

QUANTUM NUMBERS CORP.

Interim Management Discussion and Analysis

As at September 30, 2019

QUANTUM NUMBERS CORP.

1. **SCOPE OF MANAGEMENT'S FINANCIAL ANALYSIS**

The following analysis should be read in conjunction with the annual financial statements, including accompanying notes, of Quantum Numbers Corp. ("the Company") for the year ended December 31, 2018. The unaudited condensed interim financial statements for the quarter ended September 30, 2019, including comparative figures, have been prepared in accordance with IFRS applicable to the preparation of interim financial statements, including IAS 34, *Interim Financial Reporting*. All amounts are in Canadian dollars unless otherwise indicated.

1.1 **FORWARD LOOKING STATEMENTS**

The sections of this management discussion and analysis ("MD&A") on the Company's strategy and action plan, its intellectual properties, development and financial reporting reflecting management's current expectations contain "forward-looking statements." Such statements should be understood in context, particularly statements that reflect the Company's opinions, estimates and expectations about future events or results. Such forward-looking statements are subject to certain factors and involve some risks and uncertainties. There can be no assurance that such statements will prove to be accurate. Factors that could cause future results, activities and events to differ materially from those expressed or implied by such forward-looking statements include, but not limited to, possibility or not to obtain the patent, time required to obtain such patent, risks inherent in the hi-tech industry, and the time it will take for the industry to be ready to move to quantic solutions. These risks and uncertainties are described in this MD&A and also the annual information form filed on SEDAR.

1.2 **INCORPORATION, NATURE OF OPERATIONS AND GOING CONCERN**

Quantum Numbers Corp. (the "Company" or "Quantum") was incorporated under the *Business Corporations Act* of Ontario on July 19, 2007.

The head office, principal address and records office of the Company are located at 3755 E Blvd Matte, suite 201, Brossard, Québec, J4Y 2P4. The Company is a developer of a new generation of cryptographic solutions pursuant to the acquisition of intellectual property.

The business of technology involves a high degree of risk and there can be no assurance that projects under research and development will proceed through to achieve commercialization. Risks related to the value of the Company's intangible assets, completing proof of concept studies, protecting intellectual property rights, the ability of the Company to raise alternative financing, and risks inherent to new technologies, such as risk of obsolescence, slow adoption and competing technological advances. Changes in future conditions could require material impairment of investments.

These financial statements have been prepared in accordance with International Financial Reporting Standards ("IFRS") on a going concern basis, which contemplates that the Company will be able to realize its assets and discharge its liabilities in the normal course of business.

Management routinely plans future activities including forecasting cash flows. Management has reviewed their plan with the Directors and has collectively formed a judgment that the Company has adequate resources to continue as a going concern for the foreseeable future, which Management and the Directors have defined as being at least the next 12 months.

The Company intends to patent its technologies wherever it is required. In the meantime, to ensure sufficient cash flow until market readiness, the Company is looking at M&A transactions to achieve its objectives.

1.3 CHANGES IN SIGNIFICANT ACCOUNTING POLICES

These interim condensed financial statements were prepared in accordance with standard IAS 34 - Interim Financial Reporting and do not include all of the information required for a full set of financial statements prepared in accordance with International Financial Reporting Standards ("IFRS"). They, however, include specific complimentary notes in order to provide information necessary to assess the financial situation of the Company at period end since its last annual financial statements dated December 31, 2018.

Except for the changes below, the accounting policies used to prepare these interim unaudited condensed financial statements are those described in the last annual financial statements of the Company and have been applied throughout the period unless otherwise stated. Changes to significant accounting policies are described hereinafter.

IFRS 16 Leases

In January 2016, the IASB published IFRS 16 which replaces IAS 17 Leases. IFRS 16 eliminates the classification as an operating lease and requires lessees to recognize a right-of-use asset and a lease liability in the statements of financial position for all leases with exemptions permitted for short-term leases and leases of low value assets. In addition, IFRS 16 changes the definition of a lease; sets requirements on how to account for the asset and liability, including complexities such as non-lease elements, variable lease payments and options periods; changes the accounting for sale and leaseback arrangements; largely retains IAS 17's approach to lessor accounting and introduces new disclosure requirements. The Company adopted IFRS 16 on January 1, 2019. There was no material impact from its adoption.

1.4 COMPANY OVERVIEW AND STRATEGY

On August 3, 2016, the Company entered into an Intellectual Property Assignment Agreement with Société de Commercialisation des Produits de la recherche appliquée SOCPRA Sciences et Génie SEC ("SOCPRA") and its inventors by issuing a total of 6,000,000 common shares of the Company at a fair value of \$0.05 per share, representing a total fair value of \$300,000. The Company also reimbursed \$13,838 to SOCPRA for the professional fees associated with the protection of the patent ("Acquisition").

Until the expiry of the last patent rights, the Company will pay to SOCPRA a royalty of 5% calculated on the net sales price of products sold by the Company. The royalty shall be calculated on a 12-month basis starting on the effective date and shall be paid by the Company to SOCPRA within 90 days following the expiry of each reference year. The Company may decide, during the three years following the closing date, to pay SOCPRA an amount of \$1,500,000 or, at SOCPRA's option, to issue to SOCPRA 10,000,000 common shares of the Company. In such case, any further royalties will cease to be due and SOCPRA shall not be entitled to any further payment from the Company in consideration for the intellectual property. If the Company does not find or develop a commercial application within three years, 50% of the intellectual property shall be transferred back to SOCPRA.

The Acquisition was not considered to be a business combination and was accounted for as an asset acquisition. Total purchase price of \$300,000, finder's fees of \$30,000 and transaction costs of \$116,112, which includes the reimbursement of \$13,838 above, totalling \$446,112, were capitalized to intellectual property.

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1.4 COMPANY OVERVIEW AND STRATEGY (Continued)

INTELLECTUAL ACTIVITIES

Since Quantum Numbers Corp. changed to quantum hi-tech Intellectual Property, the primary management objective was to strengthen the Company in the following three sectors of activities:

Technology

In order to stay focused on our primary objective, which is to make our technology accessible as rapidly as possible to potential clients and partners, and secured regarding its effectiveness and ensuring that the Intellectual Property is well protected, we are closely working with l'École de Technologie Supérieure ("ÉTS") in order to maximize the potentiality and security of our Technology.

In regards of our second technology "Method and System for creating a Random Bit Sample", this technology is a method that quantifies the randomness of our signal, a perfect complement of our first technology.

Patent

As the Company must obtain its Patent to pass the introduction level with potentials clients, it was then decided to work with the Company's Patent Agent to assess the patentability of our technology. The Company received the final report that indicates that it should continue the National Phase as planned. By doing the legwork and research at the stage of the patentability report, the Company was able to answer rapidly to the EC investigator. Furthermore, that research also allowed us to develop a second Patent that the Company filed under a Patent Cooperation Treaty ("PCT") for the moment.

1.4 COMPANY OVERVIEW AND STRATEGY (Continued)

Status of patents

First Request Method for generating random numbers and associated random number generator

<u>Country</u>	<u>Status</u>
United States	Patent granted. A partial Patent was granted on August 7, 2018. The second portion was granted on October 8, 2019.
Russia	Patent granted on January 16, 2019.
European Patent Office	The EPO issued, on November 13, 2019, the following new entry in our file " Communication of intention to grant a patent EP EP3140818 ". This entry means that over the next few weeks, the Company will receive the actual Notice to grant a patent. After some administrative work, the actual Patent will be issued to the Company.
Canada Republic of Korea New Zealand	The deadline to request an examination report is May 8, 2020, for these three countries.
Thailand	The deadline to request an examination report is November 15, 2022.
Australia Brazil Indonesia India Vietnam	For all these countries, we requested the examination, and we are awaiting the examiner's response.
China	The first examiner comments we addressed on July 5, 2019. We are awaiting the examiner's response

Second Request Method and system for generating a random bit sample

<u>Country</u>	<u>Status</u>
European Patent Office	EPO granted the Patent on October 23, 2019, and the dispute period for all the countries will end on July 23, 2020.
United States	Patent granted. The first patent was granted on February 1st, 2019. The notice of allowance of the second patent was issued in July 2019.
All countries covered under the Patent Cooperation Treaty	National phase entries are due by August 15, 2020.

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1.4 COMPANY OVERVIEW AND STRATEGY (Continued)

INTELLECTUAL ACTIVITIES

Market

For the last eighteen months, our resources and energy were focused on developing the position of the Company for success in the emerging Quantum Random Number Generator market. The NIST Post Quantum Cryptography standardization committee is still working on the new standard and we are convinced to have the right attributes to fulfill the future requirements for the general market and be part of a highly competitive solution. We are pursuing to maintain our presence in trade shows over the next quarters.

Since March 2018, we have not seen any transaction of significant value in our market. In a nutshell, we work closely with the ETS in regards to the technology and adaptation to the needs of potential clients. After reaching some milestones on that front, we will be in a position to propose a specific solution to potential niche clients.

1.5 HIGHLIGHTS

On February 20, 2019, the Company sold its right, title and interest in the Portage-du-Fort Property for cash consideration of \$1. The Company will hold a 1.5% net smelter return ("NSR") and a 10% commission will be payable by the purchaser if the property is sold.

On April 1st, 2019, Ghyslain Gagnon, professor at the ETS became a consultant for the Integration of our technology.

On June 25, 2019, a Notice of Allowance was issued for the US. Patent Application No.: 16/150,010 Title: Method and system for generating a random bit sample, which means that the patent should be issued within 8 weeks.

As at September 30, 2019, the Company had a working capital of \$432,860 compared to a working capital of \$914,839 on December 31, 2018.

1.6 INTELLECTUAL PROPERTY

The carrying amount can be analyzed as follows:

	Balance as at December 31 2018	Additions	Balance as at September 30 2019
	\$	\$	\$
Cost			
Acquisition of SOCPRA license	446,112	-	446,112
Development costs	174,377	-	174,377
	<u>620,489</u>	<u>-</u>	<u>620,489</u>
Accumulated amortization			
Amortization	-	-	-
	<u>-</u>	<u>-</u>	<u>-</u>
Carrying amount	<u>620,489</u>	<u>-</u>	<u>620,489</u>

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1.7 SELECTED FINANCIAL INFORMATION AND OPERATING RESULTS

	Three-month periods ended September 30		Nine-month periods ended September 30	
	2019	2018	2019	2018
	\$	\$	\$	\$
Expenses				
Salaries	80,898	87,347	246,454	254,537
Travel expenses	18,456	23,640	84,407	81,293
Development costs	23,488	24,675	69,921	75,686
Professional fees	5,420	23,903	34,503	63,123
Share-based payments	-	25,442	20,074	121,345
Filing and listing fees	2,988	10,151	12,183	22,971
Rent	3,600	3,600	10,800	10,050
Insurance	3,461	3,508	10,279	10,374
Net loss and comprehensive loss for the period	(141,138)	(206,229)	(502,053)	(700,335)
Basic and diluted loss per share	(0.002)	(0.003)	(0.008)	(0.012)
Weighted average number of common shares outstanding	60,527,838	60,527,838	60,527,838	60,293,699

1.8 BALANCE SHEET

	September 30, 2019	December 31, 2018
	\$	\$
Total assets	1,080,009	1,599,028
Total liabilities	25,710	62,750
Total equity	1,054,299	1,536,278

1.9 SUMMARY OF QUARTER RESULTS

The following table sets forth selected quarterly financial information for each of the eight most recently completed quarters.

Three-month period ended	Net loss and comprehensive loss for the period	Basic and diluted loss per share
	\$	\$
September 30, 2019	(140,307)	(0.002)
June 30, 2019	(176,690)	(0.003)
March 31, 2019	(185,056)	(0.003)
December 31, 2018	(215,707)	(0.004)
September 30, 2018	(204,071)	(0.003)
June 30, 2018	(222,794)	(0.003)
March 31, 2018	(273,470)	(0.005)
December 31, 2017	(593,910)	(0.011)

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1.10 FINANCIAL SITUATION

LIQUIDITY

As of September 30, 2019, the Company had a working capital of \$432,860 compared to a working capital of \$914,839 on December 31, 2018. The decrease results mainly from the payment of operating expenses.

CASH FLOWS

The Company's operating activities used \$136,213 in the three-month period ended September 30, 2019 and \$205,453 for the same period in 2018. The decrease of \$69,240 in cash flows used results mainly from the decrease in professional fees and in net change in non-cash working capital items relating to accounts payable and accrued liabilities.

The Company's investing activities is \$ nil in the three-month period ended September 30, 2019 and \$nil for the same period in 2018.

The Company's financing activities generated \$ nil in the three-month period ended September 30, 2019 and \$nil for the same period in 2018.

RESULTS OF OPERATION

The main expenses for the three-month and nine-month periods ended September 30, 2019 were salaries for amount of \$80,898 and \$246,454, travel expenses for an amount of \$18,456 and \$84,407, development costs for \$23,488 and \$69,921, professional fees for an amount of \$5,420 and \$34,503, share-based payments for \$nil and \$20,074 and filing and listing fees for \$2,988 and \$12,183.

The main expenses for the three-month and nine-month periods ended September 30, 2018 were salaries for amount of \$87,347 and \$254,537, share-based payments for \$25,442 and \$121,345, travel expenses for an amount of \$23,640 and \$81,293, development costs for \$24,675 and \$75,686, professional fees for an amount of \$23,903 and \$63,123 and filing and listing fees for \$10,151 and \$22,971.

1.11 POST-REPORTING DATE EVENT

There is no post-reporting date event.

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1.12 STOCK OPTIONS

The Company's share options are as follows for the reporting periods:

	September 30, 2019		December 31, 2018	
	Number of options	Weighted average exercise price	Number of options	Weighted average exercise price
		\$		\$
Balance outstanding, beginning of period	4,480,000	0.20	4,880,000	0.19
Granted	150,000	0.15	-	-
Expired	<u>(380,000)</u>	0.12	<u>(400,000)</u>	0.10
Balance outstanding, end of period	<u>4,250,000</u>	0.20	<u>4,480,000</u>	0.20
Balance exercisable, end of period	<u>4,250,000</u>	0.20	<u>3,980,000</u>	0.18

The weighted average remaining contractual life for options outstanding at September 30, 2019 is 4.94 (2018 - 5.54) years.

The Company recognized an amount of \$20,074 (2018 - \$121,345) for the nine-month period ended September 30, 2019.

The weighted average fair value of the granted options was determined using the Black-Scholes option pricing model and based on the following weighted average assumptions:

	2019	2018
Average share price at date of grant	\$0.145	\$0.31
Dividends yield	-	-
Expected weighted volatility	122.26%	125%
Risk-free interest rate	1.59%	1.39%
Expected average life	3 years	10 years
Average exercise price at date of grant	\$0.15	\$0.30

Outstanding and exercisable options are as follows:

Expiry Date	Exercise Price	Number of shares		Remaining life (years)
		Outstanding	Exercisable	
	\$			
November 22, 2021	0.10	700,000	700,000	2.15
April 1, 2022	0.15	150,000	150,000	2.50
December 8, 2022	0.12	1,400,000	1,400,000	3.19
January 26, 2027	0.30	<u>2,000,000</u>	<u>2,000,000</u>	7.32
		<u>4,250,000</u>	<u>4,250,000</u>	

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1.13 SHARE PURCHASE WARRANTS

The changes in warrants during the period ended September 30, 2019 are as follows:

	September 30, 2019		December 31, 2018	
	Number of options	Weighted average exercise price	Number of options	Weighted average exercise price
		\$		\$
Balance outstanding, beginning of period	-	-	18,101,000	0.10
Expired	-	-	(13,134,000)	0.10
Exercised	-	-	<u>(4,967,000)</u>	0.10
Balance outstanding, end of period	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>

1.14 OUTSTANDING SHARE DATA

	November 21, 2019
Common shares	60,527,838
Stock options	4,250,000
Warrants	-
Broker warrants	-
	<u>64,777,838</u>

1.15 INTELLECTUAL PROPERTY

"Our technology involves detailed proprietary and engineering knowledge and specific customer adoption criteria. If the Company is not able to effectively protect its intellectual property or cater to specific customer adoption criteria, our business may suffer a material negative impact and could fail."

The success of our company will be dependent on our ability to successfully develop; qualify under current regulations and protect our technologies by way of patents and trademarks. The Company has its Patent Pending in Canada, United States, European Union and in 10 other countries. If we are unable to secure trademarks and patent protection for our intellectual property in the future, or that protection is inadequate for future products, our business may be materially adversely affected.

Further, there is no assurance that our technology does not or will not infringe upon patents, copyrights or other intellectual property rights held by third parties. The Company has mandated its Patent Agent to perform an exhaustive analysis of the Patent and Patent Pending deposited prior to ours, findings should be available very shortly, but all efforts are being made to obtain it sooner. However, we may become subject to legal proceedings and claims from time to time relating to the intellectual property of others in the ordinary course of our business. If we are found to have violated the intellectual property rights of others, we may be enjoined from using such intellectual property, and we may incur licensing fees or be forced to develop alternatives. In addition, we may incur substantial expenses and diversion of management time in defending against these third-party infringement claims, regardless of their merit. Successful infringement or licensing claims against us may result in substantial monetary liabilities, which may materially and adversely disrupt our business.

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1.15 **INTELLECTUAL PROPERTY (Continued)**

“The Company may be unable to secure or maintain regulatory qualifications for its Technology.”

The Company may be unable to secure or maintain regulatory qualifications for its products for some sector of our market. This would limit the ability of the Company to procure patent or other intellectual property protection for its technology and to license or enforce such patents if any.

1.16 **RISK AND UNCERTAINTIES**

Risk factors are discussed in detail in the Company’s Financial Statements and MD&A contained in the annual report for the year ended December 31, 2018.

1.17 **EVALUATION OF INTERNAL CONTROL OVER FINANCIAL REPORTING**

Management maintains a system of internal control over financial reporting to provide reasonable assurance that assets are safeguarded from any loss or unauthorized use and that financial information is reliable and available in a timely manner. They have also designed or had designed internal controls over financial reporting to provide reasonable assurance that financial reporting is reliable and that the financial statements are designed to report financial information in accordance with IFRS.

There were no important changes in the internal control over financial reporting during the nine-month period ended September 30, 2019, that had or could reasonably be expected to materially affect the internal control over financial reporting (“ICFR”).

1.18 **RELATED PARTY TRANSACTIONS**

The Company’s related parties include companies under common control and joint key management, as described below.

Unless otherwise stated, none of the transactions incorporate special terms and conditions and no guarantees were given or received. Outstanding balances are usually settled in cash.

1.18.1 **Transactions with key management**

The key management of the Company are the members of senior management and the Board. The remuneration for the period of key management include the following expenses:

	<u>2019</u>	<u>2018</u>
	\$	\$
Consulting fees	3,200	7,200
Salaries	234,000	216,000
Professional fees	-	2,745
Share-based payments	5,074	121,345
	<u>242,274</u>	<u>347,290</u>

An amount of \$nil (2018 - \$1,070) is due to senior management for unpaid consulting fees and is included in accounts payable and accrued liabilities.

An amount of \$6,000 (2018 - \$12,000) is due to directors for unpaid salaries and is included in accounts payable and accrued liabilities.

1.19 ADDITIONAL INFORMATION AND CONTINUOUS DISCLOSURE

This MD&A is dated November 21, 2019 and complies with Canadian Securities Administrators' *Regulation 51-102 respecting continuous disclosure obligations, c. V-1.1, r. 24*. The purpose of this MD&A is to help the reader understand and assess the material changes and trends in the Company's results and financial position. It presents Management's perspective on the Company's current and past activities and financial results, as well as an outlook of activities planned for the coming months. The Company regularly discloses additional information through press releases and other reports filed on the Company (www.quantumnumberscorp.com), and SEDAR (www.sedar.com) websites.

(s) Jean-Charles Phaneuf, President and Chief Executive Officer

(s) Pierre Miron, Chief Financial Officer

Montreal (Quebec), November 21, 2019