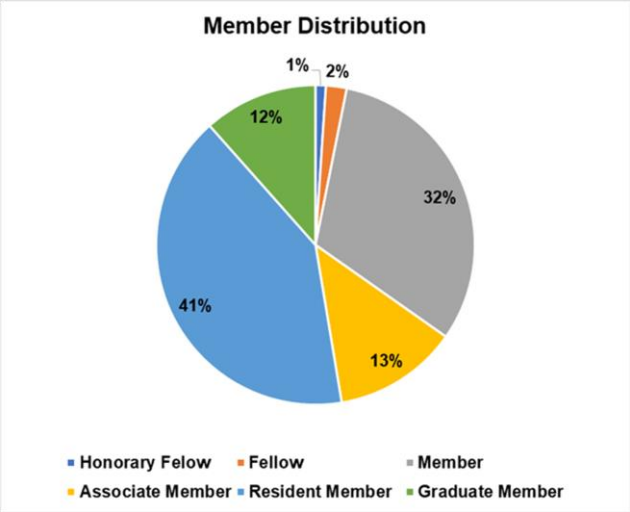
IESL QLD CHAPTER

VOLUME 09 ISSUE 01

Subcommittee Reports

Membership Subcommittee



The chart above reflects our current Chapter membership distribution. As of the end of April 2024 -we have a total membership strength of 95 distributed across the different membership categories, as shown.

As we step into the second quarter of 2024, aiding our members in securing fulfilling employment within a dynamic economic landscape stands as a primary goal for our Chapter. To this end, in addition to the formalized Mutual Recognition Agreement (MRA) between Engineers Australia (EA) and the Institute of Engineers Sri Lanka (IESL) (which is now available on the chapter's website), we have also imitated the Recent Migrant Engineers Support Programme (REMSP).

The REMSP program allows the recent migrant engineers to be mentored by experts in the field and will aid in their career development and networking. Applicants can reach out to us through secretary@ieslqld.org to get connected.

Our focus continued to guide engineers toward their appropriate membership category and facilitate the most fitting pathway to achieve their desired outcomes. This tailored approach aims to ensure that each member's journey aligns seamlessly with their ambitions and professional aspirations.

A Membership Eligibility Check Flow Chart – has been initiated to simplify the process of self-checking /screening for new applicants. This Chart is now available on the Chapter website.

The Chapter membership database is currently being further classified by Eng. Discipline/Qld region/ industry/expertise to generate profiles that will assist in the better planning of targeted services to the membership.

Our invitation remains open for more graduates and senior members to join and work with us to fulfil their engineering career aspirations by participating in various CPD events, contributing to newsletters, and availing of networking opportunities available.

Please contact us through info@ieslqld.org if you are interested in joining and engaging with Chapter activity.

Eng. Arthur De Alwis

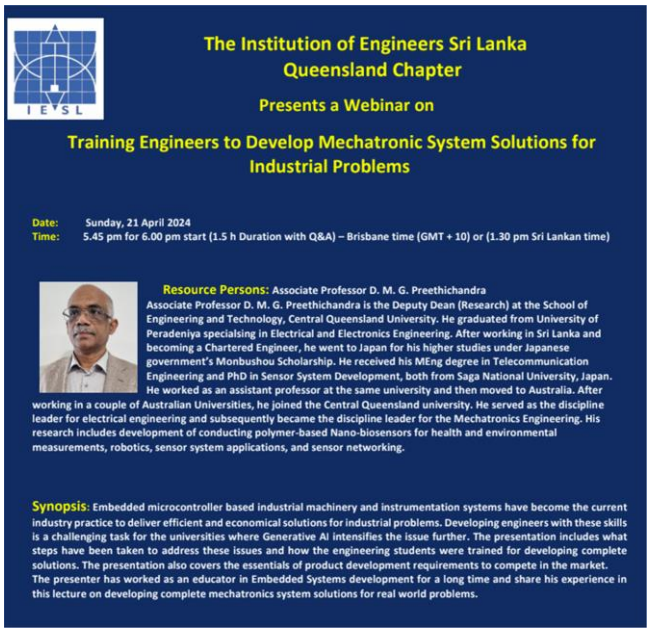
Chair – Membership Subcommittee

Technical Subcommittee

Technical subcommittee is proud to announce that the "***The Professional Engineer of the Year***" award preparations are currently underway. The event will take place on the 18th of July 2024 at Engineers Australia Auditorium Brisbane. The event aims to promote professional contribution, and the Chapter wishes to acknowledge their valuable socio-economic contribution.

IESL QLD chapter initiated an approach for "Collaborative Initiatives for a Resilient Future: The Role of Overseas Chapters" featuring the distinguished President of the Institute of Engineers Sri Lanka (IESL), Prof. Ranjith Dissanayake on 27th January 2024.

A CPD event on training engineers to develop mechatronic system solutions for industrial problems was organised on the 21st of April 2024. The CPD was conducted by Associate Professor D.M.G. Preethichandra from Central Queensland University. This CPD attracted both Australian and Sri Lankan academics, industry, and students.



We have planned a joint CPD event with Ruhuna chapter in Sri Lanka. We are also working with Engineers Australia for a joint CPD. There will also be a field trip depending on the availability in 2024.

Please stay tuned for updates through our communication channels.

Dr. Abdul Ziyath

Chair – Technical Subcommittee

ICT Subcommittee

ICT team is at the forefront of delivering the underlying ICT related services, ensuring successful cyber presence and communications of the Chapter events. The first quarter was a productive one for the ICT team. The routine business of the Chapter – including the remote and hybrid conduct of the monthly Management Committee Meetings were facilitated without interruptions.

Whilst ensuring business as usual objectives for the Chapter events, ICT team thrives forward to reach new horizons. Our new look state-of-the-art Chapter website is operational on an industry standard Content Management System (CMS). Website is continuously undergoing frequent updates to ensure reliable online presence. We acknowledge that the Chapter website is a living entity and constructive feedback from the readership is encouraged and thankfully accepted.

The new ICT subcommittee is thankful to the past subcommittee members for the great work and milestones achieved, especially with regards to the Chapter website. The new ICT subcommittee is aspiring to continue and enhance our achievements further.

In this year -we have planned to review our existing contracts with our ICT service providers to ensure that the service scopes and standards match our ongoing/changing demands to ensure that we obtain value for money.

Furthermore, as the ICT subcommittee members, we always strive to deliver enhanced and secure ICT services to the Chapter. We wish to march forward with similar objectives and principles for the rest of the quarters in 2024.

Eng. Lahiru Ratnayake

Chair – ICT Subcommittee

Editorial Board

Wrapping up another noteworthy edition of our IESL QLD Chapter newsletter, it's my pleasure to acknowledge those pivotal to the seamless compilation and timely release of our publication.

From the last successful publication, the Editorial Board has been deeply engaged in several pivotal initiatives:

-The successful compilation and publication of our May 2024 Newsletter stand as a testament to our team's steadfast commitment to the timely dissemination of relevant knowledge.

-A great deal of attention has been devoted to ensuring the proper archival of all past Newsletters on our website, preserving our shared history and insights for future reference.

-A 'Lessons Learnt' analysis of prior publications has been undertaken – and the Editorial board decided to issue the May 2024 newsletter in a new template, we anticipate our subscribers will welcome the new format.

Since the establishment of our Chapter, we have proudly issued seventeen Newsletters, maintaining an average release rate of three per year. The editorial board has chosen to produce three issues for 2024, maintaining the same rate, May 2024 issue is the first issue of 2024.

Let's take a moment to applaud our collective successes and anticipate more in the future. The strength of the IESL QLD Chapter newsletter mirrors the strength of all those contributing to its creation. Here's to our enduring commitment to delivering top-tier technical and engineering knowledge to our readers.

Beyond the Editorial Board, sincere appreciation extends to the ICT committee, whose efforts were paramount to update the newsletter archive on the website.

Access the past Newsletters of the Chapter via the following link: Qld Chapter Past Newsletters

Eng. Gihan D Vitharanage
Editor & Chair - Editorial Board

Social Subcommittee

The Social Subcommittee is delighted to announce two upcoming events for the 2023/24 year, designed to enhance community engagement and provide enjoyable experiences for our members.

We are excited to unveil our first event—an enriching family trip to a popular destination near Brisbane. Your participation, along with your family, is highly encouraged. While the date is pending confirmation, we are committed to keeping you well-informed as details unfold.

Our second planned event is a unique movie night, which also serves as a fundraising initiative. We are currently in discussions with renowned film directors in Sri Lanka to present a captivating family movie experience. Regular updates will be shared as the SSC works diligently to ensure the success of this cinematic event.

In addition, the SSC is proud to announce that IESL QLD Chapter is launching ***Sri Lankan Migrant Engineers Support Program***. This provides support and networking opportunities to engineering professionals who obtained their qualifications in Sri Lanka and migrated to QLD in recent years. Also, this is a mentoring program to support recent migrant engineers entering the Australian Engineering industry.

Please use the link below for more details and for the registration process. https://www.ieslqld.org/support-program/

IESL QLD Chapter conducts this program as an obligation-free guidance/advice program.

We invite you to participate enthusiastically in these upcoming events, contributing to the creation of enduring memories and the reinforcement of our community bonds.

With anticipation and warm regards,

Eng. Jayantha Wickramatunga

Chair – Social Sub Committee

Pathway Towards the Net Zero Target 2050 Resetting the QLD Resources Sector

Australia's greenhouse gas emission reduction targets were legislated in 2022 with a plan to reach Net Zero by 2050. Along with other Australian states Qld has subscribed to the fed govt commitment to this NetZero target.

Traditionally the resources sector has been a pillar of the economy of Qld contributing above 13% of the state's revenue. In 2022-2023 this figure has risen to 18% on account of the lavish coal royalties that have contributed to the govt coffers and the state budget bottom line.

With the universal dawning of climate change realities, a growing emphasis on emissions reduction has been imposed on the Qld mining sector from the 1990's up to now. Operating ventures have been directed to reduce emissions on specified stringent timelines or run the risk of losing their operating licenses. Proposed new ventures have been subjected to stringent environmental compliance standards before design approval construction and operations.

In partnership with the federal govt the Qld state govt has ventured out to turn this challenge into an opportunity and change the direction of Qld mining with a new start in the mining and processing of the hitherto untapped critical minerals that are abundant in the northwest mineral province of QLD.

This initiative will also pave the way for new local industries to be established in regional Qld that will form the supply chain required for the ambitious renewable energy transition that is now underway at an accelerated pace.

A firm commitment has been made in the federal budget just presented in May 2024 by allocating $14bn as a subsidy to provide impetus to this unprecedented Made in Australia initiative.

This article discusses this new direction of the QLD resources sector and the opportunities it is likely to offer newly migrant and experienced engineers to secure jobs in the design construction and operational phases of these new ventures and settle into a desirable lifestyle in regional QLD.

(Continue reading the full article in page 11)

The Management Committee

All that Glitters
History and Revival of Mt. Morgan Gold Mine

Gold mining played a significant role in the upliftment and resilience of early Australian economy. Due to global market issues, certain inefficiencies and limitations in the extraction process technology and economy along with the extent of the ore and distribution a large number of the mines have been abandoned during the late 1900s

These abandoned sites have led to ghost towns being created due to greater dependency of local economy on mining. They also present an adverse environmental legacy resulting from the generation of acidic runoff and heavy metal contamination.

Mt Morgan mine in Central Qld is such a mine that ceased its operations in 1980. During its prime, Mt Morgan mine was the largest gold mine in the world. In 1993 the environmental liability was accepted by the Queensland Department of Natural Resources and Mines.

A few companies have attempted to revitalise the mine with initial progressive claims. These attempts were short lived due to either financial issues, regulatory constraints, or process technology issues. The latest prospectors Heritage Minerals Pty Ltd in collaboration with Green Gold has successfully passed through the initial hurdles (i.e., securing finance, feasibility studies, and environmental approvals) and has demonstrated capability to reinstate tailings treatment, precious metal recovery and environmental conservation. Initial operations are to commence in mid-2024.

(Continue reading the full article on page 14)

Presented by: Dr Subhash Hathurusingha

Author Biography: Dr Subhash Hathurusingha is a Chemical Engineer who has subject matter expertise in renewable fuel and solid waste and recycling infrastructure. He has over 15 years of experience in both Academia and in waste industry. He is a member of Public Works Engineers Australia and Waste Management Association of Australia. He is also a reviewer of elite academic journals such as Biomass and Bioenergy, Bioresource Technology, Fuel, Chemical Letters, Renewable Energy, and Industrial Crops.

The Editorial Remark

In the challenging socio-economic landscape, Queensland remains a stronghold of innovation and resilience. With a steady commitment to engineering solutions, the state is steering through challenges with a visionary investment strategy. As we navigate through a challenging year amidst ~~of~~ growing inflation, housing crisis and geopolitical uncertainty, Queensland emerges as a beacon of growth, seizing opportunities amid adversities.

Federal budget 2024 revolves around the centrepiece, “Future Made in Australia” providing a boost to the Queensland long commitment toward net zero transition, innovations, and national economy through the four-year capital program “The Big Build”. This collaborative approach from both federal and state governments with added funding to accelerate investment on critical minerals, housing, infrastructure, and energy transitions aim to strengthen Queensland resilience, support growth, and enhance liveability while fostering innovation and sustainability. Engineering professionals will have a pivotal role in delivering these transformative changes.

Queensland's pledge to deliver carbon-positive Olympic venues sets an impressive tone for sustainability in engineering. This, coupled with the state's broader economic trajectory, paints a picture of resilience and foresight. The economic strategy extends beyond industry growth, focusing on inclusivity and creating a diverse workforce, aligning with the state's philosophy.

Engineers are crucial to the successful implementation of these projects, and it provides an increase demand for skilled professionals.

We applaud the IESLQLD 2023/24 management committee’s achievements to date by way of staging events to suit the needs of the QLD engineering community for continuous professional development opportunities, networking events and community engagement through entertainment events during the first half of the year. Most notable endeavours are “Professional Engineer of the Year- 2024” program and the “Recent Migrant Engineer Support” program to enhance the visibility and recognition of outstanding veteran engineers, as well as mentoring recently migrated engineers.

Our newsletter encapsulates a wealth of insights and updates vital to Queensland's engineering community. Engaging with the Chapter and contributing to the newsletter not only keeps members abreast of industry trends and opportunities but also provides a platform for networking and knowledge exchange. As we navigate the complex terrain of the engineering landscape, joining the Chapter promises an array of benefits, from professional growth to exclusive access to events and resources tailored to your career journey. The strength of our community lies in your active participation, ensuring a thriving and supportive ecosystem for Queensland's engineering professionals.

In these transformative times, the state's strategic investments in ambitious targets, sustainability, and workforce development pave the way for a robust economic future. As we stand on the precincts of progress, Queensland's engineering community plays a pivotal role in shaping a sustainable, inclusive, and prosperous tomorrow.

Eng. Gihan Vitharanage

Editor

Web Links and Feedback

Web Links

IESL Qld Website

http://www.ieslqld.org/

IESL Website

http://www.iesl.lk/

IESL Qld LinkedIn Page

https://www.linkedin.com/company/ieslqld/

IESL Qld Facebook Page

https://www.facebook.com/IESLQLD/

Feedback

The success of this Newsletter is very much dependent upon how well it is received by the wider audience as a timely publication carrying information of relevance and value. To this end we would highly appreciate if you could spare a few minutes to provide your feedback to us via the survey form below

IESL Feedback Form

Pathway Toward the Net Zero Target by 2050 Resetting the QLD Resource Sector (Continued from page 07)

The Coal Realities

It is no secret that Qld is a state heavily reliant on its abundance of both thermal and coking coal for significant export earnings and that the coal mining industry is strongly intertwined with the life of many regional Qld dwellers -especially in the Bowen Basin.

With the decarbonization targets imposed by the transition to renewables the coal industry has come under threat with the out phasing of coal power and green mining initiatives now on the cards.

However, the broader socio-economic impact of the transition from coal à to renewables is not a subject of simple discussion with job losses/ retraining of the work force/ compensation coming into the mix with multiple stakeholders. It's also at the centre stage of state politics.

Light Metals

Aluminium/Zinc/Copper/Magnesium/Nickel mining and processing are the top-ranking industries of Qld in the sphere of light metals extraction.

The major Qld regions engaged with the processing and export of these minerals are Mount Isa/Townsville/Gladstone/Rockhampton

The majority of these ventures have been established in the early or latter parts of the 20th century and been operating through boom & bust periods in world economy generating significant export revenue for Australia.

These ventures have also felt the impact on their operations from the current energy transition programs mainly on account of their traditional reliance on coal power. Many of these operations have invested/started investing heavily in projects to transition to renewable energy viz. solar/hydrogen/wind power -subscribing to the government's NetZero commitments.

Natural Gas [LNG]

Although recording a presence in moderate volumes in other states of Australia [SA/NSW/WA] this industry has shot itself into prominence in Qld from 2010 with the massive ventures to extract coal seam gas from the abundant CSG reserves in SEQ.

Three large scale LNG Liquefaction Plants have been built in Gladstone in the period 2010 to 2020 bringing Australia to the ranks of the topmost exporter of LNG to Southeast Asia. Belonging to the multinationals QGC/Sinopec/Santos these plants are supplied with CSG from the Surat Basin via cross country pipelines.

However, with the national energy policy of Australia undergoing significant changes in the light of the advent of renewable energy and NetZero subscription – LNG is now viewed as a player in the interim phase of the transition. Therefore, the approval of new LNG ventures has slowed down and the enthusiasm among investors has waned to some extent.

Critical Minerals

The policies of vigorous transition to renewable energy worldwide have brought into the limelight the significant role these critical minerals would play in the establishment of new industries in the supply chain for solar and wind power generation.

Hitherto unexploited significant deposits of these critical minerals [lithium/vanadium/cobalt/….] are abundant in the belt in north/central Qld extending from Tenant Creek àMt Isa àto Townsville now designated as the Northwest Mineral Province

The state and federal govts have now brought the attraction of investors to this region to the top of the agenda in NetZero activity -as the new direction of mining for QLD.

Green Hydrogen

Propositions for this new technology are also gathering momentum as a viable and economical alternative for fossil fuels.

Currently pioneered by West Australian mining giants – this technology is considered complementary to solar energy in that it will offer storage solutions and even export potential for solar energy.

Some of the multinational mining companies currently operating in Qld have already subscribed to a phased transition from coal à to green hydrogen for some of their ventures.

A Green Hydrogen Electrode Manufacturing Plant has commenced production in Gladstone [Central Qld] this month [April 2024] indicating that the Hydrogen Hub will also be operational soon.

The Management Committee

This article has been compiled with the generous support of some of our members who have worked in some of these industries in regional Queensland and involved in the management of energy transition/environmental compliance/emissions regulation/license critical projects. All attempts have been made to ensure that this insight is a factual representation of developments in reference to authentic current resources. Comments /corrections from own experience/suggestions are welcome from the readership with an invitation to contribute with further articles on this theme in the future.

All that Glitters
History and Revival of Mt. Morgan Gold Mine
Central Queensland (Continued from page 08)

Background to Gold Mining in Australia

All of us who are enjoying the modern-day luxuries here in Australia must be grateful to those who discovered Gold and those who pioneered extractive industries. Edward Hargraves's discovery of gold on the fields of Ophir in 1851, marked an important phase in Australian economic development. Gold mining industry brought unprecedented wealth to the colony's shores, and reshaped consumption, production, and the political and social landscape [1]

The first gold rush in Queensland conceived at Canoona near Rockhampton in 1858 which was short lived as the deposit was relatively small. The discovery of gold at Gympie in 1867 shielded Queensland from the adverse effects of the 1866 economic depression and boosted the state's economy during the first 50 years [2]. Exploration continued and discoveries were made at Charters Towers in 1872 and a new rush emerged at the Palmer River region in 1873, after the discovery of alluvial gold there by James Mulligan [2]. Currently there are 127 Gold mines in Australia and the largest one Boddington mine produced 785.33 thousand ounces of gold in 2022 [3].

History of the Mt Morgan Mine

In 1855 stockman named William Mackinlay, discovered that Ironstone Mountain approximately 8km south of Razorback Range, was auriferous (gold bearing) [4]. In 1882, a syndicate was created to open a gold mine at Ironstone Mountain. William Knox Darcy (later instrumental in establishing the Anglo Persian Oil Company), Walter Russell Hall (later influential in establishing the Walter and Eliza Hall Institute of Medical Research), Thomas Skarratt Hall, and Thomas, Frederick and Edwin Morgan formed the syndicate the property was renamed to Mount Morgan [5].

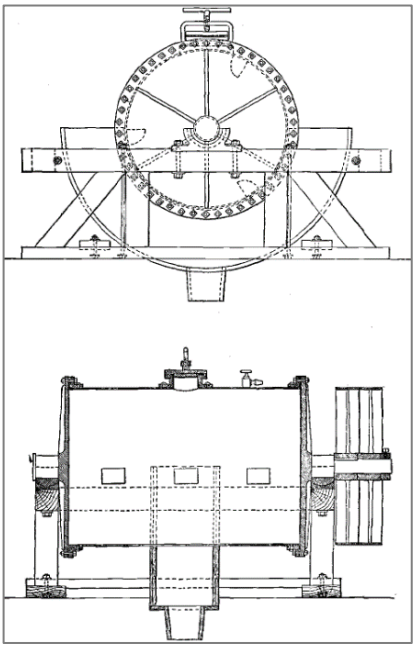


Fig 1: Barrel Process

Mining works commenced in 1883 by constructing 3 small dams. By 1886, Morgan's brothers sold their shares and a company named Mount Morgan Gold Mining Company Ltd was formed which managed the site from 1886 to 1927 [4]. During this period Mt. Morgan converted to an underground copper and gold mine. In 1935 it transitioned back to open-cut and continued until the mine closed in 1980 [5].

From 1982 until 1991, Peko Wallsend Limited undertook a tailings treatment operations recovering gold from 27Mt of tailings [5]. The first process technology to separate gold from the ore was Chlorination under high pressure and the company built the largest plant in the world at Mount Morgan. In the oxidised zone, amalgamation recovered only about 40 per cent of the gold [6].

Then Platter process[1] was introduced which recovered about 75% of the gold [7]. In 1887 the patented modified barrel process developed by Prof. J. Cosmo Newbery and Mr. C. J. T. Vautin which produced high yield (95%) [8]. Newbery-Vautin plant did not meet the capacity requirement and as a result an improved and enhanced (1500 tonnes per week) plants were installed with 95% recovery rate [6].

Cyanide leaching process was introduced in 1939 when an Oxide mill and Cyanide plant was built [4]. This technology was utilised with progressive improvements to extract both Copper and Gold until the open cut mine was closed in 1980. In 1982, CIP Cyanide plant was installed to treat tailings. The Mount Morgan mining operations were ceased in 1990. During its 108-year lifespan, Mount Morgan mine produced approximately 387,000 tonnes of copper, 262 tonnes of gold and 37 tonnes of silver [4].

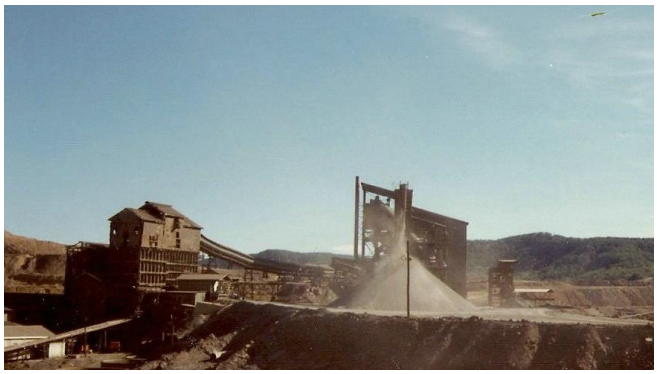


Fig 2: Milling Process 1950

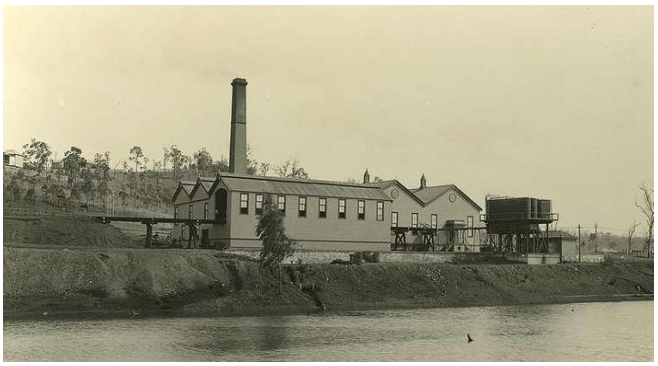


Fig 3: Cyanide Leaching Plant 1950

Environmental Issues of Abandoned Mount Morgan Mine

The pyrite remaining in the mine and tailings dumps is acid-forming which leads to low pH run-off into natural waters. This has created a significant environmental legacy. This legacy has become the responsibility of the State of Queensland (1993) and is currently managed by the Department of Natural Resources and Mining's (DNRM) Abandoned Mines Division [9].

Revival of Mount Morgan Mine

Since Peko Wallsend stopped operations in the early 1990s, six companies have attempted to reinstate operations at Mount Morgan mine due to high yellow metal prices and availability of efficient processing options for the refractory ore [9].

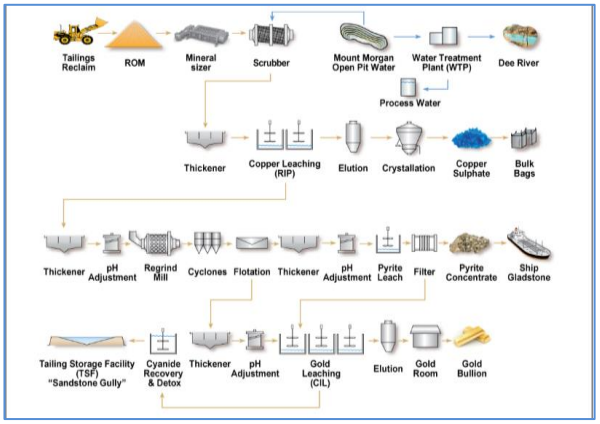


Fig 4: Calibre Process Flowsheet

In 2017, ASX-listed Carbine Resources developed a process flowsheet (Fig 4) to partially remove the troublesome Copper by acid leaching the tailings and produce Copper Sulphate. They anticipated that additional revenue from pyrite concentrate would supplement gold sales [9]. However, Carbine has withdrawn its interest due to higher than anticipated costs related to high cyanide consumption and lower by-products credits.

In 2019, following Calibre's exit Heritage Minerals Pty Ltd in collaboration with GreenGold took over the project rights. GreenGold brings ReCYN resin-based technology (Fig 5) that has demonstrated capability of reducing cyanide consumption by up to 50% through capturing free cyanide from plant tailings and recycling it back into the leach circuit [9].

The new integrated process can also detoxify the tailings stream and decontaminate water discharge at Mount Morgan. This would be a great assistance to DNRM, which currently treats acidic wastewater from the open pit and tailings deposits before being released into the local waterway.

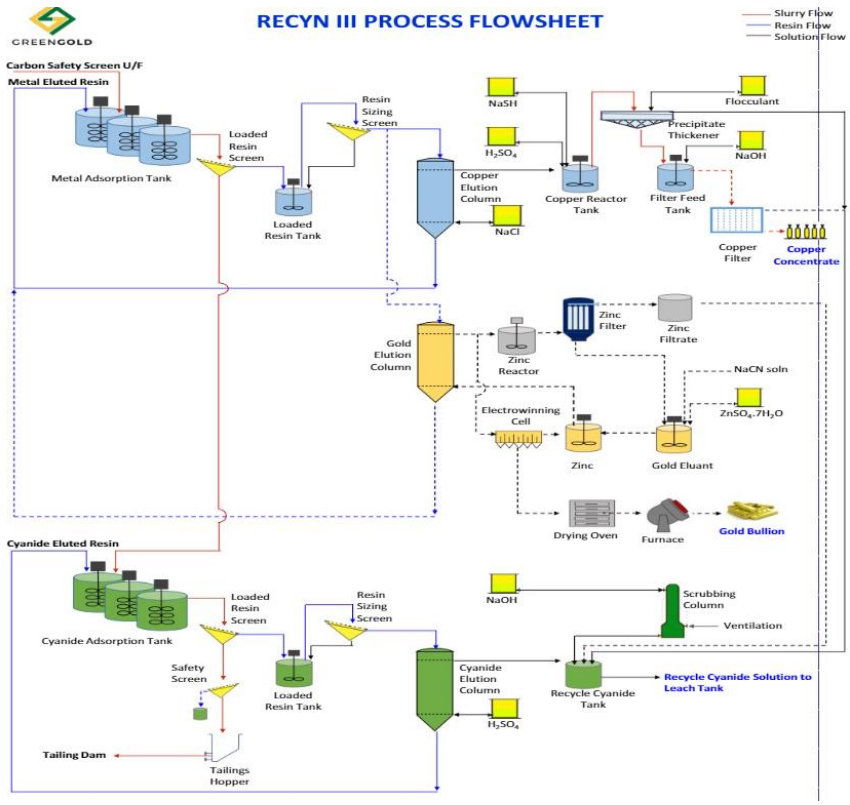


Fig 5: ReCYN III Process Flowsheet [10]

The company plans to establish a 2 MTPA plant over six years with a 13-year sequential expansion, with development cost of $157 million and annual production of 60,000 ounces of gold, and additional 5,000 tonnes of copper [11]. An independent economic analysis has shown the full-scale extractive and remediation project will provide significant benefits worth $849 million to northern Australia. Based on the company's demonstrated capability and the outcomes of the feasibility reports and pilot studies Northern Australian Infrastructure Facility has offered $66 million loan to Heritage Minerals Pty Ltd to carry out 5-year project which treats and recovers Gold from tailings at Mt Morgan mine [12]. Heritage Minerals Pty Ltd. Is currently planning to commence initial works in 2024 with great promise to support local economy, creation of jobs, improve environmental quality of the locality and prevents any indirect impacts on the Great Barrier Reef. Based on the success of this project the learnings can be applied to other abandoned precious metal mines in Australia.

Dr. Subash Hathurusingha

[Source references are available with the author for those who have further interest]