territory, or in freezing cold temperatures in places like the Snowy Mountains, and no matter where you are in Australia there are usually lots of flies.

Often, Surveyors will be walking through bushland and long grass and need to keep a careful eye out for snakes, scorpions and venomous spiders. Sometimes the Surveyor will need to negotiate steep slopes or balance on the edge of cliffs.

They need to walk long distances, climb steep mountains, walk through gorges, and drive over extremely rough terrain with no roads or even tracks, so Surveyors need to be fit, be able to solve problems, and to not be afraid of taking on lots of challenges.

How about the good bits

Rural Surveyors also get to experience the natural environment, work out in the open spaces, watch kangaroos hopping by in the distance or hawks hovering overhead against a clean, clear-blue sky, and listen to the wind sighing through the open grasslands or tall timbers instead of the roar of traffic.

Rural surveying work is often performed in out of the way places, which can mean sleeping at night in a tent or a caravan under a beautiful starry sky, or in rooms at the nearest country pub where the Surveyor can make friends with the local people. What's more, sometimes Surveyors still do get to feel like trail blazers, marking out the tracks and finding the best way through difficult country.

Resources

It's always a good idea to completely investigate a potential career direction. You can do your own research on the Internet, plus these resources are fantastic for finding out more about Surveying (and Spatial Science) -

Destination Spatial @ www.destinationspatial.org | A Life Without Limits @ www.alifewithoutlimits.com.au | Spatial Industries Business Association @ www.spatialbusiness.org | Surveying and Spatial Science Institute (SSSI) @ www.sssi.org.au

When you become a Surveyor, it will be essential to belong to a professional organisation, such as the Spatial Industries Business Association, The Royal Institution of Chartered Surveyors, The Country Surveyors Association, Australian Institute of Mine Surveyors, Association of Consulting Surveyors (NSW & Victoria), or any of the other professional organisations, because they can offer you lots of advice and help if you need it and help you to grow and advance in your career.

Then how do you become one?

You can gain surveying skills through a university or TAFE, whether this be on-campus, via e-learning or distance education. Depending which course you choose, study may last up to 4 years. After you have completed your course, you work as an assistant to a Registered or Licensed Surveyor (the title depends on which state you're in) for one to two years before becoming qualified yourself.

Some of the different courses you can look into include Certificates II and III in Surveying and Surveying and Information Services; Certificate IV in Surveying; Spatial Data Collection and Surveying; Bachelor of Surveying and Spatial Sciences; and Graduate Diploma in Surveying. A great place to start investigating these options and more information is the Destination Spatial web site.

There are different surveying disciplines, for example **Engineering Surveyor** - setting out roads and infrastructure projects, **Geodetic Surveyor** - taking precise measurements over large distances and undertaking complex calculations on the shape of the earth, even using satellites for earthquake prediction and more, **Cadastral Surveyor** - measuring and establishing legal property boundaries enforceable by law, **Mining Surveyor** and several other disciplines. Many rural Surveyors also do town planning and prepare statements detailing the environmental effects of a development. Make sure you investigate all the options because knowing your area of interest can help you choose your study direction.

What skills will you need? Over time, you'll need to gain good computer skills and skills in a relevant technical drawing software, such as AutoCAD Civil 3D, CivilCAD and others, plus the ability to use GPS instruments. You'll also need to develop high attention to detail, the ability to write up good reports and to communicate clearly and politely with other workers and clients, with people from the government, and with people living in the country.

How about personality traits? Eventually, you'll need to be able to work independently by yourself, have lots of initiative, be very observant and able to think clearly to solve problems. You'll also need to enjoy travelling in remote places, be good at working in teams, and be calm and patient. **Sounds a lot doesn't it** - but many of these skills will come with age and a love for your work.

FYI: When searching for surveying courses, also look under 'Spatial Science'





Town?
What
town?

Hey! Try looking
in a new
direction!

TIME FOR ACTION

Now you have a pretty good idea about what types of opportunities there are for surveyors in rural areas, perhaps you can start to do a bit of your own research and get a good overall 'birds eye view' of the possible towns and surveying disciplines you could work in.

Why not start with doing a bit of research to find out a bit more about the towns already mentioned in this book.

You could do an Internet search of the towns for starters.

Try search terms such as simply the name of the town and state or search terms such as 'surveying jobs in Charleville Qld', or 'cadastral surveyor Broome WA' or 'living in Mount Gambier SA', or 'things to do in Alice Springs NT'.

Then take it a step further. Either drag out a hard copy map or a map book, or Google 'maps of Australia' and investigate other towns.

See how much you can find out about each town where you might, someday, what to live and work.

Remember, it's when you and others move to live and work in these small country towns that these towns will grow and become better, more inspiring and fun places to be.

Don't complain — take control

So, you've been researching rural towns where you might like to live but it doesn't sound like there is that much to do. Well, when you live there YOU can change all that!!

If you love soccer but there's no team - start one! The chances are really high that if you love soccer there will be others in the district that love it too, and it doesn't have to be only in your own town. Country people are used to travelling long distances. You might have to negotiate a bit with the local council and footy club but it's all a part of creating a community everyone loves to live in.

If you love mountain biking or BMX racing - start a club! Maybe you could approach the council or a local land owner to see if a section of land can be set aside for creating a track.

What is YOUR special interest? What can you do to introduce that to a new community? **Don't forget!** Everyone is responsible for creating the best world, the best community and the best life they possibly can. It's not up to others - it's up to Y. O. U.

Enjoy!





Now you know a bit about being a Rural Surveyor. If you are interested in the outdoors, love variety, enjoy maths and working on computers, and are up for a bit of adventure, maybe this could be the job for you.



Over time web addresses, names of organisations, available options and other information may change. To be sure you have up to date information there is a web site resource you can access - **PLUS** - provide you with links to salary information, other career options and more.

Visit www.workingintheconomy.com.au and have a look around. You may even discover another rural job you might be interested in pursuing.

This is your one and only life. Make the most of it!

Careers in Series One:

Rural Surveyors

Rural Office Professionals - Secretary, Executive Assistant, Office Manager, more
Rural Wool Harvesters and Wool Processors - Shearer, Wool Classer, more
Rural Communications - Radio, TV, Newsprint, more
Rural Mechanics - Farming, Mines, Transport, Community
Rural Social and Mental Health Support
Rural Telecommunications
Rural Skin Care Professionals and Beauty Therapists
Rural Food Production Health and Productivity - Agronomist, Biosecurity, more
Rural Finance Professionals

Keep on the look out for more book series, each showcasing a diverse range of occupations and rural towns and districts!



Antique Surveying Scope

Photographs:

Cover Page: Surveying near Selwyn, Qld courtesy Dale Atkinson
Title Page: Waterways survey, SA courtesy John C Bested & Associates Pty Ltd
Copyright Page: Windmill, Roma credit Tourism and Events Queensland
Contents Page: Dale surveying near Quamby, North West Qld courtesy Dale Atkinson
Page 2: John Morgan Kimberley Survey courtesy Morgan Family
Page 2: John Morgan, Surveyor General of West Australia courtesy Land Surveyors Licensing Board of Western Australia
Page 2: Blazed trees from Burke and Wills Expedition courtesy Frank Leahy
Page 3: Bradshaw Bridge, Tasmania credit Tourism Tasmania | Joe Shemesh
Page 4: Surveying on 'Arkaba Station' SA courtesy John C Bested & Associates Pty Ltd
Page 4: Variety of Surveying Equipment courtesy C.R. Kennedy Survey Solutions
Pages 6&7: Courtesy Adam Nicholson
Page 8: Ord River Irrigation Scheme courtesy Survey Dynamics Pty Ltd
Pages 10&11: Courtesy Laura Bendsdorp
Page 12: Land sailing on Lake Lefroy, WA courtesy Rolsh Productions, WA
Page 12: Kambalda, WA courtesy Rolsh Productions, WA
Page 14: Lake Moondarra, Qld credit Tourism and Events Queensland
Page 15: Courtesy Dale Atkinson
Page 16: Mount Isa, Qld credit Tourism and Events Queensland
Page 16: Monument at Royal Flying Doctors Service Centre credit Tourism Queensland
Page 18: Post Office, Tamworth NSW credit Destination Tamworth
Pages 19&20: Courtesy Baxter Geo Consulting Pty Ltd
Page 22: Surveying Students courtesy The University of Newcastle, Australia, NSW
Page 23: Kookaburra sits in an old gum tree - Photo: Breanna Neil
Page 24: Background: Tamworth credit Destination Tamworth | Cricketers courtesy South Burnett Times | Footballer courtesy Dale Atkinson | Rodeo in the Country credit Tourism Queensland | Kayaking Murray River, Albury credit Destination NSW | Westwal Gallery, Tamworth credit Destination Tamworth | Mountain biking overlooking World Heritage rainforest of Myola near Kuranda credit Tourism and Events Queensland
Page 25: Courtesy KLM Spatial, www.klms.com.au

Marker indicating the exact meeting of the borders between the Northern Territory, South Australia and Western Australia, known as 'Surveyor General's Corner'. Rural Surveyors go everywhere!



You know, most of the jobs you do in the city you could also do in the country, plus a whole lot more!

It's true!

You don't always have to live in the city to enjoy the type of work or profession you've got your heart set on, and there can be some amazing side benefits when you live and work in the country.

**'Rural Surveyor' is the first book in the series -
'Working in the Country'.**

In the '*Working in the Country*' Rural Series, there are stacks of ideas and choices about the job opportunities available in rural and Outback Australia. Some may surprise you, or they might even inspire you to have a few fantastic ideas of your own!



ISBN

BAR CODE