

# CASE STUDY

## STANTHORPE - QLD, AUSTRALIA

### ADVANCED METHODS IN GROUNDWATER EXPLORATION LOCATING PREVIOUSLY UNDETECTED WATER SOURCES FOR DROUGHT PRONE REGIONS

Written and Compiled by the Lawrence Anthony Earth Organization Technical Staff

#### INTRODUCTION

Stanthorpe is a rural town in southern Queensland that found itself at the centre of the water crisis in late 2019. In January 2020 more than 5,000 residents were relying entirely on trucked water. The effort of trucking water the 130-kilometre round trip from Connolly Dam to meet the demands of the town is still costing the state \$800,000 a month as of June, 2020<sup>1</sup>.

The Granite Belt Growers Association (GBGA) ran a survey to gauge the financial impact of the drought, it indicated that the local region could suffer \$60 million less in economic activity and about a \$40 million reduction in wages in the 2019-20 financial year<sup>2</sup>.

#### ROSEMARY HILL ORCHARD

East of Stanthorpe lies Pikedale a rural locality consisting of stock, dryland and irrigated farming. Both Stanthorpe and Pikedale are located in the Granite Belt region, an area of the Great Dividing Range that gains its name from the predominantly granite rocks that distinguish it.

In 2019 stone fruit grower Angus Ferrier of Rosemary Hill Orchard, located in Pikedale, was caught in the current drought, with his dams drying up. His orchard stretches across 25 hectares and can house 30,000 fruit trees at capacity<sup>3</sup>.

During the previous drought (2013-2014) he had drilled 7 wells, with ultimately only one proving to be productive<sup>3</sup>.

Having no other options, he was going to have to resort to letting up to 30% of his trees perish due to lack of water, the long-term economic impacts of which could be devastating for a family owned operation.

Ferrier wanted a solution that, in combination with more sustainable water management practices, would make the property more drought resilient. He was connected with members of the GISA Company Group for assistance in locating groundwater on the property.



Figure 1. Storm King Dam near Stanthorpe

\*GISA Company Group founded by The Lawrence Anthony Earth Organization consists of entities operating in Australia, USA, Middle East and South Africa with a mission to implement effective water security solutions

## ROLE OF GIS ANALYTICS (GISA) COMPANY GROUP

GISA’s objective is to reduce the negative economic impacts of drought through mitigating the risks associated with groundwater exploration.

This is accomplished via specialized, proprietary techniques to detect previously unknown sources of groundwater. Through the identification and proper management of these resources, GISA strives to strengthen drought resilience in communities like Stanthorpe and for producers like Rosemary Hill.

### METHODS

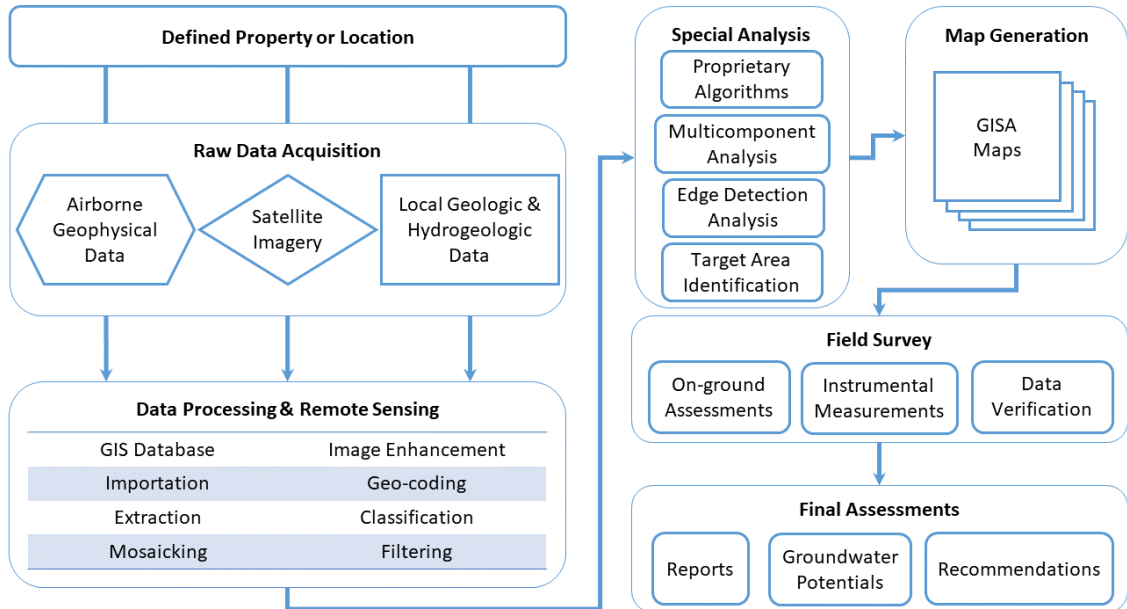
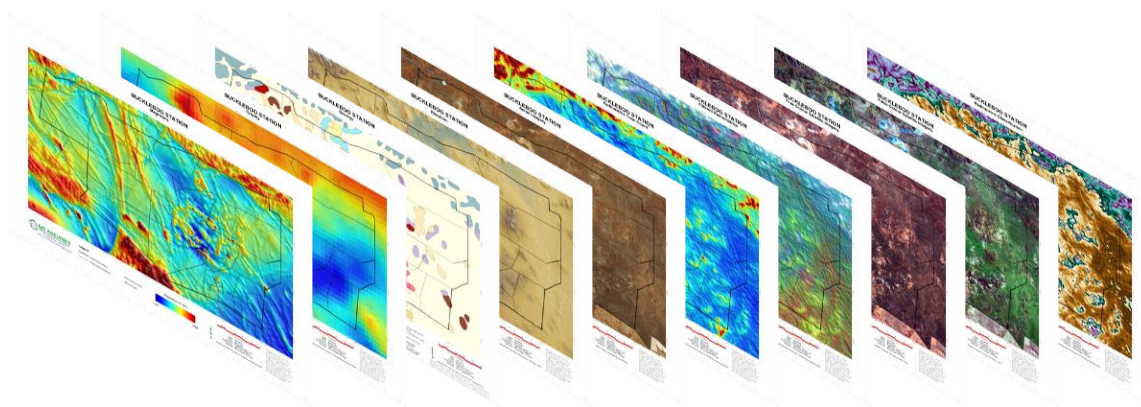


Figure 3. Specialized maps generated and analyzed for Buckleboo Property



### DRILLING RESULTS

Based on GISA’s analysis, the client pursued one of the two most highly recommended bore sites.

The chosen site is located near the existing dam and is intended to be utilized for irrigation on an as-needed basis, if the water quality is satisfactory.

The GISA Company Group’s technical experts recommended drilling to approximately 420 meters for the best results.



Figure 4. Drilling at Site 2 on 29 January 2020.

Due to the monetary constraints of deep drilling, a depth of 260 metres was targeted. Even this depth was twice as deep as the grower had ever drilled before.

The rock encountered was a basalt-granite combination, which required highly skilled drillers<sup>4</sup> to be successful.

Significant water bearing zones were found at approximately 80 and 240 metres.

The bore development process was extended by several complications, including those of the global pandemic, but in July 2020 the bore was fully completed and has yielded excellent results.

As of mid-July, 2020 the bore was producing 1 L/s\* (3,600 L/hour), with the potential of increase flows as the bore continues to develop<sup>3</sup>.

#### REFERENCES

1. Morris, Nathan. "Stanthorpe Runs out of Water, Requiring Trucks to Bring Supplies from Warwick." ABC News, ABC News, 13 Jan. 2020, [www.abc.net.au/news/2020-01-13/stanthorpe-water-runs-out-trucks-bring-in-loads-qld/11863432](http://www.abc.net.au/news/2020-01-13/stanthorpe-water-runs-out-trucks-bring-in-loads-qld/11863432).
2. Purcell, Matthew. "Granite Belt to Lose 900 Jobs by End of Summer." Stanthorpe Border Post, 3 Oct. 2019, [www.stanthorpeborderpost.com.au/news/granite-belt-to-lose-900-jobs-by-end-of-summer/3844825/](http://www.stanthorpeborderpost.com.au/news/granite-belt-to-lose-900-jobs-by-end-of-summer/3844825/).
3. Wilson, Courtney. "Digging Deep: New Approach to Find Underground Water." Landline, Australian Broadcasting Corporation, 18 July 2020, [www.abc.net.au/landline/digging-deep:-new-approach-to-find-underground/12470064?fbclid=IwAR3gu5hBCx0OwdhBHOj4nMhVfveILCORlFnFGHleMHij\\_YJHvva3r7K1dE&jwsourc=cl](http://www.abc.net.au/landline/digging-deep:-new-approach-to-find-underground/12470064?fbclid=IwAR3gu5hBCx0OwdhBHOj4nMhVfveILCORlFnFGHleMHij_YJHvva3r7K1dE&jwsourc=cl).
4. <http://www.asds.com.au/>

Final Depth	Current Flow-rate
250 metres*	3,600 L/hr*

\*Estimated values, awaiting final driller report.

*"As we stand here in mid-July, our orchard has not received nearly enough rain to break the drought... A litre per second is very valuable, we can do a lot with that, and plan to in the coming season. <sup>3</sup>"*  
 - Angus Ferrier, Grower



Figure 5. Water flowing from bore during drilling

For Further Visuals of Geo Spatial Analytics and Documentation see ABC Landline Documentary Interviews @ [DSW TECH](https://www.abc.net.au/landline)