

From: [Trevitt, Hayley Mrs](#)
To: s47E(d) s47E(d)
Cc: s47E(d) [ODIS Business Coord](#)
Subject: FW: Correspondence Regarding NQ Spark – Request for Meeting between 1 Sept - 6 Sept [SEC=OFFICIAL]
Date: Thursday, 21 August 2025 11:35:53 AM
Attachments: [North Queensland Simulation Park \(NQ Spark\) Cover Letter Deputy Secretary Strategy, Policy & Industry.pdf](#)
[NQ Spark Project Overview.pdf](#)

OFFICIAL

s47E(d)

Can you please engage with the QLD DIAs to seek their views and knowledge on the below and attached.

s22

A response back to me via email is sufficient.

Regards,

Hayley Trevitt

Assistant Secretary
Office of Defence Industry Support (ODIS)

T: s47E(d) | M: s22 | E: s47E(d) [@defence.gov.au](mailto:s47E(d)@defence.gov.au)

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From: Pettitt, Liane MS s47E(d) [@defence.gov.au](mailto:s47E(d)@defence.gov.au)>
Sent: Thursday, 21 August 2025 7:17 AM
To: Howell, Michael MR s47E(d) [@defence.gov.au](mailto:s47E(d)@defence.gov.au)>; Trevitt, Hayley Mrs s47E(d) [@defence.gov.au](mailto:s47E(d)@defence.gov.au)>
Cc: CASG FAS Industry Engagement Coordination s47E(d) [@defence.gov.au](mailto:s47E(d)@defence.gov.au)>
Subject: Fwd: Correspondence Regarding NQ Spark – Request for Meeting between 1 Sept - 6 Sept [SEC=OFFICIAL]

Good morning, did you have a view about whether we can contribute and or lead

Kind regards liane
s22

Begin forwarded message:

From: "Nockels, David MR" s47E(d) [@defence.gov.au](mailto:s47E(d)@defence.gov.au)>
Date: 20 August 2025 at 6:37:22 pm AEST
To: "Passmore, Hugh MR" s47E(d) [@defence.gov.au](mailto:s47E(d)@defence.gov.au)>, "Wright, Kylie MRS" s47E(d) [@defence.gov.au](mailto:s47E(d)@defence.gov.au)>, "Pettitt, Liane MS" s47E(d) [@defence.gov.au](mailto:s47E(d)@defence.gov.au)> 4
Cc: s47E(d) [@defence.gov.au](mailto:s47E(d)@defence.gov.au)>, s47E(d) [@defence.gov.au](mailto:s47E(d)@defence.gov.au)>, s47E(d) [@defence.gov.au](mailto:s47E(d)@defence.gov.au)>, "fasdtric.office" s47E(d) [@defence.gov.au](mailto:s47E(d)@defence.gov.au)> 7
Subject: RE: Correspondence Regarding NQ Spark – Request for Meeting between 1 Sept - 6 Sept [SEC=OFFICIAL]

OFFICIAL
Hugh,

Ok with that approach.

I've also copied Liane onto the email – she may have some views on who in CASG may be appropriate to engage with as well.

Rgds,

David Nockels

First Assistant Secretary Defence Trade, Regulation and Industrial Collaboration

Strategy, Policy and Industry Group | Department of Defence
Russell Offices – s47E(d) | Canberra ACT 2600 | Australia
PO Box 7902| Canberra BC ACT 2610| Australia
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From: Passmore, Hugh MR s47E(d) <s47E(d)@defence.gov.au>
Sent: Wednesday, 20 August 2025 3:13 PM
To: Wright, Kylie MRS s47E(d) <s47E(d)@defence.gov.au>; Nockels, David MR s47E(d) <s47E(d)@defence.gov.au>
Cc: s47E(d) <s47E(d)@defence.gov.au>; s47E(d) <s47E(d)@defence.gov.au>
Subject: FW: Correspondence Regarding NQ Spark – Request for Meeting between 1 Sept - 6 Sept [SEC=OFFICIAL]

OFFICIAL
Kylie, David

DEPSEC SP&I has received correspondence from s47F, and s47F, seeking a meeting to canvass Defence support for the North Queensland Simulation Park (NQ Spark) – see papers attached.

NQ Spark is a proposal for a simulation and research facility in Townsville designed to serve as a catalyst for Defence industry investment in Northern Australia. The proposal already has Commonwealth funding from DISR (\$32.2M awarded in 2022) s47C, s47E(d)

s47C, s47E(d)

Hugh P

From: s47F
s47F
Sent: Friday, 15 August 2025 9:26 AM
To: DEPSEC SP&I Office
s47F <s47F@defence.gov.au>; s47F <s47F@defence.gov.au>
Cc: s47F
s47F

s47F

Subject: Correspondence Regarding NQ Spark – Request for Meeting between 1 Sept - 6 Sept

⚠ EXTERNAL EMAIL: Do not click any links or open any attachments unless you trust the sender and know the content is safe. ⚠

Good Afternoon Mr Jeffrey,

Please find attached a joint letter from s47F, and s47F, regarding the North Queensland Simulation Park (NQ Spark).

The correspondence outlines a request for a meeting with you in Canberra to provide an update on NQ Spark's progress and to seek your support in advocating for a variation to the existing grant agreement with the Department of Industry, Science and Resources.

For any further correspondence or to coordinate a suitable meeting time, please don't hesitate to contact me using the details below.

Included in this email are the individuals who will be part of the delegation to Canberra, with the aim of engaging with Defence personnel.

We appreciate the short notice and thank you in advance for your time and consideration.

Kind Regards,

s47F

M s47F E
s47F

143 Walker Street, Townsville QLD 4810 | PO Box 1268, Townsville QLD 4810
[https://www.townsville.qld.gov.au/__data/assets/image/0036/199539/email_banner.jpg]
<<https://www.townsville.qld.gov.au/>>
OUR VISION - A globally connected community driven by lifestyle and nature OUR
PURPOSE - Grow Townsville

Townsville City Council acknowledges the Wulgurukaba of Gurambilbarra and Yunbenun, Bindal, Gugu Badhun and Nywaigi as the Traditional Owners of this land. We pay our respects to their cultures, their ancestors and their Elders, past, present, and all future generations.

[https://www.townsville.qld.gov.au/__data/assets/image/0021/53328/email_footer_Facebook.jpg]
<<https://www.facebook.com/TownsvilleCityCouncil/>>
[https://www.townsville.qld.gov.au/__data/assets/image/0014/53330/email_footer_LinkedIn.jpg]
<<https://www.linkedin.com/company/townsvillecitycouncil>>
[https://www.townsville.qld.gov.au/__data/assets/image/0016/53332/email_footer_Twitter.jpg]
<<https://twitter.com/TSVCouncil>>
[https://www.townsville.qld.gov.au/__data/assets/image/0022/53329/email_footer_Instagram.jpg]
<<https://www.instagram.com/townsvillecouncil/>>
[https://www.townsville.qld.gov.au/__data/assets/image/0017/53333/email_footer_Youtube.jpg]
<<https://www.youtube.com/@TownsvilleCouncil>>

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From: [Trevitt, Hayley Mrs](#)
To: s47E(d)
Cc: [CASG FAS Industry Engagement Coordination; ODIS Business Coord](#)
Subject: RE: Correspondence Regarding NQ Spark – Request for Meeting between 1 Sept - 6 Sept [SEC=OFFICIAL]
Date: Friday, 22 August 2025 12:50:58 PM
Attachments: [NG Spark - DIA Advice.docx](#)

OFFICIAL

s47E(d)

I have engaged with our DIA for NQ and can provide the following:

BLUF: North Queensland Simulation Park (NQ SPARK) is an initiative to grow simulation, test & evaluation and technical workforce capability in North Queensland. NQ SPARK's focus is to catalyse defence industry and research partnerships with presence in the region.

s47C, s47E(d)

The initiative aligns well with the broader Defence strategic interest in enhancing northern bases, simulation enabled test and evaluation capabilities and the complex training and force integration requirements that are required to support combat-ready armoured and aviation capabilities based in the region.

Defence would be interested to receive a detailed briefing and schedule on the plan to realise the NQ SPARK objectives at an appropriate time in the future.

More detailed background in the attached.

s47C, s47E(d)

Open to contrary views or approaches.

Regards,

Hayley Trevitt

Assistant Secretary
Office of Defence Industry Support (ODIS)

T: s47E(d) | M: s22 | E: s47E(d) [@defence.gov.au](mailto:s47E(d)@defence.gov.au)

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NG SPARK INITIATIVE

Background

The NQ SPARK is a Townsville City Council led concept to attract high end industry to Townsville, North Queensland. The concept was originally formed around attract industry to support the Defence adjacent industry in the training and simulation environment.

Capitalising on the placement of 3 Brigade and the military training areas (Townsville Field Training Area (TFAT)), Shoalwater Training Area, Tully Jungle School and the Greenvale Training Area (Currently being designed). Capitalising on the significant Department of Defence investment into people and facilities.

s47B, s47C, s47E(d)



s47E(d)



s47B, s47E(d), s47G



Significant investment has been made onto Lavarack Barracks to support 3BDE and the training requirements of the new platforms and systems arriving. Specific to the ADF and Defence the simulation and training requirements are extensively addressed. s47B, s47E(d), s47G



s47C, s47E(d)



s47B, s47E(d)



s47G



s4 / G

s47G

s47B, s47C

s47E(d)

General observations

Broadly the NQ SPARK has the potential to bring uplift to the North Queensland region through attracting high end industry and a skilled technical workforce. s47B, s47C, s47E(d), s47G



NQSPARK

North Queensland Simulation Park

INTRODUCTION & KEY POINTS

Australia's strategic environment is rapidly evolving. The North Queensland Simulation Park (NQ SPARK) consolidates and exploits the confluence of regional science, defence, health and knowledge expertise to construct an Advanced Environmental Simulation Facility (AESF) as the foundation infrastructure for a technology-oriented collaborative precinct, on a common boundary between Lavarack Barracks, James Cook University (JCU) and Townsville University Hospital (TUH). In so doing, it will significantly enhance Australia's defence sovereign industrial capability while concurrently developing the north of the nation.



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NQ SPARK

IMPROVED HOME-BASE TRAINING FOR NQ BASED FORCES

NQ SPARK

834 JOBS IN CONSTRUCTION

NQ SPARK

SUPPORTING CLINICAL HEALTH EDUCATION AND RESEARCH

NQ SPARK

SUPPORTING DEVELOPMENT OF DEFENCE INDUSTRY

NQ SPARK

739 JOBS WHEN OPERATIONAL

NQ SPARK

DELIVERING THE TOWNSVILLE CITY DEAL



ABOUT NQ SPARK

To be developed in two stages, NQ SPARK will be Northern Australia's primary collaborative industry hub focused on developing sovereign defence industrial capability with a focus on test, evaluation and certification and the collective Defence Science and Technology Group (DSG) STaR Shot.

It is proposed that NQ SPARK will accommodate an estimated 13,400m² of commercial industry space with Cubic specifying the need for 3,400m² in Stage 1 and significant interest demonstrated from within the Defence Industry and the Queensland Police Service (QPS) for Stage 1 and 2 tenancies.



Conceptual illustration only

ABOUT THE AESF



Clinical Simulation Centre

- Simulation enabled incident training, and human machine teaming (HUM-T) test, evaluation and systems assurance facility.
- A high capacity, cutting edge medical training and research simulation centre.

C2 Simulator

- An agile command and control (C2) team performance research laboratory to perform research with Defence Science and Technology StarShot programs, CRCs as well as support the development of C2 training for emergency services, industry and international Pacific engagements.

High Performance Computing

- A High-Performance Computing (HPC) capability providing high-capacity modelling, simulation and gaming systems for cost effective networked technology development and test and evaluation purposes.



Conceptual illustration only

NQ SPARK

Innovation Zone

- It is proposed that NQ SPARK will create a nationally distributed industry, science and technology ecosystem centred on simulation technology, digital visualisation and modelling with a focus on test, evaluation, certification and systems assurance, agile C2 and medical research and training.

- The business case consultation process identified significant interest in NQ SPARK Foundation Membership from:

- Cubic
- Saab
- elmTEK
- ReefWorks
- JCU
- TUH
- University of New South Wales Defence Research Institute (DRI)
- University of South Australia (Uni SA)
- University of Newcastle (UoN)
- Central Queensland University (CQU)



Provide the region with
world-class facilities



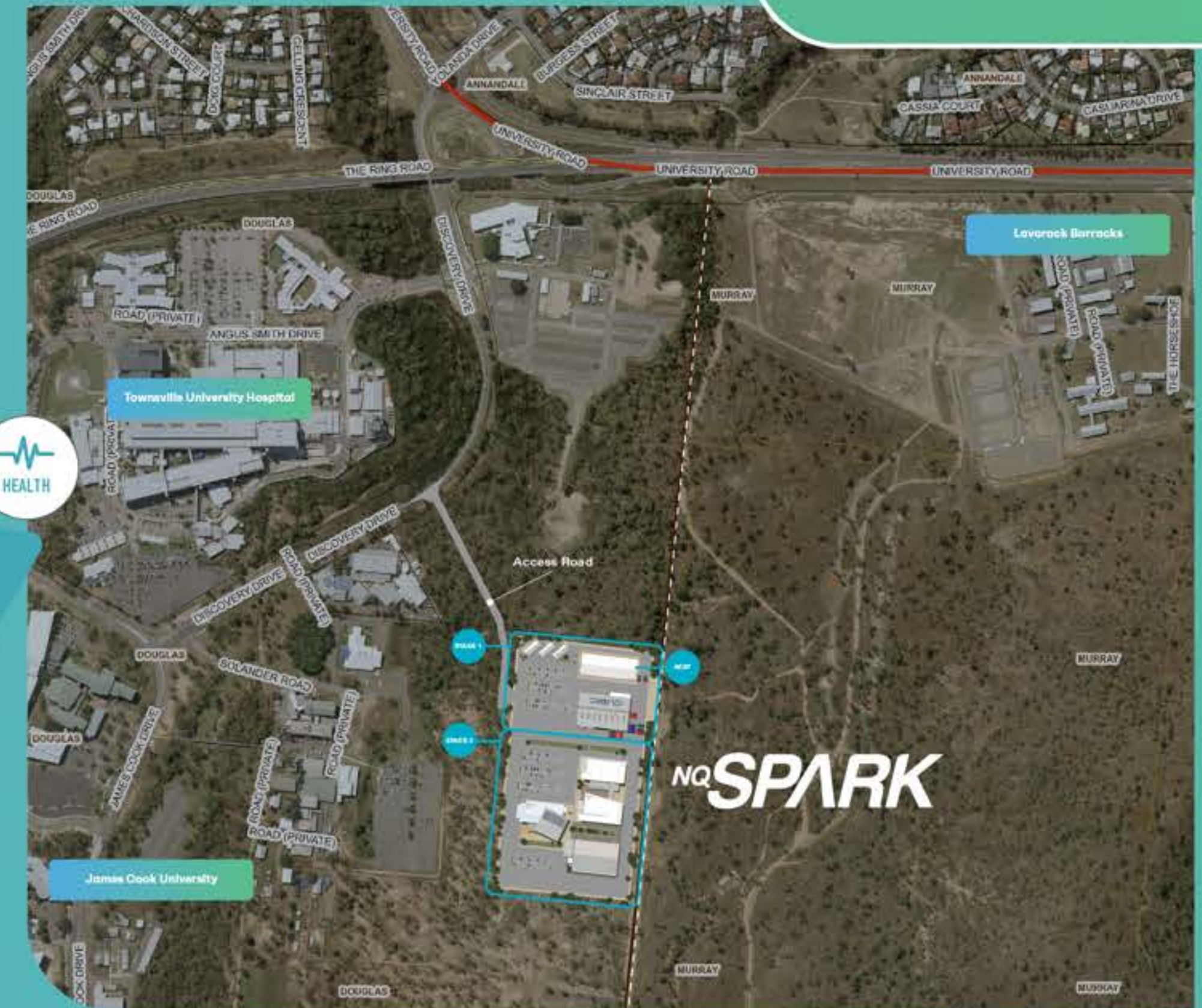
NORTH QUEENSLAND'S STRATEGIC IMPORTANCE

Townsville's strategic role as a major east coast Defence hub, with national and international capabilities as a home, force generation and operational mounting base, provide the region with unparalleled facilities and access to vast, dedicated and fully instrumented ranges including the Townsville and Greenvale Field Training Areas. Recognising the availability of uncongested and uncontested land and air space in the tropics, the Queensland Government and Industry are investing to develop aviation and space test and launch facilities at Cloncurry (The Queensland Flight Test Facility) and Abbot Point (Rocket Launch Facility). These facilities compliment the Australian Government's investment in the Australian Institute of Marine Science (AIMS) and the development of ReefWorks, offering development, design and testing services for marine technologies for both civilian and defence purposes.



TOWNSVILLE AND TROPIQ (UNIQUE COLLABORATIVE ENVIRONMENT)

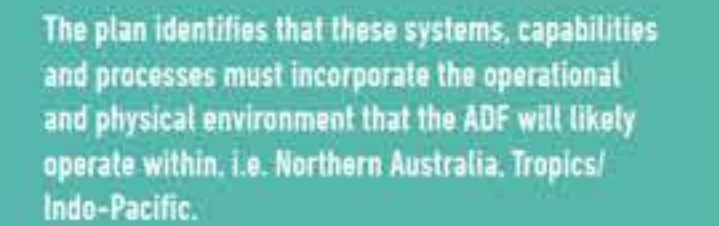
This unique combination of defence, science and health knowledge provides an appereled collaborative opportunity in our nations north.



Conceptual illustration only

WHY SIMULATION IS IMPORTANT

The purpose of this plan is to develop the sovereign test, evaluation, certification and assurance systems needed to provide the ADF with safe, effective and fit-for-purpose products and systems.



The plan also highlights the need to invest in more agile testing methodologies, including the use of models and simulations within live, virtual and constructive environments.

Of note is the fact that organisations involved within the defence industry value chain are located within the south-east of the nation. This reflects the agglomeration effect of government key strategic decisions, policy, functions and investments, particularly centred on Adelaide, Melbourne, Canberra and increasingly Brisbane. While this may be practical, these regions are not representative of Army's disposition, nor the geographic and climatic conditions of the likely areas of ADF operation.

There is an obvious disconnect between the location of ADF technology development, Defence users and the potential area of ADF operation. NQ SPARK will address this.



Leveraging local strengths to diversify
the Northern Australian economy and
build Defence capability

ECONOMIC IMPACT ASSESSMENT

NQ SPARK is expected to deliver considerable economic
benefits to the Townsville and Australian economy.

	CONSTRUCTION	2029-30	2044-45
 OUTPUT	\$255 M Incl \$170 M locally	\$105 M Incl \$89 M locally	\$204 M Incl \$171 M locally
 GRP	\$121 M Incl \$78 M locally	\$58 M Incl \$49 M locally	\$112 M Incl \$95 M locally
 WAGES & SALARIES	\$75 M Incl \$49 M locally	\$37 M Incl \$32 M locally	\$71 M Incl \$61 M locally
 EMPLOYMENT	834 FTE Incl 555 FTE locally	379 FTE Incl 330 FTE locally	739 FTE Incl 645 FTE locally

The Townsville region plays a fundamental part in the defence of the nation

NQ SPARK

PROJECT ASK AND FEASIBILITY

It is proposed that NQ SPARK Infrastructure and the AESF capital costs will be funded through the Townsville City Deal (\$30.4 million). The Australian Government would be responsible for funding for the AESF (\$25.1 million), with the Queensland Government funding infrastructure and connecting services (\$5.3 million).

\$1.5 million in initial working capital is required over the first 5 years from 2022-23, with the assumption made that this will be sourced through Advance Queensland or similar initiative.

It is proposed that commercial tenancy buildings, including Cubic Defence Australia (\$12.7 million), will be funded under the Northern Australia Infrastructure Facility (NAIF).

NQ SPARK will need to secure an average of \$2.5 million in Defence innovation funding annually to ensure the facility's long-term financial viability.

NQ SPARK will be equipped with cutting-edge technology systems and training and research facilities

NQ SPARK



Letters of support

OFFICIAL



The Hon Melissa Price MP
Minister for Defence Industry
Member for Darack

David.burke@townsville.qld.gov.au

MB21-000368

Dear Mr Burke

Thank you for your email of 04 March 2021 about the North Queensland Simulation Park. I understand the driver of this proposed initiative is the Townsville City Deal.

Simulation is one of a number of priority future investments for Defence to enable greater training and technological development to prepare Defence for the range of missions it will face now and in the future. Simulation parks can therefore provide opportunities for Australian industry to demonstrate its innovation and ability to support the Defence mission.

The development of a North Queensland Simulation Park enabling simulation training and employment and development of cutting edge technology is therefore aligned with Government's intent detailed in the 2020 Defence Strategic Update and 2020 Force Structure Plan. You are encouraged to continue to engage across the Defence Industry base to explore opportunities.

While I support this initiative in principle, the proposed location on the boundary of the Lavarack Barracks needs to be assessed as it may impact Defence activities. It is important to note that the Department of Defence undertakes regular reviews of its property needs to define and plan the estate to support current and future capability.

I suggest further engagement with the Department of Defence to fully understand this proposal and the potential impacts. The point of contact for this activity is:

Mr Adam Kalman,
Director Estate Planning Branch
Email: adam.kalman@defence.gov.au
Ph: 02 5109 6073.

Thank you for bringing this development to our attention.

Yours sincerely

Melissa Price

28 APR 2021

Parliament House Canberra ACT 2600
OFFICIAL



Australian Government

AUSTRALIAN INSTITUTE
OF MARINE SCIENCE

TOWNSVILLE | DARWIN | PERTH

12 Aug 2021

Dear Sir/Ma'am,

I am writing to express my wholehearted support for the North Queensland Simulation Park (NQ SPARK): a ground-breaking, multi-user advanced environmental simulation facility based in Townsville.

As Australia's tropical marine research agency, the Australian Institute of Marine Science employs cutting edge technologies to enhance the capability and efficiency of our routine operations. AIMS is working with regulators and partners to establish a viable maritime autonomous systems industry that can meet Australia's growing marine research needs.

AIMS Townsville is home to ReefWorks – Australia's tropical marine technology test range. ReefWorks provides a streamlined pathway for transitioning marine technology innovation, especially marine autonomous systems, from development through to operations. It is the enabler for the agile development needed to meet the rapidly evolving marine autonomous systems sector needs.

The majority of test and evaluation activities for autonomous systems are conducted in a digital environment. ReefWorks is establishing a digital twin of its test ranges to meet the digital test environment need. The preferred option for ReefWorks to deliver this capability is through a partnership with NQ SPARK.

NQ SPARK provides a multi-domain simulation centre that not only will provide a formidable enhancement to Australian marine operations, but it will also facilitate cross-domain communication. For the first time, industries will be able to share technology advancements in a common language, independent of whether the domain is health, emergency response, land, sea, or air, through visual observation and collective understanding.

We are looking forward to working with NQ SPARK to ignite Australia's innovation in marine autonomy into a thriving market sector servicing the world.

Best Regards,

Melanie Olsen
ReefWorks Project Director
Australian Institute of Marine Science
<https://www.aims.gov.au>



Cubic Defence Australia
336-342 Beyswater Road
Garbutt QLD 4814

14 September 2021

David Lynch
Senior Consultant
AEC Group
233 Flinders Street East
Townsville QLD 4810

Dear David,

On behalf of Cubic, I am extremely pleased to provide this letter of support for the North Queensland Simulation Park (NQ SPARK) capability.

Cubic commenced its Australian operations in Townsville in 2006 and, since then, has consistently grown its operation as the demand for cutting edge simulation-enabled training and systems increases. Throughout that growth, we have maintained our National Headquarters in Townsville, including a substantial managerial and specialist technical workforce.

Cubic is proud to be based in North Queensland alongside the Australian Army's largest land base, nationally significant air and sea force projection capabilities and large, flexible training ranges. We foresee significant growth in investment into technology will be activated by the approval of the SPARK NQ capability.

Cubic's interest in NQ SPARK is as follows:

- NQ SPARK would be an ideal location for our Australian headquarters and we see value in securing the position of anchor tenant. This would mean relocating our current business operations from Garbutt to the NQ SPARK precinct. Cubic would also relocate its Systems Integration Laboratory to the new precinct.
- Cubic is a global developer of Exercise Control and situational awareness software. Many countries around the world use Cubic's software, which is currently developed in Scandinavia and New Zealand. Cubic is considering the location of an additional global Exercise Control software development and Live, Virtual, Constructive (LVC) Systems Integration and Test capability. We would look favourably upon the NQ SPARK location as a potentially suitable site.

Page 2

- The provision of technical and support services including managing the integration, development and operation of NQ SPARK if commercial solutions for those services were requested. Cubic has existing spectrum licensing for Band 1 Long Tier Evolution 4G / 5G network capability at the NQ SPARK location and would agree to make that spectrum available on a commercial basis to support system test, qualification and certification at the site.
- Cubic has a large cadre of former military and technical experts and is also Registered Training Organisation (RTO). In partnership with NQ SPARK academic stakeholders, Cubic is able to offer professional pathways to Townsville based veterans and technology graduates with simulation credentials by offering Certificate Level Vocational Education and Training (VET) courses such as the Certificate III in Digital and Interactive Technologies.
- Use of the facility to support Army HomeStation Training, Human Machine Teaming qualification testing and delivery of Care of the Battle Casualty.

I believe NQ SPARK would be a game changing Defence industry activation capability, as well as a nationally significant academic development capability located in a strategically significant Townsville.

My team looks forward to working with the NQ SPARK stakeholder group to develop tech-enabled jobs and grow the professional capability of the veteran workforce in Townsville whilst developing sovereign capabilities in System Integration and Test and helping to improve the operational readiness of the ADF through projects based at NQ SPARK.

For additional information relating to Cubic's involvement with NQ SPARK, contact Mark Horn, Director Strategic Development, Oceania, 044 888 1341 or email at mark.horn@cubic.com.

Yours sincerely,

Mike Knowles
President
Cubic Mission and Performance Solutions (CMPS)
michael.knowles@cubic.com
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Letters of support



Saab Australia Pty Ltd
AUS 98 038 843 212

23 August 2021

David Lynch
Project Lead – Senior Consultant
North Queensland SPARK

Saab Australia – Letter of Interest for NQSPARK

Dear David,

My team has briefed me on the NQSPARK initiative and I understand that you will submit your business case soon and aim to be operational in 2024. I would like to confirm that Saab Australia is supportive of this initiative. We will engage with your team and other partners to develop opportunities for collaboration and innovation.

There are a number of areas of interest for Saab Australia in the NQSPARK, enabled by our Deployable Health Care sovereign capability, our ambitions in the broader Deployable Infrastructure domain, Live Instrumented Simulation, and our Mixed Reality enhanced visualisation tools.

Please feel free to include this letter of support in your business case and I wish you success in securing the required funding. Marc Bryant and Amany Wahba will continue to be your primary contacts at Saab Australia. I look forward to seeing the NQSPARK develop into a world-class facility.

Yours sincerely,

Andy Krough
Managing Director
Saab Australia

Saab Australia Pty Ltd
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David Burke
Defence Engagement Officer
Future Cities
Townsville City Council
103 Walker Street
Townsville QLD 4810

Via Email: David.Burke@townsville.qld.gov.au

Dear David

RE: NQ SPARK and TropiQ

James Cook University is very excited to be involved with this project both in terms of the facility being located on our Bebegu Yumba campus here in Townsville as part of the TropiQ initiative and the opportunities it will bring to JCU in our teaching and research endeavours.

Having the largest tertiary hospital in Northern Australia, the Townsville University Hospital, a world leading research university, James Cook University, and the largest defence base in Australia, Lavarack Barracks, all co-located, means that the opportunities that exist to leverage the significant investment already in existence in terms of expertise and infrastructure, makes this project particularly exciting.

The partnerships and collaborations which will flow from this initiative will create opportunities for into the future.

JCU is very supportive of this project and NQ SPARK complements the intent of TropiQ and we look forward to working with you to bring the project to fruition.

Yours sincerely

Tricia Brand
Deputy Vice Chancellor Services and Resources



Townsville Hospital
and Health Service

Mr David Lynch
Senior Consultant
AEC Group Pty Ltd
E: David.Lynch@aecgroup.com.au

Dear David

Letter of Support – North Queensland Simulation Park (NQ SPARK)

I write to formally express the support of the Townsville Hospital and Health Service (THHS) for the proposed NQ SPARK project and our intention to be a significant user of the Clinical Practice facilities.

NQ SPARK will allow the THHS to defer future investment in highly specialised simulated training infrastructure and provide access to cutting-edge technology and simulation expertise, ensuring currency and delivery of training to our clinical workforce across the north.

Furthermore, I see the following as key motivations for our involvement in this project:

- Opportunity for NQ SPARK to support THHS's role as a tertiary hospital to collaborate, develop and deliver world-class health technology and services to the north including into remote indigenous communities. Synergies & benefits that this work will provide to the Australian Government's commitment to support our friends & neighbours in the Pacific.
- The opportunity that NQ SPARK will provide for THHS to collaborate with the Defence industry in developing new technology and techniques within the area of defence medicine broadly and the development & evaluation of deployable health capability under JP 2060.
- NQ SPARK's status as a pioneering project under the TropiQ partnership & in developing TropiQ as a world-class centre for innovation in the tropic, with strong collaborative regional, national & international connections.

Yours sincerely,

Professor Kieran Keyes
Health Service Chief Executive
Townsville Hospital and Health Service
20 Aug 2021

Townsville Hospital and Health Service
Queensland Government
www.townsville.health.qld.gov.au

T: +61 07 4433 4372
F: +61 07 4433 4372

100 Angus Smith Drive
Darwin QLD 5114



16 September 2021

David Lynch
Senior Consultant
AEC Group Pty Ltd

Dear David

The UNSW Defence Research Institute is pleased to offer our support for the NQ SPARK project. We believe that this multi-user advanced environmental simulation facility will deliver significant collaboration opportunities for the Defence Research community in order to meet the needs of Defence.

The Institute is headquartered in Canberra at the Australian Defence Force Academy and is a continuation of UNSW's long standing support to Defence research and education. The Institute provides a focal point for defence-related research collaboration, supporting our academic and industry to develop and deliver ground-breaking defence and security research for Australia.

The Institute, and UNSW will, are supportive of the NQ SPARK project. This project will significantly enhance Australia's sovereign Defence capabilities in an innovative and partnered environment. Many UNSW alumni from the Australian Defence Force Academy serve in Townsville within the years of their careers, in fact 50% of the Institute's staff served in Townsville during their military careers. I see Institute's involvement in the project is a natural progression of our collaboration with defence, academia, and industry.

Our research strengths, including in Data Science, Artificial Intelligence, Machine Learning and Systems Modelling will complement the expertise of our partners in the NQ SPARK project. We also welcome the opportunity to connect the NQ SPARK with the UNSW Canberra Defence and Security Innovation Precinct being built at the new UNSW Canberra City campus in the heart of Canberra's innovation corridor.

We are looking forward to working with the NQ SPARK team and the other partners involved in bringing this vision to life.

Yours sincerely

Paul Maddison
Professor of Practice
Vice Admiral (Ret'd)
Director, UNSW Defence Research Institute

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Distribution: Limited Release to AEC Group Pty Ltd

Letters of support



23 September 2021
Mr David Burke
Defence Engagement Officer
Townsville City Council
Townsville QLD 4810

Dear David,

It is with great pleasure that I write you this letter of support for your NQ SPARK initiative. Your plans for a research, training and innovation campus in Townsville fit in perfectly with our mission, which is to provide facilities, support and skills to Queensland's researchers, especially those of our Members, including the James Cook University. Your campus will help us enormously to deliver our mission.

QCIF provides data intensive research infrastructure, services and skills development for our members and the NQ SPARK also aims to provide such platforms and staff to support research and innovation in the field of visualisation and training that will transform the capabilities of the University, the hospital and the Army in Townsville. The outputs that will flow from this campus will directly benefit Townsville and the surrounding areas in terms of generating inward investment, creating a cohort of trained and skilled practitioners and producing a flow of IP and products, services and jobs based on it. It will also help to accelerate positive sovereignty and security developments, economic impact and growth in employment across the State and the Country. For our part, every project that the NQ SPARK delivers will help QCIF to achieve its aims and benefit its members.

We were already co-ordinating with our Members and private sector partners to try and create a data-intensive R&D and innovation focussed centre for Queensland, based in part on the model of The Hartree Centre (<https://www.hartree.cfd.ac.uk/>) in Northwest England, a Centre which I succeeded in creating and delivering for the UK several years ago. Townsville is a very attractive possible home for this Centre and I am keen for us to seek opportunities for us to dovetail this initiative with the NQ SPARK.

As an experienced procurer and operator of many supercomputing systems and services, QCIF would be delighted to offer its services to you, both as "buyer's friend" for your procurement, helping with sizing and defining the systems you will need, and then as operators of them for and on behalf of you and all of the NQ SPARK stakeholders and users.

Our shared objectives include bringing infrastructure, skills and investment to regional and rural Queensland to help to create high tech growth and spread the benefits of "Industry 4.0" across all our Members and our State. We see multiple synergies between our existing plans and the NQ SPARK initiative. The opportunity to work with colleagues in industry, the health sector and the defence force only enhances our appetite to work with and co-invest in your campus. We wish you the very best in your efforts to secure the funding to deliver the NQ SPARK. We are certain that it will deliver all the benefits you have identified and QCIF will actively support it in every way it can.

Yours sincerely

Prof. John Bancroft
Chief Executive Officer, QCIF

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21 July 2021

To whom it may concern,
RE: NQ SPARK

CQUniversity is very supportive of NQ SPARK's ambition and intention to build a simulation training park in Townsville.

This project will support and assist the Australian Defence Force capabilities while at the same time benefiting the community by increasing economic prosperity for the broader region and by providing employment opportunities for local qualified workforce.

CQUniversity look forward to possible collaboration opportunities with NQ SPARK related to:

- knowledge and skills required by the defence industry,
- education initiatives – specifically those related to simulation technologies across a broad range of disciplines,
- collaboration on research initiatives.

The Townsville region possesses significant Australian Defence Force representation already offering world class research, development, training, and simulated service capabilities. The region is innovative and the ideal location for the establishment of NQ SPARK and further development of the Australian Defence industry.

As the only comprehensive university in Queensland, CQUniversity is excited to work with NQ SPARK in delivering both vocational and higher education programs and to partner and support, with the appropriate funding arrangements, the skills and capability development objectives of this project.

Prof Pierre Viljoen
Associate Vice President (North Queensland & Hinterland) &
Chair in Automation and Future Work Skills
CQUniversity Australia

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CQUniversity Ltd ABN 62 000 000 000



26 July 2021

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Mr David Burke
Defence Engagement Officer
Future Cities
PO Box 1265, Townsville QLD 4810

Dear David,

On behalf of the University of South Australia (UNISA), I am writing to express my support for the North Queensland Simulation Park (NQ SPARK) project.

As Australia's University of Enterprise, UNISA's strong record in research in the medical and defence sectors positions us well to provide support to the SPARK team.

- We have a long standing relationship with the Defence Science and Technology Group (DSTG) with research projects in both health and defence in:
- Augmented & virtual reality
 - Artificial intelligence
 - Command and control and modelling and simulation

We look forward to working with the other NQ SPARK stakeholders on this exciting project and continue to contribute to innovative solutions for the defence and medical sectors.

Yours sincerely,

Matt Opre
Director, Defence & Space

UNISA.EDU.AU

AUSTRALIA'S UNIVERSITY OF ENTERPRISE



20.7.2021

Dear David,

Thank you for the invitation to learn about the SPARK project, I believe that the concept and proposal is excellent. From a regional perspective it draws upon Townsville's relationship to several major pieces of R&D and training infrastructure. The key partners are very well placed to contribute to the initiative and represent a well-rounded mix from several sectors. As the Director for the Centre for Advanced Training Systems, at the University of Newcastle, I have been extensively engaged with developing training solutions for large organisations, especially in the Defence and Health sectors. Our Defence projects regularly bring us to Townsville, where we employ several staff on research, test and evaluation projects. For the Centre, having a presence within the SPARK environment would be incredibly valuable for our engagement with first responder agencies in Queensland. To date, the bulk of our activity has been focused on developing improved training frameworks for responding to high consequence and time critical events. We see great value is contributing to the growth and sustainment of the SPARK ecosystem. The multi-purpose instrumented facilities would be useful for a diverse range of projects that we envisage both now and in the future.

Best regards,

Professor Rohan Walker
Director | Centre for Advanced Training Systems
University of Newcastle

NQ SPARK

NQ SPARK is being developed under the TropiQ partnership with support from James Cook University, Townsville Hospital and Health Service, Townsville City Council and Queensland Government.



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TropiQ

September
2020

North Queensland Simulation Park - Feasibility Analysis



Townsville City Council
City Economist Office

NQ SPARK Feasibility Analysis

Job Name: NQ Simulation Park (SPARK) Feasibility Analysis

Project Manager: David Burke

Project Director: David Lynch

Author

Author	Title	Date
David Burke	Defence Engagement Officer	

Revision History

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Disclaimer

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1. Introduction

1.1 Purpose of the Report

The purpose of this report is to provide a high-level feasibility analysis of the proposed NQ SPARK development to:

- Define the concept
- Provide a high-level assessment of the need, value and viability of the concept
- Inform the investment decision making process

1.2 Methodology

The analysis assesses the proposal and presents a recommendation on feasibility based on:

- needs (demand) analysis, including a high-level appraisal of user requirements and stakeholder needs
- development concept overview, detailing the utilisation plan, industry investment opportunities and initial functional design brief
- ownership, governance, and operational model
- Financial viability
- Economic impact

1.3 Sources of Information

Preparation of the analysis sourced information and data from:

- stakeholder interviews
- operational data for similar facilities
- stakeholder capability portfolios
- defence industry opportunity reports
- government policy and strategic planning documents (National, State and Local)
- corporate planning documents
- Australian Bureau of Statistics (ABS)
- National Institute of Economic and Industry Research (NIEIR)

1.4 Consultation

The following stakeholder groups were consulted in the preparation of this analysis:

- Townsville University Hospital
- James Cook University
- TropiQ
- Cubic Defence Australia and Global
- Department of Defence, Estate, and Infrastructure Group
- Defence Science and Technology Group
- Queensland Department of State Development, Tourism and Innovation
- Queensland Police Service
- University of South Australia
- University of NSW Defence Research Institute (DRI)
- Austrade Representative Singapore

2. Background

2.1 Regional Economic Role

Townsville is the largest city in Northern Australia. Established in 1865, as a port to service the area's pastoral industries, it has grown as a major administrative, manufacturing, defence, university, and logistics hub of approximately 200,000 people.

Townsville is the anchor city for the greater North Queensland region (north of Mackay). It retains a pivotal role in the region's supply chain – connecting nationally significant productive zones to global markets. It is a prime location to base manufacturing and value-adding industries related to mining and agriculture. As illustrated in Figure 1, the city's primary economic zone stretches from Bowen in the south to Hinchinbrook in the north and Mount Isa to the west.

As discussed in 2.3 below, the City and the Region it supports, plays a major role in the defence of the nation.

Figure 1: Townsville North Queensland Economic Zones



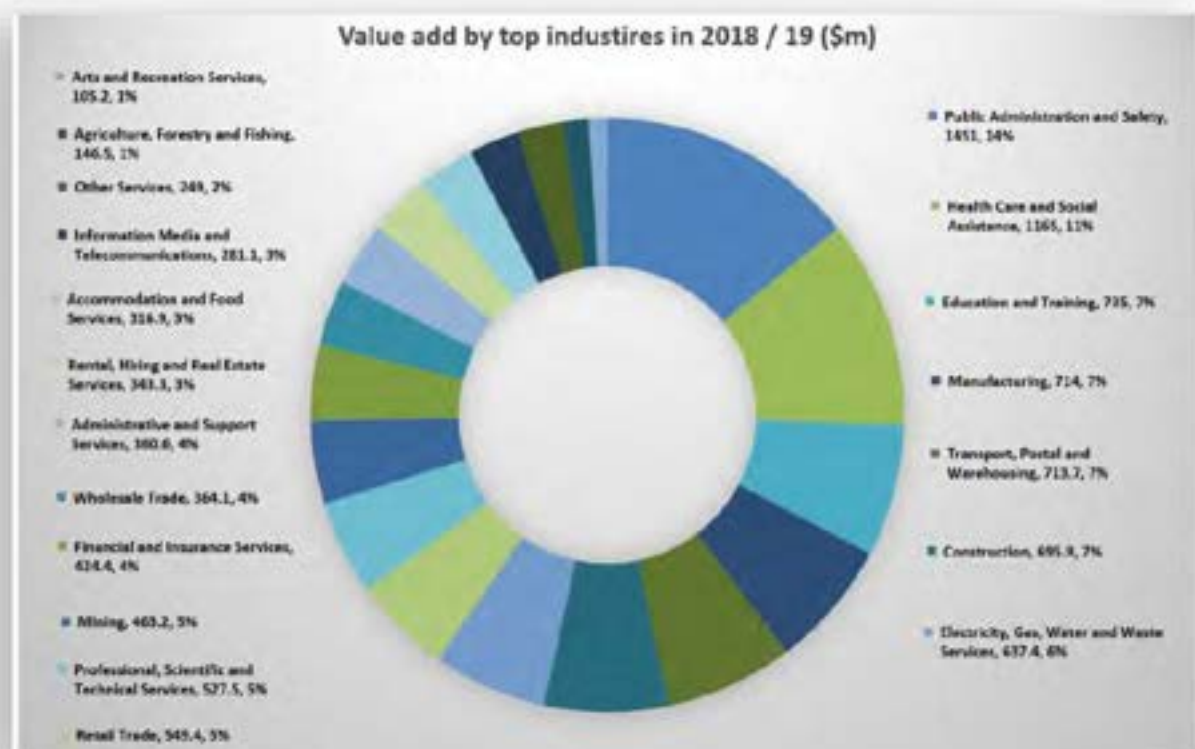
2.2 Key Industry Sectors

With Gross Regional Product estimated at \$11.74 billion¹, Townsville's largest sectors by value of production reflect the city's role as North Queensland's hub for public administration and defence, health, education, manufacturing and transport and logistics services (Townsville's manufacturing sector is significantly driven by demand from regional mining and agriculture).

The industry sectors that contribute the most value to Townsville's economy are:

- Public Administration and Safety (includes Defence) (14%)
- Health and Social Assistance (11%)
- Education and Training (7%)
- Manufacturing (7%)
- Transport, Postal and Warehousing (7%)
- Construction (7%)

Figure 2: Townsville Industry Sectors by Value



Source: National Institute of Economic and Industry Research (NIEIR)

2.3 Defence of the Nation

Townsville is critical to the defence of our nation. The city's role is evident in the pivotal part played as a forward mounting base for the war in the Pacific (1942 – 45) and for most Australian Defence Force (ADF) deployments since including: Vietnam; Fiji; Rwanda; Somalia; East Timor; Iraq; and, Afghanistan.

¹ NIEIR 2019

Current defence assets and capabilities located within or in proximity to Townsville include:

- Lavarack Barracks – home to 3 Brigade, 11 Brigade (Reserve) and the Amphibious Taskforces landing forces (2 RAR group)
- Ross Island Barracks – home to 10th Force Support Battalion, 30 Terminal Squadron, 35 Water Transport Squadron and the Army School of Transport – Maritime Wing
- The Australian Army Combat Training Centre - delivering advanced collective combat training to ready, prepare and certify forces for deployment
- Defence Training Areas including the Townsville Field Training Area, Greenvale Training Area, Mount Stuart Training Area, Tully Field Training Area, Cowley Beach Field Training Area and Rattlesnake Island bombing range
- RAAF Base Townsville – a jointly operated military/civilian airfield capable of accommodating all RAAF aircraft and home to the Australian Army's 5th Aviation Regiment
- Port of Townsville – a deep water port capable of accommodating Australian and allied capital ships, including the RAN's Canberra Class LHD's
- Established transport and logistics capabilities including heavy equipment transport facilities with direct road, rail and sea port access

Combined - over one third of the Army's deployable combat capability is housed within Townsville. Nearly 6000 Defence force personnel and an estimated 9000 military veterans and their dependents (~8% of Townsville population) call the city home.

Also significant is the high number of ex-Defence personnel who remain in Townsville and make up an influential component of the local community. This ready veteran workforce retains defence clearances, along with highly desirable skills, experience, and qualifications.

2.4 Organisational Partners

The following organisations are considered as being key NQ SPARK partners.

2.4.1 Research and Health Institutions

A central feature of Townsville's economy is the ongoing investment in applied science, research, development and health services. Major institutions delivering this capability include:

- James Cook University (JCU)
- the Great Barrier Reef Marine Park Authority (GBRMPA)
- the Australian Institute of Marine Science (AIMS)
- the North Queensland operations for the Commonwealth Scientific and Industrial Research Organisation (CSIRO).

Collocated with JCU and the CSIRO, and immediately adjoining Lavarack Barracks, Townsville University Hospital (TUH) is a tertiary referral hospital treating patients from as far north as the Torres Strait Islands, and west to Mount Isa and the Gulf of Carpentaria. It is also the major teaching hospital for JCU's schools of medicine, nursing and allied health and TAFE North Queensland. TUH is a recognised health research hub, with a state-of-the-art, dedicated research space, on the cutting edge of tropical medicine research with clinical trial partnerships both onsite and via telehealth.

2.4.2 TropiQ

Townsville's position as a global centre for tropical health and science underpins the mission of the Townsville Tropical Intelligence & Health Precinct (TropiQ). Dedicated to high-end research in tropical health and science, TropiQ brings together, in one location, JCU, TUH, the CSIRO, the ARC Centre of Excellence and local Defence establishments at the neighbouring Lavarack Barrack army base. Further information on TropiQ is available from tropiq.com.au

2.4.3 Cubic Defence Australia

Founded in Townsville in 2007, using the experience, skills and expertise of the city's ex-Defence community, Cubic Defence Australia (Cubic) has grown to be a world-leading prime contractor for simulation enabled training systems as well as advanced command and control systems.

From its headquarters in Townsville, Cubic offers training and simulation systems and services, as well as Command, Control, Communications, Computers, Intelligence, Surveillance and Intelligence (C4ISR) solutions, across Australia through operations based at Townsville, Brisbane, Amberley, Williamstown, Sydney and Canberra. Current ADF programs administered by Cubic include:

- The Combat Training Centre (Live Instrumentation System)
- Australian Defence Simulation Training Centre
- Navy Synthetic Warfighting Centre
- Air Combat Manoeuvring Instrumentation
- Advanced Training Services (Advanced exercises and specialised advanced training)
- Training Range Technical Services (Range communications and range safety network systems)

Further information is available at www.cubic.com/cubic-defence-australia.

2.5 Strategic Alignment

NQ SPARK is consistent with and strongly aligned to the following government policy and strategic planning and development initiatives.

2.5.1 Townsville City Deal

The Townsville City Deal (TCD) is a 15-year commitment between the Australian Government, the Queensland Government and Townsville City Council for a program of planning, reform and investment in Townsville. The Deal establishes a shared vision with the objective of Townsville becoming, by 2030:

- the economic gateway to Asia and Northern Australia
- a global leader in tropical and marine research and innovation
- a prosperous and highly liveable city for residents and visitors.

It recognises and confirms Townsville's development as a 'Defence Hub' and advocates for the establishment of a co-located health and knowledge employment hub. For further information on the Townsville City Deal see: www.townsville.qld.gov.au/about-townsville/business-and-economy/townsville-city-deal

2.5.2 Townsville Health and Knowledge Development Strategy 2020

A TCD commitment, the Townsville Health and Knowledge Strategy (THKDS) identifies, based on regional strengths, key opportunities to grow health and knowledge industries in Townsville and explores how Townsville can leverage its competitive advantages to deliver economic growth in the next decade.

The Strategy outlines strategic industry opportunities to grow Townsville's smart economy and competitive advantages as:

- o A leader in health and science in the tropics.
- o A world-class reef economy.
- o An innovative place.
- o A liveable and connected community.
- o A thriving Defence Force.
- o A gateway to the Asia-Pacific.
- o A centre for sustainable manufacturing.

The THKDS provides insights for industry to establish a world-class health and knowledge ecosystem with a lasting impact. The THKDS also highlights existing infrastructure and services, and significant investment in Townsville through Australian and Queensland funding and initiatives.

2.5.3 Townsville North Queensland Defence Strategy 2020-2030

Inter alia, the strategy aims to 'Collaborate to Innovate'; This being to 'Encourage collaboration between Defence, Defence Industry, Government and Academia, focusing on research development and innovation.'

Defence simulation training and a soldier systems centre of excellence are identified as a 'high payoff opportunities'. This is the nucleus for NQ SPARK. For further information on the Defence Strategy see: www.townsville.qld.gov.au/about-townsville/business-and-economy/townsville-north-queensland-defence-strategy

2.5.4 Defence Policy

In response to a rapidly changing strategic environment, the Defence Strategic Update 2020 (<https://www.defence.gov.au/strategicupdate-2020/>) aims to deliver credible deterrence and respond to challenges to Australia's interests. The strategy is underpinned by policies developing a strong, sustainable, and secure Australian defence industry and supporting leading edge national innovation, including in regional areas.

The Force Structure Plan 2020 acknowledges training and simulation is critical to prepare Defence for the range of missions it will face now and in the future, and develop the cutting-edge technology needed to maintain a competitive advantage. The plan details defence investment in training areas and facilities, live and simulated, and simulation software and technology refreshes.

2.5.5 Australia Singapore Comprehensive Strategic Partnership

Announced in 2015, the Australia-Singapore Comprehensive Strategic Partnership (CSP) is founded on shared strategic perspective and complementary economies. The CSP is a ten year plan (2015-2025) to enhance strategic, trade, economic, defence and people to people links, to deepen collaboration in all areas of bilateral relations and enhance the integration of economies in order to

NQ SPARK Feasibility Analysis

achieve closer economic ties. The two countries will accelerate collaboration in innovation, science, research and technology, capitalising on respective and complementary strengths. Townsville has particular insight into the CSP through the establishment of the JCU Singapore Campus (www.jcu.edu.au/about-jcu/campuses/singapore) and the Australia Singapore Military Training Initiative discussed below.

2.5.6 Australia Singapore Military Training Initiative

The Australia-Singapore Military Training Initiative (ASMTI) (www.defence.gov.au/initiatives/asmti) is building advanced Defence capability and enhancing Australia's bilateral relationship with Singapore, while providing enduring economic benefits to Central and North Queensland.

Under the ASMTI, Singapore is investing around A\$2.25 billion to develop and enhance training areas at Greenvale and Shoalwater Bay to meet the needs of the ADF and facilitate an increased presence of Singapore Armed Forces (SAF) personnel. When the ASMTI reaches maturity, up to 14,000 SAF personnel will conduct training in Central and North Queensland over 18 weeks each year.

2.5.7 Queensland Defence Industries Road Map

The Queensland Defence Industries 10-Year Roadmap and Action Plan is Queensland's plan to support growth in the defence sector. The vision under the Roadmap is to significantly increase defence revenue and generate 3500 new full-time jobs by 2028. This will be achieved through a range of actions across three strategies:

- grow Queensland's defence industry capability
- significantly increase Queensland's defence industry contribution to the national and global market
- promote Queensland's defence industry capabilities

Further information is available at www.dsdmip.qld.gov.au/resources/plan/defence-industries/defence-industries-roadmap.pdf

2.5.8 Our North, Our Future: Northern Australia Development White Paper

The Australian Government's White Paper on Developing Northern Australia sets out the priorities to drive growth in Australia's north. It's a 20-year plan for investment and collaborative support to grow the north through:

- simpler land arrangements to support investment
- developing the north's water resources
- business, trade and investment
- infrastructure to support growth
- the northern workforce
- good governance

Further information is available at www.industry.gov.au/data-and-publications/our-north-our-future-white-paper-on-developing-northern-australia

2.5.9 North Queensland Regional Plan

The North Queensland Regional Plan (NQ Plan) is a 25-year strategic, statutory planning document for the local government areas of Burdekin, Charters Towers, Hinchinbrook, Palm Island and Townsville (North Queensland). It has been prepared to support established and emerging industries

NQ SPARK Feasibility Analysis

and to address changes expected to occur within the region. It facilitates economic opportunities over the short, medium and long-term. These opportunities include growing the region's established economic industries, as well as capitalising on new opportunities in emerging markets.

Further information is available at <https://dsdmipprd.blob.core.windows.net/general/north-queensland-regional-plan-full.pdf>.

2.5.10 Townsville Economic Gateway

Townsville Economic Gateway (TEG) recognises and brings together relevant policies, strategies, plans and initiatives to create a unified vision for the City based on developing the following productive precincts:

- CBD
- Port of Townsville
- Townsville State Development Area
- TropiQ
- Defence
- Townsville Airport
- Lansdown Eco-Industrial Precinct

Further information on TEG is available at www.townsvillegateway.com

3 Opportunity

3.1 Townsville's Simulation Potential

Through the capabilities of Cubic Defence Australia, Townsville is at the forefront of large-scale simulation training, and the development of cutting-edge technology. The region has been recognised in successive studies, including the regional Defence and Health and Knowledge strategies, as ideally positioned to leverage local, world-class expertise to deliver investment and highly skilled jobs supporting simulation and human performance research and technology development.

NQ SPARK consolidates and exploits the unique confluence of defence, health and knowledge and simulation expertise to construct a multi-user Advanced Environmental Simulation Training Facility (A-ESTF) as the foundation infrastructure for an Advanced Training and Experiential Centre of Excellence in Soldier Systems and Human Performance Studies. The facility will have flexible, multipurpose applications not only as an advanced training facility, but also an experimentation centre for research, development, and human performance studies. Several leading national universities and multinational industry partners with expertise in simulation and defence technology have expressed interest in the project.

In effect a unique opportunity presents to develop a collaboration hub housing a cluster of defence, industry, health, research, and education on a shared geographic location. As illustrated in Figure 3, NQ SPARK will be positioned on a common boundary between Lavarack Barracks, the Townsville University Hospital and James Cook University and close by two world-class, instrumented, military training areas (Townsville and Greenvale): a location unrivalled in Australia.

Figure 3: Proposed Simulation Park (NQ SPARK) Location



NQ SPARK Feasibility Analysis

NQ SPARK will both compliment and support the \$800 million ASMTI investment to develop a state-of-the-art military training area in Greenvale, north west of Townsville to augment the existing Townsville Field Training Area. The range will be purpose built with integrated instrumentation to support simulation enabled training. The proposed NQ SPARK will be the only training and research simulation precinct in Australia with direct access to two world-class, instrumented, military training areas.

Establishing a modern simulation facility in Townsville will provide a collective opportunity for locally based businesses to participate with simulation industry leaders attracted to the facility in a rapidly expanding global market. The global Virtual Training and Simulation market size is estimated at US\$315 billion with a compound annual growth rate of 17%. NQ SPARK provides the opportunity for Australia to lead and capitalise on this market development.

The Project will also support Australia's whole of government aspirations for resilience and self-reliance by delivering sustainable socioeconomic outcomes to the Townsville North Queensland Region through supporting Australia's Defence and national security needs and capability.

3.2 Business Opportunities

Simulation is the future of training and skills development. Immersive training, education and research programs will combine augmented, extended, and virtual reality systems to create individually tailored, high competence level training experiences in a range of complex, dangerous, and seldom undertaken tasks. These high-fidelity systems reduce risk, effectively target resource expenditure, and improve overall performance. Applications extend across an increasing number of industries and organisations including but not limited to:

- Defence
- Health
- Police, Fire and Emergency Services
- Disaster Response
- Maritime
- Aviation
- Mining
- Oil, Gas and Offshore Drilling

Both the Townsville University Hospital and JCU undergraduate related courses have a continuous requirement for qualification and currency training. The availability of the A-ESTF will provide a cost-effective way to provide a tailored and safe training environment with enhanced learning outcomes.

NQ SPARK will construct and operate the multi-user A-ESTF providing access to world-class configurable simulation facilities on a cost-effective fee for service basis. Details of the financial operation of the A-ESTF are contained in Chapter 7.

NQ SPARK's location, on a common boundary between Lavarack Barracks, the Townsville University Hospital and James Cook University, and in proximity to world-class military ranges, provides a unique opportunity to collocate defence industry within an opportunity rich and collaborative environment. It is proposed that Cubic Defence Australia will be the foundation tenant, with the initial intent to consolidate defence training, simulation and C4ISR systems supply chain and research and development activities within NQ SPARK.

The Defence Science and Technology Group (DSTG) are, inter alia, responsible for the \$730 million Next Generation Technology Fund and \$640 million Defence Innovation Hub funding. NQ SPARK will

NQ SPARK Feasibility Analysis

create the opportunity for Defence, industry, academia and DSTG to cooperate in enabling innovative solutions to Defence priorities. The University of South Australia, and the University of New South Wales' Defence Research Institute have expressed interest in collaborating with JCU and Defence Industry to jointly support Defence funded projects and initiatives.

This cooperation between Townsville defence industry and select universities provides an opportunity for participation in a Defence Cooperative Research Centre Program (Defence CRC). With the aim of developing next-generation defence and national security technologies, Defence CRCs use program funding to partner with researchers and industry, particularly small to medium sized enterprises. Each Defence CRC develops project proposals based on its priorities and capabilities. It is proposed that NQ SPARK will establish itself as a Simulation and Integrated Soldier Systems Defence CRC.

The increased presence of the Singaporean Armed Forces in the North Queensland region has invigorated interest from Singapore Defence Industry in possible investment opportunities. Consultation with the Austrade Defence representative in Singapore indicates the potential to attract foreign investment within Townsville, along with Australian Government trade investment funds. Business partnerships with Singaporean industry will put weight to the Australia-Singapore CSP, with the ability to open the door to additional Association of Southeast Asian Nations (ASEAN) partners.

4 Need

4.1 Simulation Requirement

Simulation is a rapidly evolving capability amongst industry, government and institutions conducting training, research, and development to enhance effectiveness, reduce cost and mitigate risk. The most likely sectors identified as suitable, and interested to initially (Stage 1) participate in NQ SPARK are:

- Defence industry
- Defence agencies
- Health and clinical training
- Tertiary education institutions
- Emergency services (Police, Fire and Ambulance)
- Mining and offshore oil and gas
- Maritime industry
- Edu-tourism

4.2 User Requirements

Defence industry has multiple, broad requirements to support simulation enabled training activities and research programs. Capabilities will include reconfigurable spaces, an auditorium for after action reviews, recording and research support and advanced visual systems. Many indoor training activities will need multiple methods for attaining and recording outcomes and a means to quickly feedback results to support fidelity and throughput of learning activities.

Defence agencies have similar requirements to defence industry without the emphasis on training. Primary interest is research and development within defence funded projects, and research and validation for capability acquisition programs.

Potential health and clinical training activities within NQ SPARK fall broadly into two categories. JCU conducts simulation enabled training in support of undergraduate degrees in medicine and nursing. The TUH also performs advanced competency and certification for medical staff and annual qualifications and currency in first aid response for all hospital staff. Simulation resources are limited in both quality and quantity, and not specially designed for efficient throughput in training. As a result, both institutions have trouble meeting training demand. Specialised task training could be retained by the university and hospital but access to a proximal facility designed for maximum efficiency will ensure they are able to effectively meet training demand at reduced cost and improved learning outcomes.

In addition to enhancing higher learning outcomes, universities and other tertiary institutions are integrating simulation into research, development, assessment and commercialisation of new technologies and concepts. These applications require complex immersive visualisation, complex tracking processes and data capture applications.

The Queensland Police Service have commissioned a state-of-the-art simulation training facility, the Counter Terrorism and Community Safety Centre, on the Wacol Police Complex in Brisbane. Training will be conducted in collaboration with ambulance and fire and emergency services to consolidate

NQ SPARK Feasibility Analysis

critical incident operational skills and tactics. Unfortunately, this training will only be available to two thirds of QPS members posted within 100 kms of Brisbane.

NQ SPARK will provide the same level of simulation enabled training to emergency services personnel in North Queensland to practice critical skills and enhance interoperability between police, emergency services, the ADF and local disaster coordination centres.

Bridge simulation training is common practice within the maritime industry to familiarise vessel masters and pilots in local ports operations, local navigation, and to practice contingencies and emergencies. All large commercial vessels are required to carry a pilot when entering or leaving the Townsville port due to the risk of pollution from a grounding or collision when transiting the Great Barrier Reef Marine Park. Simulated training in all light and weather conditions improves the skills of local captains and pilots and decreases the risk of an accident or incident.

The Townsville North Queensland Edu-Tourism Consortium delivers world-class study abroad and educational tourism programs in North Queensland. The program brings international students to the region to participate in experiential learning experiences designed by local businesses in the fields of marine and tropical sciences, environmental studies, tourism, and Indigenous heritage. NQ SPARK's immersive visual experience will provide unique learning outcomes for local and international students and tourists.

4.4 Capability Requirements

To meet the identified needs of interested and suitable facility stakeholders, it is proposed that NQ SPARK's A-ESTF will be equipped with the following cutting-edge technology systems and training and research facilities²:

- Semicircular 270-degree LED video wall providing an immersive visual capability within a large operating space up to 12 metres in diameter and 6 metres high. The video wall is segmented to allow it to be broken down into multiple smaller training and research arenas if required.
- Precision motion capture OptiTrack camera system suitable for research in robotics, unmanned aerial systems, movement sciences, virtual reality, and animation.
- Private 4G/5G Long Term Evolution (LTE) Network providing specialised and secure research and data collection.
- Situational training and experimentation space, a large configurable training arena with variable environmental control to support simulated complex tactical emergency training for defence, police, health and other emergency services.
- Clinical simulation centre reconfigurable to support up to four simultaneous resuscitation bays, hospital ward, triage, or trauma training scenarios.
- Command and control decision superiority space to provide collective training for command elements in critical incident, emergency, and disaster management. This capability will be virtually linked to other training spaces in the facility and/or the Local Disaster Coordination Centre to provide simultaneous coordination and decision-making training scenarios for tactical and operational level commanders.
- Large capacity auditorium to deliver briefs, lectures, and training information. The auditorium will also act as a briefing and holding area to expedite throughput during high participation training activities.

² Source: Cubic Defence Australia, James Cook University and Townsville University Hospital

NQ SPARK Feasibility Analysis

- Visiting research space to provide staff from collaborating universities, DSTG, industry partners or research participants who are not locally based with working facilities when using the NQ SPARK or other proximal for training or research.
- Secure data portal to allow NQ SPARK users to capture and transfer research or training data and information with classified, commercial or privacy restrictions.

5 Development Concept

5.1 Overview

NQ SPARK will be developed over 25 years, with stage 1 planned over five years from 2022.

Stage 1 includes the A-ESTF as the enabling infrastructure for the precinct, a 3000 m² commercial building for Cubic Defence Australia as the anchor tenant and several smaller commercial buildings, estimated to be in vicinity of 3,000 m², for foundation industry partners.

With increased utilisation and investment over time, stage two will incorporate an estimated ~7,000 m² of commercial and shared facilities developed through to 2046. Stages 1 and 2 are illustrated in Figure 4.

Figure 4: Proposed NQ Simulation Park (NQ SPARK) Stages 1 and 2



Covering an area of approximately 6 hectares (stages 1 and 2), the optimal location for NQ SPARK is being considered under the TropiQ 25-year masterplan, currently being finalised. The only specific project requirement is that access to the A-ESTF be available through the physical boundary between Lavarack Barracks and JCU. Once the site has been selected, Defence Estate and Infrastructure Group will include NQ Spark into the Lavarack Barracks development masterplan.

The A-ESTF (estimated at \$30 million) and Stage 1 connecting and foundational infrastructure (\$5 million) will be publicly funded, with industry premises financed through commercial debt and long-term lease arrangements. The A-ESTF will be a shared resource operated on a full cost recovery fee-

NQ SPARK Feasibility Analysis

for-service basis. Funding for leased commercial premises will be secured as required, potentially using a NAIF line of credit, to accommodate future NQ SPARK industry investment and participation.

It is proposed that the NAIF will form an integral part of the industry investment attraction and development process for NQ SPARK. Recent changes to NAIF's mandate and eligibility criteria have broadened the scope for NAIF funding, with the opportunity for it to become a valuable tool in supporting the development of defence industry within Northern Australia.

Figure 5: Rendered Representation of the A-ESTF



5.2 A-ESTF Utilisation

The A-ESTF will be staffed by two full time technicians with responsibility for configuration, technical operation, and maintenance oversight. Organisations using the simulation facility will provide instructors and operators or negotiate a support contract for training or research as required.

Initial utilisation is assumed to be 200 days per annum, or approximately 40 weeks per year, based on the following utilisation assumptions:

- Defence and defence agencies 30%
- General research and academia 25%
- Clinical medicine 25%
- Other industry training³ 20%

As demand increases, more sessions and/or days will be allocated, with extra staff engaged as required to meet demand.

Large users will negotiate pre-booked blocks of time, preferably on an annual basis. Allocation will ensure these organisations meet annual qualification and currency training cycles, contract delivery timelines, and requirements to support collaborative projects and research. The remaining availability will be smaller, flexible blocks of time distributed to meet user requirements.

³ Police and Emergency Services including disaster response and coordination, Mining and off-shore drilling, maritime etc.

5.3 Funding Opportunities

Users of the A-ESTF will incur a daily operating cost to cover all expenses associated with the shared facility. Some organisations will incorporate the cost of the facility within commercial contracts and project funding submissions. In other cases, such as clinical, police and emergency services training, these activities are currently conducted in ageing and/or not fit for purpose facilities with upgrades planned to address capability deficiencies. Investing these resources in training time within the A-ESTF will provide specialisation with significant economies of scale efficiencies, and enhanced training outcomes for less than budgeted expenditure.

Participation in government innovation programs can provide access to funding pools to support activities within the NQ SPARK. The Next Generation Technology Fund, valued in 2016 at \$730M through to 2025, is established to fund collaborative research programs. The Defence Science and Technology Group (DSTG) leads this research in partnership with academia, publicly funded research agencies and national and international defence industry. Several opportunities have been identified to apply through DSTG to join existing Defence Cooperative Research Centre's (DCRC) and establish NQ SPARK, in partnership with industry and academia, as an Integrated Soldier Systems DCRC.

The Defence Innovation Hub was established to enhance the ability of Defence, CSIRO, academia, and industry to work collaboratively to accelerate the transfer of innovative technologies into defence capability. The Innovation Hub has a budget of \$640M to also fund activities from 2016 to 2025. NQ SPARK's proximity to established Defence assets and capability, combined with the proposed partnership with defence industry (initially through Cubic Defence Australia), JCU, Uni SA and University of NSW Defence Research Institute, provides substantial justification to qualify for Innovation Hub funding. Both funding pools will be available to NQ SPARK, and/or its participants, with its focused on applied science, research and development and capability development and demonstration.

Opportunities also exist for funding through commercial companies seeking to refine and validate new technology and prototypes. NQ SPARK offers unique capabilities for operational testing including access to a private LTE network and proximity to networked military training ranges.

Private industry investment into NQ SPARK, in the form of long-term leased premises, will occur as demand dictates. This is projected to peak in years one and two, with the development of 3,000 m² for Cubic Defence Australia, followed by a steady state rate of 1,500 m² per annum to accommodate additional industry uptake within the precinct.

As the economics of agglomeration build, industry interest and take-up will increase, with significant potential for NQ SPARK to become an internationally recognised Defence Industry Hub servicing the Indo-Pacific region. Achieving this potential will be transformational for the economies of North Queensland and Northern Australia, while significantly meeting the home security needs of the nation.

5.4 Investment Opportunities

The operation of the A-ESTF is unlikely to offer private investment opportunities. The goal is to provide access to as many users as possible on a whole-of-life full cost recovery basis. However, it intended NQ SPARK will be a physical and conceptual bridge to link defence and government agencies, academia and industry.

The facility will act as a catalyst within TropiQ to bring together all aspects of the capability lifecycle from conception, through development, to manufacture. Investment and business opportunities will

NQ SPARK Feasibility Analysis

become available with the potential for local SMEs to partner with defence industry primes to participate in national and global supply chain opportunities.

5.5 Modernisation

Staying abreast of cutting-edge technology in simulation and research will be critical to future viability and utility of the NQ SPARK. In addition to a comprehensive and timely maintenance program, a strategy is required to address a major limitation of modern technology and software: short lifespans and accelerated obsolescence.

Operating costs must not only include direct running costs, but also provision to fund a rolling technology refresh program. Resources will be allocated as a percentage of capital investment in technology assets within the SPARK. Modernisation program will be funded at the rate of 7%, 7% and 15% over a three-year cycle and repeated for the productive life of the facility. This requirement has been included within the financial modelling for NQ SPARK and the A-ESTF.

6 Governance and Operation

6.1 Ownership and Governance

It is proposed that Ownership and Governance will be exercised through TropiQ, an initiative arising from a commitment in the Townsville City Deal to deliver a Health and Knowledge Strategy for Townsville. TropiQ's Intelligence and Health Precinct is already home to the largest and most diverse grouping of health and knowledge capacity, assets, and expertise in regional Australia.

TropiQ can lever existing physical and intellectual capital, land resource, liveability, and proximity access to Asia and Melanesia to attract private and institutional investment in knowledge based economic activity.

A NQ SPARK Project Leadership Team (PLT) comprising representation from Townsville City Council, James Cook University, the Townsville University Hospital, and subject matter experts from industry, is guiding the project evaluation and Business Case process. The PLT is responsible to the TropiQ Governance Committee.

NQ SPARK will be governed through an independent not-for-profit incorporated entity with Board membership drawn from industry, defence, research and corporate backgrounds. This entity, and in effect the assets it owns and controls, will be a wholly owned by TropiQ as outlined above. Notwithstanding this, NQ SPARK, as a not-for-profit entity will pay no dividends, with any reserves used to further promote and develop NQ SPARK.

It is assumed that an appointed Managing Director, or equivalent position, with relevant experience and understanding of defence, defence industry and training system with a focus on simulated training, will be responsible to the board for planning and daily operations and administration of NQ SPARK.

NQ SPARK Board of Directors will initially include a representative of TropiQ, experienced individuals from defence Industry, partnering universities with expertise in defence research and development, and the precinct Managing Director.

As the precinct diversifies and expands, additional representatives with technical skills and commercial experience may be invited to join the Board.

6.2 Operational Model

The facility will be a not-for-profit commercial enterprise based on user-pays shared services and commercial lease arrangements for industry tenants. The Managing Director will be responsible for the operation of NQ SPARK, including the A-ESTF. Additional support staff will include an administrative officer, with further capacity such as a business development officer, recruited as required.

The A-ESTF will be staffed initially by two qualified technicians. They will be responsible for operation, configuration, administration, and maintenance. Additional instructional and research personnel will be the responsibility of simulation facility users. Utilisation is initially planned at 200 days per year. Further staff will be employed usually to meet surge demand and further full-time positions can be included with future growth in utilisation.

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It is anticipated a large proportion of the utilisation will be pre-booked in blocks of time on an annual basis. Allocation will be determined by the requirement for recurring qualification and currency training and necessary support to contracted projects, training, and funded research opportunities. The remaining available timeslots will provide capacity for ongoing utilisation to meet short notice requirements and accommodate smaller organisations and agencies.

Utilisation charges for the A-ESTF will fund the operating costs, maintenance, and depreciation of the simulation facility. The depreciation schedule includes a significant technology refresh program to ensure software and technology support, state of the art training, research, and development.

Commercial lease agreements with precinct tenants and short-term users will meet ongoing costs and depreciation for the remaining SPARK precinct facilities. Facilities for Cubic Defence Australia are incorporated in Phase 1 construction in recognition of their requirements as the anchor tenant and initial prime user of the simulation facility.

Use of the A-ESTF will not be commercially restricted. Lease arrangements within the precinct will be restricted to uses consistent with the charter for NQ SPARK. The A-ESTF operating system will be equipped with secure portal access to ensure commercial-in-confidence or classified integrity of data generated by facility users.

The findings of a financial analysis of the operation are provided in section 7 below.

7 Financial and Economic Evaluation

7.1 Introduction

Townsville City Council's Future Cities Division (City Economist Office) was tasked with conducting a high-level financial and economic analysis of the proposal to assist in the business case decision process. This section presents the key findings of this study. The full report into the financial viability and economic impact of NQ SPARK is attached at Appendix A.

7.2 Analysis Approach

The assessment of the financial viability and economic impact of NQ SPARK provides:

- A high-level financial appraisal of the project, including profit and loss (P&L), internal rate of return (IRR), net present value (NPV) and Benefit/Cost Ratio (BCR).
- An Economic Impact Assessment (EIA) utilising Input-Output modelling to estimate the direct and flow on impacts of the project during construction and operations.
- An overview of the non-economic benefits generated by the proposal.

7.3 Key Assumptions

The following key assumptions have been made:

- NQ SPARK will be governed by a not-for-profit incorporated entity, wholly owned by TropiQ. NQ SPARK will pay no dividends to TropiQ, with profits and/or reserves used to further promote and develop the precinct.
- Land will be provided by James Cook University, on a long-term lease arrangement (~50 years) on agreed terms.
- The A-ESTF (estimated at \$30m) and Stage 1 trunk and connecting infrastructure (estimated at \$5m) will be funded over 2 years through Federal and Queensland Government grants, respectively, from 2022.
- The A-ESTF will operate on a full cost recovery user pays basis. Initial utilisation is based on 200 days per annum.
- Industry investment, estimated at \$35 million over 17 years, will be funded through a NAIF line of credit drawn down on as demand dictates. Businesses locating within NQ SPARK will do so on full commercial leasing terms.
- A working capital account, estimated to be in the vicinity of \$1.5m, will be established through standard debt arrangements.

7.4 Key findings

Financial Viability

The financial investment analysis estimates that NQ SPARK, over a 25-year period, will generate \$134.4M in operating revenue. This revenue is sufficient to fully fund both the operations and management of the precinct and the operations of the multi-user Advanced Environmental Simulation Training Facility (A-ESTF) estimated at \$114M.

When applying a 7% discount rate, the project results in a positive net present value (NPV) of \$5.9M, a Benefit/Cost Ratio (BCR) of 1.07 and an Internal Rate of Return (IRR) of 15%.

NQ SPARK Feasibility Analysis

Economic Impact

During the period of assessment (2022 – 2046), NQ SPARK will provide significant economic benefits to the Townsville including:

Construction

Based on capital costs of \$72 million, (\$37 million NQ Spark + \$35 million Industry) it is estimated that, during the entire construction phase, that NQ SPARK will generate significant economic impacts for Townsville (SA3), including:



\$184.3 million in output including \$72 million directly



\$71.31 million in Gross Regional Product including \$22.77 million directly



727 Jobs, including 221 direct

Operational

Linking Townsville's Defence, Research and Health capability with national and international defence industry and research organisations, NQ SPARK will facilitate significant industry investment within the precinct. It is estimated that this investment, over the assessed life of NQ SPARK, will have on-going annual economic impacts for Townsville, including:



595 total jobs including 259 direct high paying knowledge intensive service jobs.



\$64.27 million in Gross Regional Product, including \$29.07 million directly



\$131.03 million in output for local businesses, including \$56.04 million directly.

Non-Economic Benefits

Additional non-economic benefits flowing from NQ SPARK include:

- *Strategic alignment to national, state and local policy and planning instruments:* NQ SPARK is consistent and strongly aligned with the following government policy and strategic planning and development initiatives:
 - *Townsville City Deal* - a 15-year Australian, Queensland and Local Government commitment to establish and realise a shared vision for Townsville.
 - *Defence Policy* – the *Defence Strategic Update 2020* and *Force Structure Plan 2020*.
 - *Northern Australia Whitepaper* - a 20-year plan for investment and collaborative support to set priorities to drive growth in Australia's north.
 - *Australia Singapore Comprehensive Strategic Partnership* – a ten year plan (2015-2025) to enhance strategic, trade, economic, defence and people to people links, to

NQ SPARK Feasibility Analysis

deepen collaboration in all areas of bilateral relations and enhance the integration of economies in order to achieve closer economic ties.

- o ***Defence Science and Technology*** – The Department of Defence Science and Technology (DST) provides scientific advice and innovative solutions for Defence and national security.
- o ***Queensland Defence Industries 10-Year Roadmap and Action Plan*** – Queensland’s plan to support growth in the defence sector.
- ***Safety and Cost Efficiency in Training*** - The NQ SPARK will design and deliver tailored, high competency training experiences in a range of complex, dangerous and seldom undertaken tasks. These systems will reduce risk, costs and improve overall performance in diverse areas such as defence, emergency services, health, disaster management, mining and offshore oil and gas.
- ***Defence Veteran Workforce*** - A high number of ex-Defence personnel reside in Townsville and make up a significant and influential component of the local community. This ready veteran workforce retains defence clearances, and many possess highly desirable skills, experience and qualifications.

7.4 Recommendation

Based on the assumptions as outlined, NQ SPARK is financially viable Net Present Value of \$5.9M, a Benefit/Cost Ratio of 1.07 and an Internal Rate of Return of 15%.

The investment and development will generate significant economic impacts for North Queensland and Australia and aligns with numerous Federal State and Local policy objectives. Based on these findings, it is recommended that the proposal proceed to a detailed design and full business case stage.

8. Conclusion

NQ SPARK builds on local expertise in simulation enabled training to develop a unique precinct with flexible, multipurpose applications for advanced training, including an experimentation centre for soldier systems research and development, and human performance studies.

NQ SPARKS foundation will be built on Townsville's expertise in simulation enabled training, centred on Cubic Defence, to establish an A-ESTF. The A-ESTF will be a multi-user facility, used by defence, industry, education, research and health institutions, to deliver large-scale simulation training through the use cutting-edge technology. Users of the facility include:

- Defence (ADF) and Defence agencies
- Defence industry
- Health and clinical practice training
- Tertiary education institutions
- Emergency services (Police, Fire, Ambulance and SES)
- Mining and offshore oil and gas
- Maritime industry

This foundation provides NQ SPARK with the ability to work closely with the Australian Governments Defence Science and Technology Group (DSTG) to facilitate collaborative research and development in emerging and future technologies for the "future Defence Force after next". It has significant potential, under the Defence Cooperative Research Centres program, to become a Cooperative Research Centre (CRC) with a focus on human performance and soldier systems.

This analysis finds that NQ SPARK will be financially viable and will generate significant economic for North Queensland and Australia the project aligns with numerous Federal, State and Local policy and planning objectives.

Based on these findings, it is recommended that the project proceed to full business case.

APPENDICES

Appendix A: NQ SPARK – Financial and Economic Analysis

NQ SPARK

Financial and Economic Analysis

TOWNSVILLE CITY COUNCIL
Future Cities
City Economist Office
September 2020



NQ SPARK Feasibility Analysis

Job Name: NQ SPARK Financial and Economic Analysis

Project Manager: David Lynch

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Disclaimer

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NQ SPARK - FINANCIAL AND ECONOMIC ASSESSMENT

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NQ SPARK - FINANCIAL AND ECONOMIC ASSESSMENT

EXECUTIVE SUMMARY

BACKGROUND

The proposed NQ SPARK will build upon local expertise in simulation enabled training to develop a simulation park (SPARK) with flexible, multipurpose applications for advanced training, including an experimentation centre for soldier systems research and development, and human performance studies.

Townsville City Council's Future Cities Division (City Economist Office) was tasked with conducting a high-level feasibility analysis of the proposal to assist in the business case decision process. This report presents the findings of a study to assess financial viability and economic impact of NQ SPARK as part of the feasibility assessment.

APPROACH

This assessment includes:

- A high-level financial appraisal of the project, including profit and loss (P&L), internal rate of return (IRR), net present value (NPV) and Benefit/Cost Ratio (BCR).
- An Economic Impact Assessment (EIA) utilising Input-Output modelling to estimate the direct and flow on impacts of the project during construction and operations.
- An overview of the non-economic benefits generated by the proposal.

ASSUMPTIONS

The following key assumptions have been made:

- NQ SPARK will be governed by a not-for-profit incorporated entity, wholly owned by TropiQ. NQ SPARK will pay no dividends to TropiQ, with profits and/or reserves used to further promote and develop the precinct.
- Land will be provided by James Cook University, on a long-term lease arrangement (~50 years) on agreed commercial terms.
- The A-ESTF (estimated at \$30m) and Stage 1 trunk and connecting infrastructure (estimated at \$5m) will be funded over 2 years through Federal and Queensland Government grants, respectively, from 2022.
- The A-ESTF will operate on a full cost recovery user pays basis. Initial utilisation is based on 200 days per annum.
- Industry investment, estimated at \$35 million over 17 years, will be funded through a NAIF line of credit drawn down on as demand dictates. Businesses locating within NQ SPARK will do so on full commercial leasing terms.
- A working capital account, estimated to be in the vicinity of \$1.5m, will be established through standard debt arrangements.

KEY FINDINGS

Financial Viability

The financial investment analysis estimates that NQ SPARK, over a 25-year period, will generate \$134.4M in operating revenue. This revenue is sufficient to fully fund both the operations and management of the precinct and the operations of the multi-user Advanced Environmental Simulation Training Facility (A-ESTF) estimated at \$114M.

When applying a 7% discount rate, the project results in a positive net present value (NPV) of \$5.9M, a Benefit/Cost Ratio (BCR) of 1.07 and an Internal Rate of Return (IRR) of 15%.

NQ SPARK Feasibility Analysis

NQ SPARK - FINANCIAL AND ECONOMIC ASSESSMENT

Economic Impact

During the period of assessment (2022 – 2048), NQ SPARK will provide significant economic benefits to the Townsville including:

Construction

Based on capital costs of \$72 million, (\$37 million NQ Spark + \$35 million Industry) it is estimated that, during the entire construction phase, that NQ SPARK will generate significant economic impacts for Townsville (SA3) including:



\$184.3 million in output including \$72 million directly



\$71.31 million in Gross Regional Product including \$22.77 million directly



727 Jobs, including 221 direct

Operational

Linking Townsville's Defence, Research and Health capability with national and international defence industry and research organisations, NQ SPARK will facilitate significant industry investment within the precinct. It is estimated that this investment, over the assessed life of NQ SPARK, will have on-going annual economic impacts for Townsville, including:



585 total jobs including 258 direct high paying knowledge intensive service jobs.



\$64.27 million in Gross Regional Product, including \$29.07 million directly



\$131.03 million in output for local businesses, including \$58.04 million directly.

Non-Economic Benefits

Additional non-economic benefits flowing from NQ SPARK include:

- **Strategic alignment to national, state and local policy and planning instruments:** NQ SPARK is consistent and strongly aligned with the following government policy and strategic planning and development initiatives:
 - **Townsville City Deal** - a 15-year Australian, Queensland and Local Government commitment to establish and realise a shared vision for Townsville.
 - **Defence Policy** – the *Defence Strategic Update 2020* and *Force Structure Plan 2020*.
 - **Northern Australia Whitepaper** - a 20-year plan for investment and collaborative support to set priorities to drive growth in Australia's north.
 - **Australia Singapore Comprehensive Strategic Partnership** – a ten year plan (2015–2025) to enhance strategic, trade, economic, defence and people to people links, to deepen collaboration in all areas of bilateral relations and enhance the integration of economies in order to achieve closer economic ties.
 - **Defence Science and Technology** – The Department of Defence Science and Technology (DST) provides scientific advice and innovative solutions for Defence and national security.
 - **Queensland Defence Industries 10-Year Roadmap and Action Plan** – Queensland's plan to support growth in the defence sector.

NQ SPARK Feasibility Analysis

NQ SPARK - FINANCIAL AND ECONOMIC ASSESSMENT

- *Safety and Cost Efficiency in Training* - The NQ SPARK will design and deliver tailored, high competency training experiences in a range of complex, dangerous and seldom undertaken tasks. These systems will reduce risk, costs and improve overall performance in diverse areas such as defence, emergency services, health, disaster management, mining and offshore oil and gas.
- *Defence Veteran Workforce* - A high number of *ex*-Defence personnel reside in Townsville and make up a significant and influential component of the local community. This ready veteran workforce retains defence clearances, and many possess highly desirable skills, experience and qualifications.

RECOMMENDATION

Based on these findings, it is recommended that the project proceed to a full business case.

NQ SPARK - FINANCIAL AND ECONOMIC ASSESSMENT

1. INTRODUCTION

1.1 BACKGROUND

The Townsville City Deal, Townsville North Queensland Defence Strategy, and Health and Knowledge Development Strategy all recognise the untapped potential for enhanced collaboration between institutions, industries, and governments to drive job creation and economic growth for Townsville. The proposed North Queensland Simulation Park, or 'NQ SPARK', will build upon local expertise in simulation enabled training to develop a simulation precinct with flexible, multipurpose applications for advanced training, including an experimentation centre for research, development, and human performance studies. NQ SPARK will facilitate development of a tech-centric workforce in Townsville for health, Defence industry, and supporting research.

Located on JCU land bordering Lavarack Barracks and in proximity to TUH, NQ SPARK will be the platform linking Townsville's Defence, Research and Health capability with national and international defence industry and research organisations within a collaborative environment focused on researching, developing and testing emerging and future technologies with an initial focus on simulation, human performance and integrated soldier systems.

1.2 PURPOSE OF THIS REPORT

This report provides a high-level Financial and Economic Impact Assessment (EIA) for the NQ SPARK project.

1.3 NQ SPARK DEVELOPMENT OVERVIEW

This section outlines the opportunity, concept and cost estimates for the NQ SPARK development.

1.3.1 Development Opportunity

Defence

Townsville is critical to the defence of our nation. The city's role is evident in the pivotal part played as a forward mounting base for the war in the Pacific (1942 – 45) and for most ADF deployments since. Current defence assets and capabilities located within or in proximity to Townsville include:

- Lavarack Barracks – home to 3 Brigade, 11 Brigade (Reserve) and 2 RAR (Amphibious)
- Ross Island Barracks – Army Maritime
- The Australian Army Combat Training Centre - delivering advanced collective combat training
- Defence Training Areas (Townsville, Greenvale, Mount Stuart, Tully and Cowley Beach FTA's and Rattlesnake Island bombing range)
- RAAF Base Townsville – a jointly operated military/civilian airfield; home to the 5th Aviation Regiment
- Port of Townsville – a deep water port capable of accommodating Australian and allied capital ships
- Established transport and logistics capabilities

Combined – more than one third of the Army's deployable combat capability is housed within Townsville, with the ability to continuously prepare (train and exercise) and rapidly deploy by land, air or sea from a single location to any location within Australia national sphere of interest.

Cubic

Founded in Townsville in 2007, Cubic Defence Australia (Cubic) has grown to be a world-leader, and the ADF's prime contractor, in live, simulated, and augmented training and command and control systems.

From its headquarters in Townsville, Cubic offer training and simulation systems and services, as well as C4ISR solutions, across Australia. Current ADF programs administered by Cubic include:

- The Combat Training Centre (Live Instrumentation System)

NQ SPARK - FINANCIAL AND ECONOMIC ASSESSMENT

- Australian Defence Simulation Training Centre
- Navy Synthetic Warfighting Centre
- Air Combat Maneuvering Instrumentation
- Advanced Training Services (Advanced exercises and specialised advanced training)
- Training Range Technical Services (Range communications and safety network systems)

Research and Development Capability

A central feature of Townsville's economy is the ongoing investment in applied science, research and development services. Major institutions delivering this capability include:

- James Cook University (JCU)
- the Great Barrier Reef Marine Park Authority (GBRMPA)
- the Australian Institute of Marine Science (AIMS)
- the Commonwealth Scientific and Industrial Research Organisation (CSIRO)

These institutions are, on a somewhat ad hoc basis, currently providing defence science research and development services to Defence and the Defence industry generally.

Health

Collocated with JCU and Lavarack Barracks, Townsville University Hospital (TUH) is a tertiary referral hospital treating patients from as far north as the Torres Strait Islands, and west to Mount Isa and the Gulf of Carpentaria. It is also the major teaching hospital for JCU's schools of medicine, nursing and allied health and TAFE North Queensland. TUH is a recognised health research hub, with a state-of-the-art, dedicated research space, on the cutting edge of tropical medicine research with clinical trial partnerships both onsite and via telehealth.

TropiQ

launched in December 2019, TropiQ integrates JCU and TUH operations to create a precinct specialising in Tropical Intelligence and Health. TropiQ is a living laboratory and collaborative ecosystem of over 70 organisations, anchored by JCU, TUH, Lavarack Barracks, the ARC Centre of Excellence and the CSIRO.

Townsville City Deal

The Townsville City Deal (TCD) is a 15-year commitment between the Australian Government, the Queensland Government and Townsville City Council. The TCD establishes a shared vision with the objective of Townsville becoming, by 2030:

- the economic gateway to Asia and Northern Australia
- a global leader in tropical and marine research and innovation
- a prosperous and highly liveable city for residents and visitors.

These objectives are being realised through six enabling initiatives centred on the following themes:

- Capital of North Queensland.
- Innovative and Connected City.
- Port City.
- Industry Powerhouse for the North.
- Defence Hub.
- Enabling Infrastructure.

Commitments under the Innovative and Connected City and Defence Hub initiatives of the TCD, the Queensland Government and Townsville City Council respectively have developed the *Townsville Health and Knowledge Strategy 2020* and *Townsville North Queensland Defence Strategy 2020 - 2030*. Both strategies recognise and

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promote the opportunity for Townsville to combine its strengths in defence and tropical research to establish a thriving defence industry supporting the security of the nation.

Defence Science and Technology Opportunities

The Department of Defence Science and Technology (DST) provides scientific advice and innovative solutions for Defence and national security.

The Next Generation Technology Fund is a forward-looking DST program providing \$730m through to 2026 to facilitate research and development in emerging and future technologies for the "future Defence Force after next".

The Defence Innovation Hub is a virtual network, funded at around \$640 million to 2025/26 to bring together Defence's innovation programs. The Hub enables defence industry to collaborate on innovation efforts that deliver a capability edge throughout the capability life cycle from initial concept, through prototyping and testing to introduction into service.

The opportunity exists, through the establishment of SPARK, for industry and academia to partner in accessing both Next Generation Technology and Defence Innovation Hub funding and to form an "Integrated Soldier Systems Cooperative Research Centre" under the Defence Cooperative Research Centres program.

1.3.2 Development Concept

Located on JCU land bordering Lavarack Barracks and in proximity to TUH, as illustrated in Figure 1, NQ SPARK will be the platform linking Townsville's Defence, Research and Health capability with national and international defence industry and research organisations within a collaborative environment focused on researching, developing and testing emerging and future technologies with an initial focus on simulation, human performance and integrated soldier systems.

Figure 1: NQ SPARK location



With an anticipated development life of 16 years, NQ SPARK will be developed over two stages as illustrated in figure 2.

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Figure 2: NQ SPARK – Development Concept; Stages 1 and 2



Covering an area of approximately 2.5 hectares, Stage 1 (2022 – 2026 inclusive) incorporates the Advanced Environmental Simulation Training Facility (A-ESTF) as the foundation infrastructure for NQ SPARK, a 3000 m² commercial building for Cubic Defence Australia as the anchor tenant and several smaller commercial buildings, estimated to be in vicinity of 3,000 m², for foundation industry partners.

Figure 3: NQ SPARK Stage 1 concept illustration



With increased utilisation and investment over time, stage two, covering the remaining 3.5 hectares, will incorporate a further ~7,000 m² of commercial and shared facilities developed through to 2039.

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1.3.3 Schedule of Works

Table 1 below sets out the proposed schedule of works for NQ SPARK.

Table 1: NQ SPARK Schedule of Works

Construction Expenditure \$000	Yr 1 2021 \$000	Yr 2 2022 \$000	Yr 3 2023 \$000	Yr 4 2024 \$000	Yr 5 2025 \$000	Yr 6 2026 \$000	Yr 7 2027 \$000	Yr 8 2028 \$000	Yr 9 2029 \$000	Yr 10 2030 \$000	Yr 11 2031 \$000	Yr 12 2032 \$000	Yr 13 2033 \$000	Yr 14 2034 \$000	Yr 15 2035 \$000	Yr 16 2037 \$000	Yr 17 2038 \$000	Yr 18 2039 \$000
Stage 1:																		
SPARK	5,000																	
A-ESTF	18,000	12,000																
Cubic - 1		5,000																
Industry 2			3,000															
Industry 3				3,000														
Industry 4					3,000													
Stage 2:																		
Pad expansion					1,000						1,000							
Industry 5						3,000												
Industry 6							3,000											
Industry 7									3,000									
Industry 8											3,000							
Industry 9													3,000					
Industry 10																3,000		
Industry 11																		3,000
Total	23,000	17,000	3,000	3,000	4,000	3,000		3,000		3,000	1,000	3,000		3,000		3,000		3,000

Assumptions used for this schedule are outlined in Section 2.6 below.

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1.3.4 Business Model Assumptions

Ownership and Governance

NQ SPARK will be governed through an independent not-for-profit incorporated entity with Board membership drawn from industry, defence, research and corporate backgrounds. This entity, and in effect the assets it owns and controls, will be a wholly owned by TropiQ. Notwithstanding this, it will pay no dividends, with any reserves used to further promote and develop NQ SPARK.

Funding and Finance

It is proposed that the A-ESTF (\$30m) and Stage 1 trunk and connecting infrastructure (\$5m) will be funded through Federal and Queensland Government grants, respectively.

Industry investment, estimated at \$35 million over 17 years, will be funded through a NAIF line of credit drawn down on as demand dictates.

A working capital account, estimated to be in the vicinity of \$1.5m, will be established through standard debt arrangements.

A detailed financial investment appraisal is provided in Section 2 below.

NQ SPARK - FINANCIAL AND ECONOMIC ASSESSMENT

2. FINANCIAL INVESTMENT APPRAISAL

2.1 CAPITAL COSTS

Table 2 provides an overview of Capital Costs, estimated at \$70 million (refer APPENDIX D).

Table 2: Capital Cost Overview

	Yr 0	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5- Yr18
Capital Investment	2022	2023	2024	2025	2026	2027-2039
	\$300	\$300	\$200	\$000	\$001	
Stage 1: Simulation Park						
Multi-user Advanced Environmental Training Facility (A-ESTF)	18,000	12,000				
Land bitumen pad & access road (Carpark, fencing, access roads & landscaped area)	5,000					
Building 1 (Cubic)		5,000				
Purpose built buildings as per design concept						
Building 2			8,000			
Building 3				8,000		
Building 4					3,000	
Stage 2: Expansion of Simulation Park						
Other facilities built for expansion						21,000

Stage 1 will be constructed over a period of five years from 2022 inclusive. The multi-user Advanced Environmental Training Facility (A-ESTF) and Building 1 (refer APPENDIX D) will be built over the first two years. The remaining industry buildings are estimated to be constructed over the third and fourth year of construction. The site will be a greenfield site and will require access roads, major civil construction, sewerage, water, telecommunications and fencing and other security infrastructure works.

Construction of the A-ESTF is estimated to cost \$30m; \$5m has been estimated for the land bitumen pad and access road (carpark, fencing, access roads and landscaped area); and the estimated costs for Building (1) is around \$5m, with \$3m set aside for Building 2, 3 and 4. Stage 2, expansion of the simulation park, has been forecasted to occur over a 13 year period (2027-2039), additional buildings/facilities are constructed over 2 year intervals over this time horizon (Refer Appendix B, refer 8).

Cost estimates have been derived by Cubic, who have extensive experience in constructing multi-user Advanced Environmental Training Facilities (A-ESTF), and from Townsville City Council's extensive experience in large scale civil construction and building construction works. A quantity surveyor will be engaged in the business case stage to give a more comprehension breakdown of capital costings.

2.2 COST AND REVENUE ESTIMATES

2.2.1 Costs

NQ SPARK's operational expenditure and revenue assumptions have been forecasted over a 25-year period (refer APPENDIX B). The average operating costs of the park (including operating the A-ESTF) is approximately \$4.6M (YR 2-YR 25).

NQ SPARK's costs and revenue estimates have been broken down into the following parts:

- Management and daily operations in SPARK's capacity as a landlord for its commercial tenants (responsibilities for negotiating commercial arrangements/ marketing for the precinct in its entirety; and
- Operations of the multi-user A-ESTF.

Table 3 provides a breakdown of operating costs for NQ SPARK and the A-ESTF

NQ SPARK Feasibility Analysis

NQ SPARK - FINANCIAL AND ECONOMIC ASSESSMENT

Table 3: Operating costs NQ SPARK over the first 5 years (Full Operations starting in 2024)

Period	2022	2023	2024	2025	2026
Financial Year Ending	\$000	\$000	\$000	\$000	\$000
Operating Costs:					
<u>Management and Operations of Overall Park (excluding A-ESTF) - Refer APPENDIX B</u>					
Employee Costs	240	245	346	353	360
Materials & Services					
Maintenance costs - general			195	240	285
Utility Charges			50	51	52
Long-term land lease payment			25	26	26
Insurance			50	51	52
Depreciation		250	375	450	525
Finance Costs (including interest on working capital facility)		136	192	218	260
<u>(A-ESTF) Operating costs -Refer APPENDIX C</u>					
Fixed costs		63	312	318	325
Variable costs			260	265	271
Depreciation on (A-ESTF only)			1,580	1,580	1,580
Total Operating Costs	240	694	3,385	3,552	3,735

2.2.2 Revenue Estimates

Revenue for SPARK is based on two main streams.

- Long-term lease agreements from tenants residing within the precinct; and
- Utilisation of the A-ESTF through tailor designed simulation training suitable for Defence, medical, paramedical, emergency services personnel, mining and petroleum and gas industries. It will also be instrumented sufficiently to act as an experimentation and test centre for research and human performance studies linked to DST funding and the operation of the proposed Integrated Soldier Systems DCRC.

It has been recommended by experts within this field of training that the best operating model is one in which major contributing parties contribute an annual usage fee for an agreed percentage of utilisation for use of the facility. For the purposes of this initial feasibility study the follow table outlines the utilisation level of each major participating partner with regards to the multi-user Advanced Environmental Training Facility (A-ESTF).

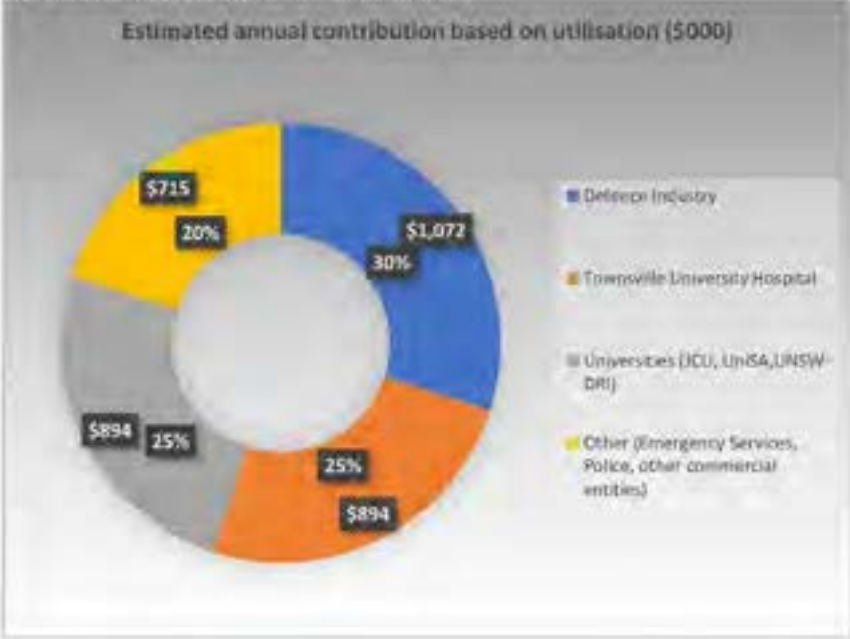
Forecasted annual utilisation of the A-ESTF have been estimated as follows:

Utilisation modelling	%
Defence Industry	30%
Townsville University Hospital	25%
Universities (JCU, UniSA, UNSW-DRI)	25%
Other (Emergency Services, Police, other commercial entities)	20%

Note: this is based on a high-level assessment based on industry consultation. Detailed needs/demand analysis should be completed within the business case phase.

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Figure 4: Estimated utilisation forecast industries.



The global virtual training and simulation market size is estimated at US\$315 billion with a compound annual growth rate of 17%.

Revenue projections for the A-ESTF utilisation have been modelled around utilisation days as forecasted by Cubic. It has been forecasted that the A-ESTF will reach full capacity by year 4 of operations which is 280 days utilised.

2.3 FINANCING

The proposal seeks \$35 million in federal and/or state government assistance to construct the A-ESTF and connecting and trunk infrastructure for Stage 1. Private debt capital, potentially via NAIIF financing, will be sought for the project, estimated at up to a further \$35 million for Stage 1 and 2.

NQ SPARK will operate with an agreed governance system as outlined above and be a commercially viable enterprise based on full fee-for-service arrangement for A-ESTF users and commercial lease arrangements for industry tenants.

The precinct will offer Cubic, as the anchor tenant and foundation capability custodian, a purpose-built premise with long term commercial tenure. Ample space for expansion, access to services and telecommunication connectivity will support participation by collaborating partners and future capability investment within the park.

2.4 PROFIT AND LOSS

The Table 4 below presents a projection of the net operating result for NQ SPARK for the first 3 years of operations (A-ESTF operational YR 2024).

A working capital gap of approximately \$1.5 million will need to be covered over the initial 3 years of operations for the precinct. The analysis suggests NQ SPARK will generate sufficient revenues, totalling \$134.4M once the A-ESTF is operating at design capacity (YR 2028), to cover all recurrent operating costs and maintenance associated with maintaining the general land lord operations of the precinct and the running costs of the multi-user A-ESTF.

NQ SPARK Feasibility Analysis

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Table 4: Net Operating Results

Financial Year Ending	2021 \$000	2022 \$000	2023 \$000	2024 \$000	2025 \$000	2027 \$000
Revenue						
Revenue - Utilization of A-ESTF ¹			1,872	2,334	2,891	3,290
Commercial rent from tenants in precinct ^{2,3}						
Tenant 1			520	831	545	551
Tenant 2				184	189	191
Tenant 3					189	191
Tenant 4						191
Stage 2 - Commercial Rent from tenants (Expansion of Park)					-	-
Capital Funding - State and Federal contributions	21,000	(2,000)				
Residual Value of Precinct (RVN)						
Total Revenue	21,000	11,000	2,392	3,517	3,944	4,222
Operating Costs:						
Employee Costs ⁴	140	141	146	153	160	167
Materials & Services						
Maintenance costs - general ⁴			195	240	289	310
Utility Charges ⁵			50	51	52	53
Long-term land lease payment ^{6,7}			25	24	25	27
Insurance ⁸			50	51	52	53
Depreciation	260	274	274	280	289	300
Finance Costs ⁹ (including interest on working capital facility)	134	191	191	214	260	306
(A-ESTF) Operating costs (Appendix C - Operating costs (A-ESTF))						
Fixed costs	40	312	312	314	325	337
Variable costs			240	240	271	274
Depreciation on (A-ESTF only)			1,580	1,580	1,580	1,580
Total Operating Costs	340	604	3,345	3,557	3,725	4,051
Result:						
Net Position BT	22,760	11,396	(953)	(501)	1087	171
Tax Payable/(Refund)						
Net Position AT	22,760	11,396	(953)	(501)	1087	171

APPENDICES

NQ SPARK - FINANCIAL AND ECONOMIC ASSESSMENT

2.5 ASSUMPTIONS

This section presents key assumptions that underlie the forecasted projections for NQ SPARK. Please refer Investment Analysis and Cash flow Forecast APPENDIX B and C.

Ref	Overarching assumption	Source
Revenue and cost assumptions		
1	Utilisation of the A-ESTF as per section 2.2.2 of report. Figure 2.3 Estimated utilisation forecast for major participating industries (Average contribution based on 30% Defence Industry, 25% for Townsville University Hospital and Universities, 20% Other utilisation).	Cubic Townsville, TCC City Economist
2	Commercial rent estimated to be \$170-\$175/sqm for this precinct. This is based on the estimation of a basic warehouse charged out at \$130/sqm, plus an additional \$30 p/sqm charge would be allocated for landlord's outgoings, totalling \$160 p/sqm gross. However, it was noted that this did not include operating costs, such as cleaning, pest control, electricity, minor maintenance and servicing, etc.)	TCC, Commercial Lease Manager for Property Management, Infrastructure Planning and Assets and Fleet
3	Employee Costs - assumptions based on (2) FTE over the first initial years of operations. Managing Director and Administration Officer.	TCC, City Economist
4	The operating cost for maintenance and upkeep for precinct facilities (excluding the A-ESTF) have been estimated at \$600k once fully operational (1.5% of capital cost incurred).	Townsville City Council, Property Management
	Council has used the rate of 1.5% of the property cost to estimate the value of the operating expenditure each year. Council has deemed this percentage to be accurate based on its previous experience with owning and managing a large portfolio of properties in the LGA.	
5	Estimated utility charges - water, sewerage, waste management charges have been modelled from similar type properties.	TCC, Finance, Property and Rating
6	Estimated lease land payment based on previous estimates used by TCC.	TCC, City Economist
7	Insurance estimate costings have been phased over timeframe of construction, refer APPENDIX B - reference 8.	TCC, Insurance Officer, Finance,
Capital costs		
8	As presented earlier in this report, the estimated capital costs associated with the construction cost estimates have been derived by Cubic who have extensive experience in constructing Multi-user Advanced Environmental Training Facilities (A-ESTF) and Townsville City Council's extensive experience in large scale civil construction and building construction works. A quantity surveyor will be engaged in the business case stage to give a more comprehensive breakdown of capital costings.	Cubic Townsville, TCC
Life-cycle capital Replacement (LCR) (Technology refresh/Operational Assurance upgrades)		
9	In addition to regular repairs and maintenance, major infrastructure assets etc., the A-ESTF will require major operational assurance upgrades. These upgrades have been forecasted in 3 year cycles, starting with the first 2 years at 7% of initial capital costs, and 15% in the third cycle year (please refer APPENDIX B). Please note, the capital costs are calculated only on operational assurance assets pertaining to \$15M out of the \$30M for the A-ESTF as advised by Cubic, Townsville	Cubic, Townsville
Borrowing Costs		
10	An interest rate of 2% over a 20 year time period has been forecasted for draw down of borrowings. Working Capital Facility interest has been forecasted at 1.8% (equivalent to QTC's working capital rate)	TCC, Finance, Commercial Advisory Team
Inflation Rates		
11	Inflation/CPI - operational expenditure has been escalated by 2% to account for the effects of inflation on operating expenditure over the time period selected and annual CPI increase of 2% exercised for commercial rent for lease agreements.	TCC, Finance, Commercial Advisory Team

NQ SPARK - FINANCIAL AND ECONOMIC ASSESSMENT

2.6 NET PRESENT VALUE

Decision Criteria

As per the Building Queensland's Business Case Development Framework¹, the primary decision criteria for economic appraisal of a project will be the Net Present Value (NPV), Benefit Cost Ratio (BCR) and internal rate of return (IRR).

Net present value (NPV) is the difference between the present value of cash inflows and the present value of cash outflows over a period. A positive NPV is desirable.

Benefit Cost Ratio (BCR) The (risk adjusted) BCR divides the present value of estimated benefits by the present value of estimated costs. A ratio of one (1) or more indicates economic viability where the assessed benefits to society are greater than the assessed costs. This ratio is beneficial when comparing projects to invest in.

Internal rate of return (IRR) is a discount rate that makes the net present value (NPV) of all cash flows equal to zero in a discounted cash flow analysis. IRR is calculated using the same concept as NPV, except it sets the NPV equal to zero. IRR is ideal for analysing capital budgeting projects to understand and compare potential rates of annual return over time.

Where the economic appraisal results in a:

- Positive NPV and BCR above 1, the project will be deemed as being desirable
- NPV equal to zero and BCR of 1, the project will be deemed neutral
- Negative NPV and BCR below 1, the project will be deemed undesirable

Table 5 outlines the Present Value (PV) of the identified costs and revenues associated with the project between the financial year ended June 2022 and the financial year ended June 2047 at discount rates of 4%, 7% and 10%.

Table 5: Net Present Value Analysis NQ SPARK

Real Discount Rate	PV Costs (\$M)	PV Benefits (\$M)	NPV (\$M)	BCR %
4%	\$104.54	\$123.71	\$19.18	1.18
7%	\$84.52	\$90.48	\$5.97	1.07
10%	\$71.07	\$70.66	(\$0.40)	0.99

2.7 SENSITIVITY ANALYSIS

A sensitivity analysis has been conducted on the following variables.

- Construction costs
- Variable operating costs
- Revenue Assumptions

Construction - 10% increase in capital costs

Real Discount Rate	PV Costs (\$M)	PV Benefit (\$M)	NPV (\$M)	BCR %
4%	111.05	125.29	14.24	1.13
7%	90.17	91.26	1.09	1.01
10%	78.12	71.05	(5.06)	0.99

NQ SPARK Feasibility Analysis

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Variable operating costs - 10% Increase

Real Discount Rate	PV Costs (\$M)	PV Benefit (\$M)	NPV (\$M)	BCR %
4%	106.94	123.71	16.76	1.16
7%	86.20	90.48	4.29	1.05
10%	72.29	70.66	(1.63)	0.99

Revenue Assumptions - 10% reduction in commercial rent \$/sqm and hourly rate for A-ESTF

Real Discount Rate	PV Costs (\$M)	PV Benefit (\$M)	NPV (\$M)	BCR %
4%	104.54	116.24	11.69	1.11
7%	84.52	85.41	0.89	1.01
10%	71.07	67.07	(4.00)	0.99

This analysis indicates at a real discount rate of 7%, all sensitivity scenario's show a positive NPV and BCR % above 1.

Please note, this sensitivity analysis does not analyse individual yearly cash flows but is a high-level sensitivity analysis. A more comprehensive sensitivity analysis will be conducted in the business case phase.

NQ SPARK - FINANCIAL AND ECONOMIC ASSESSMENT

3. ECONOMIC IMPACT ASSESSMENT

This section presents the findings of economic impact assessment for Townsville Statistical Area 3 (Townsville Local Government Area) for the construction and operation of NQ SPARK. Modeling drivers used in the assessment are described in the Section 3.1. The input-output model used is derived from the local economy microsimulation model developed by the National Institute of Economic and Industry Research (NIER). A description of the Input-Output modelling framework used is provided in Appendix A.

3.1 MODEL DRIVERS

Consistent with the term of the Financial Analysis, the economic contribution of NQ SPARK is assessed over 25 years in the following component parts:

- Construction: \$35 million foundation investment in years 1 and 2 to construct connecting and trunk infrastructure (\$5 million) and the A-ESTF (\$30 million) and \$37 million in industry investment over 16 years from 2023.
- The operational impact of the A-ESTF (from 2024) and additional employment derived from industry investment.

The construction schedule of works is outlined in Table 1 above. Table 6 reports the activity breakdown of capital expenditure used as input to the IO model. Activity is spread across: Non-residential Building Construction, Heavy and Civil Engineering Construction, and Computer Systems Design and Related Services ANZSIC Codes.

Table 6: Construction cost by Input – NQ SPARK

Input	Expenditure \$000
Non-residential Building Construction	50,000
Heavy and Civil Engineering Construction	7,000
Computer Systems Design and Related Services	15,000
Total	72,000

It is assumed that not all inputs will be sourced from within the Townsville economy. Specifically, due to the specialist nature of the industry and the goods and services that it provides, based on advice provided by Cubic Defence, it has been assumed that 50% of the expenditure (cost) on Computer Systems Design and Related Services will be sourced from Townsville businesses using local labour, with the remainder imported into the region.

Operational impacts have been assessed based on:

- A-ESTF revenues as outlined in Table 4. It is assumed that the A-ESTF will consolidate existing simulated training operations across TUH, JCU and other government and industry sectors. Based on this, 60% of estimated revenues is assumed to be new to the region and used as an input to the model.
- Estimated additional employment brought to the region through industry investment as outlined Table 7
- Estimated additional JCU Jobs resulting from the increased in defence science research and development as outlined in Table 8

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NQ SPARK - FINANCIAL AND ECONOMIC ASSESSMENT

Table T: Additional Employment (Jobs) - NQ SPARK

Operational Jobs #	Yr 1 2022 Jobs #	Yr 2 2023 Jobs #	Yr 3 2024 Jobs #	Yr 4 2025 Jobs #	Yr 5 2026 Jobs #	Yr 6 2027 Jobs #	Yr 7 2028 Jobs #	Yr 8 2029 Jobs #	Yr 9 2030 Jobs #	Yr 10 2031 Jobs #	Yr 11 2032 Jobs #	Yr 12 2033 Jobs #	Yr 13 2034 Jobs #	Yr 14 2035 Jobs #	Yr 15 2036 Jobs #	Yr 16 2037 Jobs #	Yr 17 2038 Jobs #	Yr 18 2039 Jobs #	Yr 19 2040 Jobs #	Yr 20 2041 Jobs #	Yr 21 2042 Jobs #	Yr 22 2043 Jobs #	Yr 23 2044 Jobs #	Yr 24 2045 Jobs #	Yr 25 2046 Jobs #
Stage 1																									
SPARK	15	5	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
A-ESTF	1	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cubic - 1	0	5	1	1	1	1	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
DSTG	0	0	1	0	0	1	0	0	0	0	1	0	0	0	0	1	0	0	0	0	1	0	0	0	0
Industry 2	0	0	10	1	1	1	1	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0
Industry 3	0	0	0	10	1	1	1	1	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
Industry 4	0	0	0	0	10	1	1	1	1	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0
Stage 2																									
Industry 5	0	0	0	0	0	10	1	1	1	1	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
Industry 6	0	0	0	0	0	0	0	10	1	1	1	1	0	1	0	1	0	1	0	1	0	1	0	1	0
Industry 7	0	0	0	0	0	0	0	0	0	10	1	1	1	1	0	1	0	1	0	1	0	1	0	1	0
Industry 8	0	0	0	0	0	0	0	0	0	0	0	10	1	1	1	1	0	1	0	1	0	1	0	1	0
Industry 9	0	0	0	0	0	0	0	0	0	0	0	0	10	1	1	1	1	1	0	1	0	1	0	1	0
Industry 10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	1	1	1	1	1	0	1	0	1	0
Industry 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	1	1	1	1	1	0	1	0
Totals																									
Yr additional	2.5	8.5	13	12	13	16	5	14	6	14	6	14	6	14	7	15	8	14	9	4	10	3	9	2	9
Cumulative	2.5	9	22	34	47	63	68	82	88	102	108	122	128	142	149	164	172	186	195	199	209	212	220	222	231

Table B: Additional Employment (Jobs) - JCU

JCU Defence Research Jobs #	Yr 1 2022 Jobs #	Yr 2 2023 Jobs #	Yr 3 2024 Jobs #	Yr 4 2025 Jobs #	Yr 5 2026 Jobs #	Yr 6 2027 Jobs #	Yr 7 2028 Jobs #	Yr 8 2029 Jobs #	Yr 9 2030 Jobs #	Yr 10 2031 Jobs #	Yr 11 2032 Jobs #	Yr 12 2033 Jobs #	Yr 13 2034 Jobs #	Yr 14 2035 Jobs #	Yr 15 2036 Jobs #	Yr 16 2037 Jobs #	Yr 17 2038 Jobs #	Yr 18 2039 Jobs #	Yr 19 2040 Jobs #	Yr 20 2041 Jobs #	Yr 21 2042 Jobs #	Yr 22 2043 Jobs #	Yr 23 2044 Jobs #	Yr 24 2045 Jobs #	Yr 25 2046 Jobs #
Year #	0	0	3	2	2	2	0	2	0	2	0	2	0	2	0	2	0	2	0	2	0	2	0	2	0
Cumulative Total	0	0	3	5	7	9	9	11	11	13	13	15	15	17	17	19	19	21	21	23	23	25	25	27	27

Using these input assumptions, Table B outlines the modelled estimates for construction, operational and total economic impacts by year for the NQ SPARK for the period 2022 - 2046.

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3.2 MODELLING RESULTS

Table 9: Estimated Economic Impacts by Year – MQ SPARK 2022 - 2046

	Yr 1 2022	Yr 2 2023	Yr 3 2024	Yr 4 2025	Yr 5 2026	Yr 6 2027	Yr 7 2028	Yr 8 2029	Yr 9 2030	Yr 10 2031	Yr 11 2032	Yr 12 2033	Yr 13 2034	Yr 14 2035	Yr 15 2036	Yr 16 2037	Yr 17 2038	Yr 18 2039	Yr 19 2040	Yr 20 2041	Yr 21 2042	Yr 22 2043	Yr 23 2044	Yr 24 2045	Yr 25 2046
Construction																									
Output (Direct) \$m	23.00	17.00	3.00	3.00	4.00	3.00	0.00	3.00	0.00	3.00	1.00	3.00	0.00	3.00	0.00	3.00	0.00	3.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Output (Indirect) \$m	37.22	21.61	4.99	4.99	6.65	4.99	0.00	4.99	0.00	4.99	1.72	4.99	0.00	4.99	0.00	4.99	0.00	4.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Output (Total) \$m	60.22	38.61	7.99	7.99	10.65	7.99	0.00	7.99	0.00	7.99	2.72	7.99	0.00	7.99	0.00	7.99	0.00	7.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Jobs (Direct) #	68	78	7	7	9	7	0	7	0	7	3	7	0	7	0	7	0	7	0	0	0	0	0	0	0
Jobs (Indirect) #	198	91	20	20	26	20	0	30	0	20	7	21	0	21	0	21	0	21	0	0	0	0	0	0	0
Jobs (Total) #	266	169	27	27	35	27	0	27	0	27	10	28	0	28	0	28	0	28	0	0	0	0	0	0	0
Value-added (Direct) \$m	6.96	8.55	0.67	0.67	0.89	0.67	0.00	0.67	0.00	0.67	0.34	0.67	0.00	0.67	0.00	0.67	0.00	0.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Value-added (Indirect) \$m	16.46	9.62	2.30	2.30	2.80	2.10	0.00	2.10	0.00	2.10	0.76	2.10	0.00	2.10	0.00	2.10	0.00	2.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Value-added (Total) \$m	23.42	18.17	2.97	2.97	3.69	2.77	0.00	2.77	0.00	2.77	1.10	2.77	0.00	2.77	0.00	2.77	0.00	2.77	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Operational																									
Output (Direct) \$m	0.62	3.05	5.38	8.43	9.69	15.45	16.78	20.27	21.58	25.08	26.42	29.93	31.28	34.77	36.34	40.07	41.87	45.39	47.38	48.40	50.64	51.43	53.45	54.02	56.04
Output (Indirect) \$m	0.87	2.72	7.28	11.47	12.48	21.31	22.77	27.53	29.01	33.95	35.70	40.46	42.20	46.98	48.01	54.08	56.41	61.17	63.79	65.10	66.01	69.03	71.85	72.98	74.99
Output (Total) \$m	1.49	4.77	12.66	19.90	22.17	36.96	39.55	47.80	50.59	59.03	62.12	70.39	73.48	81.75	85.35	94.15	98.28	106.53	111.17	113.50	118.65	120.46	125.30	126.40	131.03
Jobs (Direct) #	3	6	25	39	54	72	77	93	99	115	121	137	143	159	166	183	191	207	216	222	232	237	246	250	259
Jobs (Indirect) #	5	13	32	52	55	96	94	124	130	152	160	180	188	210	219	242	252	278	284	291	304	308	321	324	336
Jobs (Total) #	7	22	57	91	109	168	171	217	229	267	281	317	331	369	385	425	443	486	500	513	536	545	567	574	595
Value-added (Direct) \$m	0.34	1.12	2.87	4.48	5.00	8.27	8.83	10.67	11.34	13.17	13.85	15.68	16.36	18.20	18.99	20.93	21.84	23.67	24.68	25.21	26.33	26.74	27.76	28.05	29.07
Value-added (Indirect) \$m	0.40	1.36	3.42	5.36	5.84	10.00	10.18	12.83	13.69	15.91	16.75	19.00	19.82	22.06	23.01	25.39	26.48	28.72	29.84	30.56	31.92	32.41	33.63	33.96	35.20
Value-added (Total) \$m	0.74	2.50	6.29	9.86	10.84	18.27	19.02	23.60	25.03	29.10	30.60	34.68	36.18	40.26	42.00	46.32	48.32	52.39	54.62	55.77	58.25	59.15	61.39	62.01	64.27
Total - Townsville																									
Output (Direct) \$m	23.62	19.05	8.38	11.43	13.69	16.95	16.78	23.27	21.58	28.08	27.42	32.93	31.28	37.77	36.34	43.07	41.87	48.36	47.38	48.40	50.64	51.43	53.45	54.02	56.04
Output (Total) \$m	61.71	43.58	20.65	27.89	32.82	44.95	39.55	55.79	50.59	67.02	64.84	78.38	73.48	89.74	85.35	102.14	98.28	114.52	113.17	113.50	118.65	120.46	125.30	126.40	131.03
Jobs (Direct) #	71	87	32	46	63	79	77	100	99	122	124	144	143	166	166	190	191	214	216	222	232	237	246	250	259
Jobs (Total) #	273	193	84	118	144	195	171	244	229	294	291	345	331	397	385	453	443	508	500	513	536	545	567	574	595
Value-added (Direct) \$m	7.30	9.67	3.54	5.15	5.89	8.94	8.83	11.34	11.34	13.84	14.19	16.35	16.36	18.87	18.99	21.60	21.84	24.34	24.68	25.21	26.33	26.74	27.76	28.05	29.07
Value-added (Total) \$m	24.16	20.67	9.06	12.63	14.53	21.94	19.02	26.37	25.03	31.87	31.70	37.45	36.18	43.03	42.00	48.09	48.32	55.16	54.62	55.77	58.25	59.15	61.39	62.01	64.27
Rest of Australia																									
Jobs (Total) #	52	49	23	34	39	45	46	65	59	82	80	83	87	105	98	120	115	135	131	132	138	141	145	146	151
Value-added (Total) \$m	7.83	6.36	3.22	4.46	5.25	6.87	6.20	8.75	7.95	10.61	10.37	12.38	11.51	14.16	13.38	16.11	15.39	18.05	17.44	18.03	18.60	18.86	19.58	21.81	20.51

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3.3 KEY FINDINGS

During the period of assessment (2021 – 2046), NQ SPARK will provide significant benefits to the Townsville economy including:

Construction

Based on capital costs of \$72 million, (\$37 million NQ Spark + \$35 million Industry) it is estimated that, during the entire construction phase, that NQ SPARK will generate significant economic impacts for Townsville, including:



\$184.3 million in output including \$72 million directly



\$71.31 million in Gross Regional Product including \$22.77 million directly



727 Jobs, including 221 direct

Operational

Linking Townsville's Defence, Research and Health capability with national and international defence industry and research organisations, NQ SPARK will facilitate significant industry investment within the precinct. It is estimated that this investment, over the assessed life of NQ SPARK, will have on-going annual economic impacts for Townsville, including:



595 total jobs including 259 direct high paying knowledge intensive service jobs



\$64.27 million in Gross Regional Product, including \$29.07 million directly



\$131.03 million in output for local businesses, including \$56.04 million directly

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3.4 NON-ECONOMIC BENEFITS

3.4.1 Strategic Policy Alignment

SPARK is consistent and strongly aligned with the following government policy and strategic planning and development initiatives:

- **Townsville City Deal** - a 15-year commitment between the Australian Government, the Queensland Government and Townsville City Council to establish a shared vision for Townsville's development. Inter alia, the TCD aims to develop Townsville as a Defence Hub.
- **Defence Policy** – the *Defence Strategic Update 2020* identifies the need for a strong, sustainable, and secure Australian defence industry supporting leading edge national innovation. The *Force Structure Plan 2020* acknowledges training and simulation as being critical to prepare Defence for the range of mission scenarios, and the need to develop the cutting-edge technology. The plan details defence investment in training areas and facilities, live and simulated, and simulation software and technology refreshes as being central to force preparation.
- **Northern Australia Whitepaper** - a 20-year plan for investment and collaborative support to set priorities to drive growth in Australia's north.
- **Australia Singapore Comprehensive Strategic Partnership** – building on the Australia Singapore Military Training Initiative (ASMTI), NQ SPARK could host joint Australia/Singapore research and attract Singaporean Defence Industry investment.
- **Defence Science and Technology** – The opportunity exists, through the establishment of NQ SPARK, for industry and academia to partner in accessing both Next Generation Technology and Defence Innovation Hub funding and to form an "Integrated Soldier Systems Cooperative Research Centre" under the Defence Cooperative Research Centres program.
- **Queensland Defence Industries 10-Year Roadmap and Action Plan** – Queensland's plan to support growth in the defence sector.

3.4.2 Safety & Cost Efficiencies in Training

The NQ SPARK will design and deliver tailored, high competency training experiences in a range of complex, dangerous and seldom undertaken tasks. These systems will reduce risk, costs and improve overall performance in diverse areas such as defence, emergency services, health, disaster management, mining and offshore oil and gas.

3.4.3 Defence Veteran Workforce

A high number of ex-Defence personnel reside in Townsville and make up a significant and influential component of the local community. This ready veteran workforce retains defence clearances, and many possess highly desirable skills, experience and qualifications.

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4. CONCLUSION

The proposed NQ SPARK will build upon local expertise in simulation enabled training to develop a simulation park (SPARK) with flexible, multipurpose applications for advanced training, including an experimentation centre for soldier systems research and development, and human performance studies.

Townsville City Council's Future Cities Division was asked to conduct a high-level feasibility analysis of the proposal to assist in the business case decision making process. This report presents the findings of a study to assess financial viability and economic impact of NQ SPARK as part of the feasibility assessment.

The financial investment analysis estimates that NQ SPARK, over a 25-year period, will generate \$134.4M in operating revenue. This revenue is sufficient to fully fund both the operations and management of the precinct and the operations of the multi-user Advanced Environmental Simulation Training Facility (A-ESTF) estimated at \$114M.

When applying a 7% discount rate, the project results in a positive net present value (NPV) of \$5.9M, a Benefit/Cost Ratio (BCR) of 1.07 and an Internal Rate of Return (IRR) of 15%.

The economic impact assessment determined that NQ SPARK will generate significant economic benefits for Townsville including 1,322 direct and indirect jobs (sum of total construction and operational) and contribute \$135.8 million to Gross Regional Product.

Additionally, there are several intangible benefits to developing NQ SPARK including but not limited to:

- Strategic alignment to national, state and local policy and planning instruments
- Improved training performance with reduced risk and cost
- Active engagement of Defence Veteran personnel capitalising on existing skills, experience and qualifications, while reducing veteran health risk.

Based on these findings, it is recommended that the project proceed to a full business case.

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APPENDIX A: INPUT-OUTPUT METHODOLOGY

This analysis uses Input Output (IO) modelling to measure changes resulting from economic impacts. The IO model used is derived from the local economy microsimulation model developed by the National Institute of Economic and Industry Research National Institute of Economic and Industry Research.

INPUT-OUTPUT MODEL OVERVIEW¹

Input-Output analysis demonstrates inter-industry relationships in an economy, depicting how the output of one industry is purchased by other industries, households, the government and external parties (i.e. exports), as well as expenditure on other factors of production such as labour, capital and imports. Input-Output analysis shows the direct and indirect (flow-on) effects of one sector on other sectors and the general economy. As such, Input-Output modelling can be used to demonstrate the economic contribution of a sector on the overall economy and how much the economy relies on this sector or to examine a change in final demand of any one sector and the resultant change in activity of its supporting sectors.

The economic contribution can be traced through the economic system via:

- **Initial stimulus (direct) impacts**, which represent the economic activity of the industry directly experiencing the stimulus.
- **Flow-on impacts**, which are disaggregated to:
 - **Production induced effects (type I flow-on)**, which comprise the effects from:
 - Direct expenditure on goods and services by the industry experiencing the stimulus (direct suppliers to the industry), known as the first round or direct requirements effects.
 - The second and subsequent round effects of increased purchases by suppliers in response to increased sales, known as the industry support effects.
 - **Household consumption effects (type II flow-on)**, which represent the consumption induced activity from additional household expenditure on goods and services resulting from additional wages and salaries being paid within the economic system.

These effects can be identified through the examination of four types of impacts:

- **Output:** Refers to the gross value of goods and services transacted, including the costs of goods and services used in the development and provision of the final product. Output typically overstates the economic impacts as it counts all goods and services used in one stage of production as an input to later stages of production, hence counting their contribution more than once.
- **Gross product:** Refers to the value of output after deducting the cost of goods and services inputs in the production process. Gross product (e.g., Gross Regional Product) defines a true net economic contribution and is subsequently the preferred measure for assessing economic impacts.
- **Employment:** Refers to the part-time and full-time employment positions generated by the economic shock, both directly and indirectly through flow-on activity, and is expressed in terms of full time equivalent (FTE) positions.

Important assumptions in the practical application of input-output modelling include:

- Fixed production coefficients, which imply constant returns to scale; that is to say that if we wanted to double output of sector j, we would have to double all of its inputs with no evidence of scale economies;
- Regional performance matches State average performance;
- Model makes no consideration for change in technology over time. This needs to be considered in long-term forecasting.

¹ AEC Group 2020

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- Homogeneity - where it is assumed that each industry sector produces a fixed set of products that are not produced by any other sector ...while it is possible to have some overlap e.g. liquor sold in hotels (the Retail sector) and in cafes (the Accommodation and Food services sector) ...such an assumption does not appear to be too far away from reality and should not inhibit the validity of the model to any great extent;
- No supply constraints and that the intermediate and household sectors will be able to service any increases in final demand. This assumption could weaken the predictive capacity of the model in those cases where increases in overall demand could bring about factor shortages and raise their prices in the short term.

APPENDIX B: INVESTMENT ANALYSIS APPRAISAL

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APPENDIX C: INVESTMENT ANALYSIS A-ESTF ONLY

Financial Year Ending	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046
	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000
Revenue																										
Revenue - Utilisation of A-ESTF ¹																										
Utilisation % by major contributing partners based on utilisation agreement																										
Defence Industry	30%	1,300		562	700	831	927	940	965	984	1,009	1,034	1,044	1,065	1,080	1,108	1,130	1,153	1,170	1,199	1,223	1,248	1,271	1,298	1,324	1,351
Townsville University Hospital	25%	1,300		468	583	730	773	788	804	820	836	853	870	887	905	923	942	961	980	999	1,019	1,040	1,061	1,082	1,103	1,125
Universities (JCU, UWSA, UNSW-QR)	25%	1,300		468	583	730	773	788	804	820	836	853	870	887	905	923	942	961	980	999	1,019	1,040	1,061	1,082	1,103	1,125
Other (Emergency Services, Police, other commercial entities)	20%	1,300		374	467	584	618	630	643	650	669	682	696	710	724	739	755	768	784	800	816	832	848	865	883	900
	100%																									
Capital Funding - State and Federal contributions		18,000	12,000																							
Total Revenue		18,000	12,000	1,872	2,314	2,921	3,290	3,352	3,215	3,279	3,345	3,412	3,480	3,550	3,621	3,693	3,767	3,842	3,919	3,998	4,078	4,159	4,241	4,327	4,404	4,502
Operating Costs:																										
Fixed Costs:																										
Employee Costs ²			83	252	257	262	333	401	408	416	426	434	443	452	461	470	480	489	499	509	519	529	540	550	562	571
Property expenses	\$20	3,000		60	61	62	64	65	66	68	69	70	72	73	75	76	78	79	81	82	84	85	87	89	91	93
Variable Costs:																										
Maintenance & Upkeep				200	204	208	211	216	221	225	230	234	239	244	249	254	259	264	269	275	280	286	291	297	303	309
Supplies (Consumables)				10	10	10	11	11	11	11	11	12	12	12	12	13	13	13	13	14	14	14	15	15	15	15
Electricity				50	51	52	53	54	55	56	57	59	60	61	62	63	65	66	67	69	70	71	73	74	76	77
Depreciation				1,580	1,580	1,580	1,580	1,580	1,580	1,580	1,580	1,580	1,580	1,580	1,580	1,580	1,580	1,580	1,580	1,580	1,580	1,580	1,580	1,580	1,580	1,580
Finance Costs ** includes interest & principal repayments (https://inf.gov.au) (via SPARK will draw down loan)																										
Total Operating Costs		0	83	2,152	2,163	2,175	2,313	2,328	2,343	2,358	2,373	2,389	2,405	2,422	2,439	2,456	2,474	2,491	2,510	2,528	2,547	2,567	2,586	2,606	2,627	2,648
Result:																										
Net Profit BT		18,000	11,917	(280)	176	746	777	824	872	921	972	1,023	1,075	1,128	1,182	1,237	1,293	1,351	1,410	1,469	1,530	1,593	1,656	1,721	1,787	1,854
Tax Payable (Refund)																										
Net Profit AT		18,000	11,917	(280)	176	746	777	824	872	921	972	1,023	1,075	1,128	1,182	1,237	1,293	1,351	1,410	1,469	1,530	1,593	1,656	1,721	1,787	1,854
Capital Investment:																										
Stage 1: Simulation Park																										
Multi-user Advanced Environmental Training Facility (A-ESTF)		18,000	12,000																							
Total Cumulative Costs		18,000	12,000																							
Total Cumulative Costs for A-ESTF		18,000	12,000																							
Lifecycle capital replacement Costs (LOR)							1,050	1,050	2,250	1,050	1,050	2,250	1,050	1,050	2,250	1,050	1,050	2,250	1,050	1,050	2,250	1,050	1,050	2,250	1,050	1,050
*Technology Refresh Program Operational Assurance Only																										

Assumptions/Notes

1. Utilisation of the A-ESTF as per section 2.2.2 of report. Figure 2.3 Estimated utilisation forecast for major participating Industries. Please note, in the first year of operations the facility estimated to be operating at only 50% or 180 days.
2. Employees cost - (2) FTE's, Technicians. Additional (1) FTE for a Technician once the facility reaches 280 days capacity.
3. The operating cost for a \$30m Multi-user Advanced Environmental Training Facility (A-ESTF) as advised by Cubix

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APPENDIX C: STAKEHOLDER ENGAGEMENT

Face to face and telephone consultations were held by TCC with a small section of stakeholders involved in the proposal of a North Queensland Simulation Park in Townsville, North Queensland. Those consulted at the time of writing are highlighted in the following table.

Table C.1. Stakeholder Organisation, Consultee and Position

Organization	Consultee	Position
Cubic	Mark Horn	Director Strategic Development Australian and New Zealand
Townsville City Council	Tony Isaac	Commercial Lease Manager – Property Management
	Mark Grieve	Senior Property and Billing Officer
	Linda Horton	Insurance Officer, Finance
	David Burke	Defence Engagement Officer

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APPENDIX D: CONCEPT DESIGN MAP

