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From the Committee



2020 was certainly a year of new business and lifestyle experiences and had an impact on our Association and the way we had to communicate with everyone. The NULCA Committee would love to hear your feedback in how you would like meetings to proceed going into 2021. The easy access of the online

meeting has allowed more people to attend but we have also felt there has been less interaction. In 2021, would you like to see a continuation of the online meetings, a move back to face to face destination meetings or a combination of the two? We also want to hear how we could better assist the members. Members will receive a survey via email in the coming month on locating issues and how

NULCA can improve, we ask for you to please be on the look out for this survey and encourage your participation. We look forward to hearing from you.

We cannot believe how quickly another year has past and would like to thank the outgoing Committee Member Rod Brumby and welcome the new additions of Darryl Critcher, Tony Alcock and Geoff Orchard. It is also time that we wish all Members a safe, happy holiday break and prosperous 2021.

Christmas offers from Suppliers

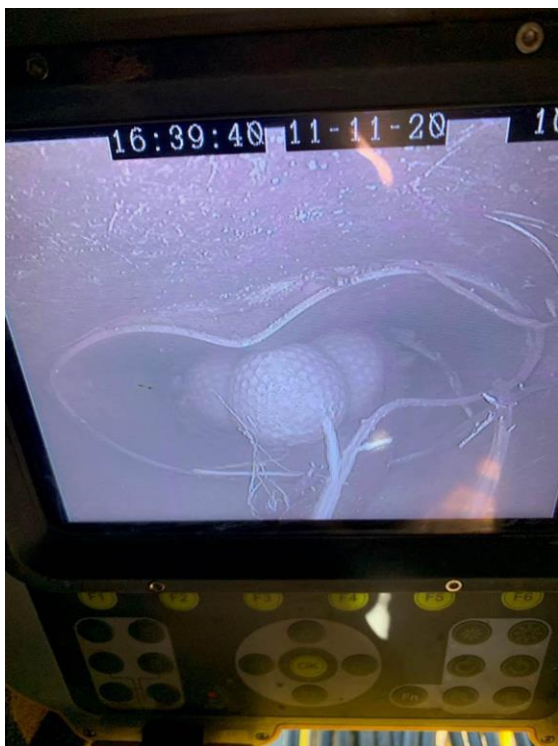
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RYCOM Clampmitter V1.0 40% off valid until 30th December 2020. Terms and Conditions apply, see advert at end of Newsletter.



Christmas ideas for the Golfer?



CCTV Inspections always come in handy with stormwater blockages. This is a recent job submitted by Leaktech where you can see golf balls as the culprit.

Conference Updates

Locate 2021 – 30th March to 1st April in Brisbane. This is a geospatial conference

AUSJET – 3rd to 4th March 2021 in Melbourne. This is a water jet and vacuum conference.

No Dig 2021 – 5th to 8th October in Sydney. This has a NULCA Locating specific and Trenchless Technologies stream.

AS5488 – Australian Standards Committee reconvening

Australian Standards Committee has commenced meeting to consider a proposed wording change to reflect 2020 Surveying Grid. Our President has representation on this committee and will keep us informed should there be any changes.

2021 General Meetings

In our recent Committee Meeting it was decided that we would hold General Meetings quarterly so that we can dedicate more time in getting guest speakers to present informative content. General Meetings have been scheduled for:

January 2021

April 2021

July 2021

October 2021

Next Virtual General Meeting –

Tuesday 19th January 2021

5pm AEST, 6pm ADST

Multi Array GPR

THE RIGHT WAY TO USE MULTI ARRAY GROUND PENETRATING RADAR (GPR) FOR UTILITY MAPPING.

Multi Array GPR seems to be the buzz at the moment. You have some great manufacturers pushing some great systems, but with this has come a lot of misinformation to potential customers on how to use Multi Array GPR systems correctly.

Raptor 45 Vehicle System



Multi Array GPR's do not replace conventional locating techniques. If a salesperson tells you no longer require traditional EMF locating techniques and that Multi array replaces most of EMF locating requirements, then walk away because you may spend a lot of money and find yourself in some deep water when it comes to kind of results you wish to get from multi array GPR systems.

Although Multi array GPR systems are better than single or dual channel/dual frequency which are much more common in the utility detection industry, they still have the same issues that these smaller systems have and still require a professional locator contractor to go out onsite to locate and better identify services.

First, let us look at the Australian Standards. The AS5488-2019 which is the updated Australian Standard for Subsurface Utility Information (SUI) for utility mapping. There

have been some small changes that now allow inclusion of GPR as a means to improve on our Quality Level C (QLC). We call this a QLC assist. This allows the use of GPR to improve our QLC results. So instead of having to draw straight lines between points we can use GPR to better assist with bends, changes in direction and give an operator a better result when applying data to a finished project. Most data we receive from GPR whether it be single, dual or multi array antennas are normally still classed as Quality Level D (QLD) unknowns.

It would be dangerous to tell your client that this is a power cable, this is a water pipe through the use of Multi Array GPR data without further investigating and physically connecting to a service to formally identify and bring your result to a QLB. This will save your clients thousands in incorrect identification of services.

Other issues that have plagued any GPR system single, Dual or Multi array are soil types. I have seen the most expensive arrays miss services literally only metres deep. It can be quite embarrassing for you when you client damages a water main due to poor soil types after using GPR alone when a simple EMF locator could have identified it easily and improved results for your project.

Another area that is brushed over with these systems is post processing. To be done correctly you need to have good software that is both fast and allows the operator to see and improve/confirm data quickly. Remember these new systems collect a lot of data that needs to be carefully examined by trained staff to get the best and most accurate results. There is no such thing as automatic detection of services and operators need to see data to make an informed decision when post processing.

So now that I have painted a picture that may look like I am not recommending Multi Arrays for utility detection, I will now discuss why multi array GPR can be an invaluable tool to enhance results when surveying a site especially when used in the right part of a project.

Ideally good planning for any project is the key to good results. Good data in, means good data out for your client. There are two scenarios when using Multi Array GPR.

The first and most ideal method is to locate services using conventional EMF technology and other technologies. By doing this you will get more accurate results, you have a good overview of the project because you are walking the sight and using visual means to confirm. You are able to identify the services you hook up to the difference between a power cable and a telecommunications line for example. Of course, having an experienced locator is critical to this as you can still get poor results if the operator does not understand the technology, they are utilising. This can also be the same when using conventional GPR.

Raptor 80 Cart



Once the Locator has located the services with traditional methods, we then utilise our multi array GPR system to do two things.

1. Confirm what we have already found using our EMF locator and other technologies. This is a great confidence boost when both EMF and GPR work together to find the same service.
2. Find any unknowns that EMF technology may not be able to locate. This is a great method for Multi Array systems as you can now add the data you have already collected from EMF and Multi Array to complete the project with a higher confidence level.

The second method is a method you would use when you want a quick overview of potential services on a project before commencing any further works. By running a Multi array system first. Clients can get a good overview of the project and what potential services might be along the project path. This is a less accurate way of confirming services but is still a great method as an overview. It is then advised that further investigation in the field to confirm what radar has picked up.

Post processing is an important part to both above methods and as I mentioned before an experienced operator is needed to get the most accurate results. Incorrect processing can cause depths to be incorrect especially if soil types and soil conductivity changes from section to section along a project.

Now all the client has to do is identify the areas of concern by pot holing to bring to project to the higher QLA.

Side Note: I almost forgot to mention the importance of accurate GPS positioning. This is a critical part to using Multi Array GPR. I would suggest using high-end GPR technology that is good at tracking position at speed. Not all GPS systems are good when moving fast.

Remember you can reach speeds of up to 130km

A final warning: Just because you have used both methods to detect services do not forget there may still be unknowns that you have not found. Shallow services that are non-metallic maybe missed by some of the frequency ranges used in common Multi array GPR systems and may not be detectable by conventional EMF.

A good example of this and something that has haunted many road profiler operators and contract locators are small gas lines, some of which are within 100 - 200 mm from the surface. These shallow services have been missed on many occasions causing a lot of damage to the profiler. Even the most expensive Multi arrays may not detect these due to the frequency range they use. Specialised systems may have to be bought into assist. A high frequency multi array GPR using 800 MHZ or above units have a much higher chance of detecting these smaller services along with road layers.

I hope this clears up some of the information to make an informed decision when purchasing or utilising a Multi Array GPR system for utility detection.

Article by Anthony Johnstone Access Detection. www.accessdetection.com.au

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