PYROGENESIS CANADA INC.

MANAGEMENT'S DISCUSSION AND ANALYSIS

This management's discussion and analysis ("MD&A") is intended to assist readers in understanding the business environment, strategies, performance and risk factors of PyroGenesis Canada Inc. ("PyroGenesis", or the "Company"). The MD&A provides the reader with a view and analysis, from the perspective of management, of the Company's financial results for the three and the nine months ended September 30, 2019. The MD&A has been prepared in accordance with National Instrument 51-102, Continuous Disclosure Requirements, and should be read in conjunction with the audited financial statements and related notes thereto of the Company for the year ended December 31, 2018.

The condensed financial statements and MD&A have been reviewed by PyroGenesis' Audit Committee and were approved by its Board of Directors on November 27, 2019. The Board of Directors is responsible for ensuring that the Company fulfills its responsibilities for financial reporting and is ultimately responsible for reviewing and approving the MD&A. The Board of Directors carries out this responsibility principally through its Audit Committee. The Audit Committee is appointed by the Board of Directors and is comprised of independent and financially literate directors. The Audit Committee reports its findings to the Board of Directors for its consideration when it approves the MD&A and financial statements for issuance to shareholders.

The following information takes into account all material events that took place up until November 27, 2019, the date on which the Company's Board of Directors approved this MD&A. Unless otherwise indicated, all amounts are presented in Canadian dollars. The Company's functional and reporting currency is the Canadian dollar.

Additional information regarding PyroGenesis is available on SEDAR (www.sedar.com), OTC Markets (www.otcmarkets.com) and on the Company's website at www.pyrogenesis.com.

FORWARD-LOOKING STATEMENTS

This MD&A contains forward-looking statements. All statements other than statements of historical fact contained in this MD&A are forward-looking statements, including, without limitation, the Company's statements regarding its products and services; relations with suppliers and clients; future financial position; business strategies; potential acquisitions; potential business partnering; litigation; and plans and objectives. In certain cases, forward-looking statements can be identified by the use of words such as "plans", "expects" or "does not expect", "is expected", "budget", "scheduled", "estimates", "forecasts", "intends", "anticipates" or "does not anticipate", or "believes", or variations of such words and phrases or state that certain actions, events or results "may", "could", "would", "might" or "will be taken", "occur" or "be achieved" and similar words or the negative thereof. Although management of the Company believes that the expectations represented in such forward-looking statements are reasonable, there can be no assurance that such expectations will prove to be correct.

In particular, this MD&A contains forward-looking statements that relate, but are not limited, to:

- the Company's business strategies, strategic objectives and growth strategy;
- the Company's current and future capital resources and the need for additional financing;
- the Company's ability to increase sales, including the results of the successful completion of the Company's current projects;

- management's expectation that the Company will achieve sustained annual growth and profitability, and that gross margins will increase resulting in a decrease in cost of sales as a percentage of revenue; and
- the Company's overall financial performance.

By their nature, forward-looking statements require assumptions and are subject to inherent risks and uncertainties including those discussed herein. In particular, forward-looking statements relating to future sales, growth and profitability are based on the assumption that current projects will be completed, and the Company will be awarded certain anticipated contracts pursuant to recent negotiations with, and statements made by, third parties. There is significant risk that predictions and other forward-looking statements will not prove to be accurate. Readers are cautioned to not place undue reliance on forward-looking statements made herein because a number of factors could cause actual future results, conditions, actions or events to differ materially from the targets, expectations, estimates or intentions expressed in the forward-looking statements.

The future outcomes that relate to forward-looking statements may be influenced by many factors, including, but not limited to, the strength of the Canadian, US and Asian economies; operational, funding, and liquidity risks; unforeseen engineering and environmental problems; delays or inability to obtain required financing and/or anticipated contracts; risks associated with licenses, permits and regulatory approvals; supply interruptions or labour disputes; foreign exchange fluctuations and collection risk; competition from other suppliers, or alternative, less capital intensive, energy solutions; and risk factors described elsewhere in this document under the heading "Risk Factors". We caution that the foregoing list of factors is not exhaustive, and that, when relying on forward-looking statements to make decisions with respect to the Company, investors and others should carefully consider these factors, as well as other uncertainties and potential events, and the inherent uncertainty of forward-looking statements.

Although the Company has attempted to identify significant factors that could cause actions, events or results to differ materially from those described in forward-looking statements, there may be other factors that cause actions, events or results not to be as anticipated, estimated or intended. There can be no assurance that forward-looking statements will prove to be accurate, as actual results and future events could differ materially from those anticipated in such statements. Accordingly, readers should not place undue reliance on forward-looking statements. Forward-looking statements are provided as of the date of this MD&A, and the Company assumes no obligation to update or revise such forward-looking statements to reflect new events or circumstances except as required under applicable securities laws.

The forward-looking statements contained herein are expressly qualified in their entirety by this cautionary statement. The forward-looking statements included in this MD&A are made as of the date of this MD&A or such other date specified herein.

OVERVIEW

PyroGenesis Canada Inc. is the world leader in the design, development, manufacturing and commercialization of advanced plasma processes. The Company provides engineering and manufacturing expertise, cutting-edge contract research, as well as turnkey process equipment packages to the defense, metallurgical, mining, advanced materials (including 3D printing), oil & gas, and environmental industries. With a team of experienced engineers, scientists and technicians working from its Montreal office and its 3,800m^2 production facility, PyroGenesis maintains its competitive advantage by remaining at the forefront of technology development and commercialization. PyroGenesis' core competencies allow the Company to be a leader in providing innovative plasma torches, plasma waste processes, plasma atomisation processes, high-temperature metallurgical processes, and engineering services to the global marketplace. PyroGenesis' operations are ISO 9001:2008 certified and have been ISO certified since 1997. PyroGenesis is a publicly traded Canadian company on the TSX Venture Exchange (Ticker symbol: PYR.V) and on the OTCQB in the United States (Ticker symbol: PYRNF).

SELECTED FINANCIAL INFORMATION

	Three months ended Sept 30, 2019	2018	% Change 2019vs2018	Nine months ended Sept 30, 2019	2018	% Change 2019vs2018
Revenue	**$ 2,097,437**	$ 1,097,726	91%	**$ 3,747,649**	$ 4,579,680	-18%
Cost of sales and services	**1,150,347**	845,575	36%	**2,538,538**	3,125,225	-19%
Gross margin	**947,090**	252,151	276%	**1,209,111**	1,454,455	17%
Expenses						
Selling, general and administrative	**1,499,952**	1,899,542	-21%	**4,425,834**	4,731,004	-6%
Research and development	**236,535**	177,405	33%	**544,954**	633,920	-14%
Net finance costs	**175,635**	934,039	-81%	**335,668**	1,412,051	-76%
	1,912,122	3,010,986	-36%	**5,306,457**	6,776,975	-22%
Comprehensive loss	**$ (965,032)**	$ (2,758,835)	-65%	**$ (4,097,346)**	$ (5,322,520)	-23%
Basic and diluted loss per share	**$ (0.01)**	$ (0.02)		**$ (0.03)**	$ (0.04)	
Modified EBITDA (loss)	**$ (613,531)**	$ (1,578,083)	-61%	**$ (3,198,004)**	$ (3,168,006)	1%

Modified EBITDA (loss) is not a performance measure defined under IFRS and it is not considered an alternative to Income (Loss) from operations or Comprehensive Earnings (Loss) in the context of measuring a Company's performance. Management believes that providing certain non-GAAP performance measures, in addition to IFRS measures, provides users of the Company's financial statements with an enhanced understanding of their results and related trends, and as such increases transparency and clarity. Modified EBITDA (loss) is an important measure of operating performance because it allows management, investors and others to evaluate and compare the Company's core operating results, including our return on capital and operating efficiencies, from period to period, by removing the impact of its capital structure (interest expense to service outstanding debt), asset base (depreciation and amortization), tax consequences, and other non-operating items not requiring cash outlays including share-based compensation and change in fair value of investment. Securities regulations require that companies caution readers that earnings and other measures adjusted to a basis other than IFRS do not have standardized meanings and are unlikely to be comparable to similar measures used by other companies. Accordingly, they should not be considered in isolation.

Extract from Statement of Financial Position at:

	Sept 30, 2019	Dec 31, 2018
Current assets	**2,340,510**	2,868,280
Non-current assets	**11,158,460**	5,891,195
Total assets	**$ 13,498,970**	$ 8,759,475
Current liabilities	**10,849,723**	6,969,708
Non-current liabilities	**4,215,782**	2,795,817
Total liabilities	**$ 15,065,505**	$ 9,765,525
Shareholders' deficiency	**$ (1,566,535)**	$ (1,006,050)

RESULTS OF OPERATIONS

Revenue

PyroGenesis recorded revenue of $2,097,437 in the third quarter of 2019 ("Q3, 2019"), representing an increase of 91% compared with $1,097,726 recorded in the third quarter of 2018 ("Q3, 2018"). Revenue for the nine months of fiscal 2019 was $3,747,649 a decrease of 18% over revenue of $4,579,680 during the same period in 2018.

Revenues recorded during the nine months ended September 30, 2019 were generated primarily from:

(i) PUREVAP™ related sales of $328,733 (2018 - $2,249,859),

(ii) torch related sales of $1,932,353 (2018 - $Nil),

(iii) the development and support related to systems supplied to the U.S. Military for $500,946 (2018 - $825,151).

Cost of Sales and Services and Gross Margin

	Three months ended Sept 30, 2019	2018	% Change 2019vs2018	Nine months ended Sept 30, 2019	2018	% Change 2019vs2018
Employee compensation	$ 434,624	$ 454,237	-4%	$ 1,277,859	$ 1,318,998	-3%
Subcontracting	79,579	291,817	-73%	168,467	360,146	-53%
Direct materials	516,552	23,845	2066%	876,390	1,183,602	-26%
Manufacturing overhead & other	214,767	163,951	31%	350,786	447,124	-22%
Foreign exchange loss	(50,037)	17,913	-379%	(34,252)	49,004	-170%
Investment tax credits	(50,405)	(106,188)	-53%	(115,536)	(233,649)	-51%
Cost of Sales and Services before Amortization of Intangible Asse	$ 1,145,080	$ 845,575	35%	$ 2,523,714	3,125,225	-19%
Amortization of intangible assets	5,267	-	-	14,824	-	-
Total Cost of Sales and Services	$ 1,150,347	$ 845,575	36%	$ 2,538,538	$ 3,125,225	-19%

	Three months ended Sept 30, 2019	2018	Nine months ended Sept 30, 2019	2018
Revenue	$ 2,097,437	$ 1,097,726	$ 3,747,649	$ 4,579,680
Cost of Sales and Services	1,150,347	845,575	2,538,538	3,125,225
Gross Margin	$ 947,090	$ 252,151	$ 1,209,111	$ 1,454,455
Gross Margin %	45.2%	23.0%	32.3%	31.8%

Cost of sales and services was $1,150,347 in Q3, 2019, representing an increase of 36% compared with $845,575 in Q3, 2018. On a year-to-date basis, the cost of sales was $2,538,538 a decrease of 19% as compared to $3,125,225 for the same period in 2018.

In Q3, 2019 cost of direct materials and manufacturing overhead increased to $516,552 (Q3, 2018 - $23,845), $214,767 (Q3, 2018 – $163,951) respectively, while employee compensation, subcontracting and foreign exchange decreased to $464,165 (Q3, 2018 - $763,967).

On a year-to-date basis, employee compensation, subcontracting, direct materials, manufacturing overhead and other, foreign exchange decreased to $2,639,250 (2018 - $3,358,874).

Investment tax credits recorded against cost of sales are primarily related to client funded projects that qualify for tax credits from the provincial government of Quebec. Qualifying tax credits decreased to $50,405 in Q3, 2019, compared with $106,188 in Q3, 2018. This represents a decrease of 53%. On a year-to-date basis, qualifying tax credits decreased to $115,536 in 2019, compared with $233,649 in 2018. The Company continues to make investments in research and development projects involving strategic partners and government bodies.

The gross margin for Q3, 2019, was $947,090, or 45.2% of revenue. This compares with a gross margin of $252,151 (23% of revenue) for Q3, 2018. On a year-to-date basis, the gross margin represents 32.3% of revenue versus 31.8% over the same period in 2018.

The type of contracts being executed and the nature of the project activity during any given quarter has a significant impact on both the overall level of cost of sales and services reported in a period, as well as the composition of the cost of sales and services, as the mix between labour, materials and subcontracts may be significantly different.

Selling, General and Administrative Expenses

	Three months ended Sept 30, 2019	2018	% Change 2019vs2018	Nine months ended Sept 30, 2019	2018	% Change 2019vs2018
Employee compensation	$ 756,141	$ 883,811	-14%	$ 2,380,927	$ 2,206,925	8%
Professional fees	393,810	495,393	-21%	852,830	887,001	-4%
Office and general	48,917	133,412	-63%	176,358	393,371	-55%
Travel	78,507	37,906	107%	302,346	235,117	29%
Depreciation on property and equipment	44,958	43,331	4%	145,801	113,577	28%
Depreciation rou assets	111,492	-	100%	326,830	-	100%
Investment tax credits	(7,500)	-	100%	(22,413)	-	100%
Government grants	(16,585)	(19,664)	-16%	(49,063)	(39,558)	24%
Other expenses	76,063	121,969	-38%	236,000	305,683	-23%
Sub-total before Share-based payments	$ 1,485,803	$ 1,696,158	-12%	$ 4,349,616	$ 4,102,116	6%
Share-based payments	14,149	203,384	-93%	76,218	628,888	-88%
Total selling, general and administrative	$ 1,499,952	$ 1,899,542	-21%	$ 4,425,834	$ 4,731,004	-6%

Included within Selling, General and Administrative expenses ("SG&A") are costs associated with corporate administration, business development, project proposals, operations administration, investor relations and employee training.

SG&A expenses for Q3, 2019 excluding the costs associated with share-based payments (a non-cash item in which options vest over a four-year period), were $1,485,803 representing a decrease of 12% compared with $1,696,158 reported for Q3, 2018. On a year-to-date basis, SG&A expenses before share-based payments were $4,349,616 compared with $4,102,116 in the same period in 2018.

The decrease in SG&A expenses in Q3, 2019 over the same period in 2018 is mainly attributable to the net effect of:

- a decrease of 14% in employee compensation,
- a decrease of 21% for professional fees, primarily due to a decrease in consulting fees,
- a decrease of 63% in office and general expenses, is primarily due to the reclassification of rent expense to depreciation right of use assets,
- travel costs increased by 107%, due to an increase in travels abroad,
- depreciation on property and equipment increased by 4%, primarily due to higher amounts of property and equipment being depreciated,
- depreciation on right of use assets increased by 100% due to reclassification of rent expense to depreciation of right of use assets. In prior years the rent expense was included within SG&A office and general expenses,
- investment tax credits increased by 100% due to the investment tax credits being recorded against the respective expenses in cost of goods sold, selling and general expenses and

research and development expenses versus all of the investment tax credits of Q3 2018 being recorded against cost of goods sold only,

- government grants decreased by 16% due to lower level of activities supported by such grants and,
- other expenses decreased by 38%, primarily due to lower cost of freight and shipping.

Separately, share based payments decreased by 93% in Q3, 2019, over the same period in 2018 as a result of the vesting structure of the stock option plan including the stock options granted in 2018.

Research and Development ("R&D") Costs

	Three months ended Sept 30, 2019	2018	% Change 2019vs2018	Nine months ended Sept 30, 2019	2018	% Change 2019vs2018
Employee compensation	$ 201,128	$ 258,140	-22%	$ 662,820	$ 604,046	10%
Investment tax credits	(40,798)	-	100%	(108,252)	-	100%
Subcontracting	4,665	-	100%	16,285	7,920	100%
Materials and equipment	96,441	19,591	392%	163,193	103,257	58%
Other expenses	7,411	8,685	-15%	15,433	27,708	-44%
Sub-total before government grants	$ 268,847	$ 286,416	-6%	$ 749,479	$ 742,931	1%
Government grants	(32,312)	(109,011)	100%	(204,525)	(109,011)	100%
Total net R&D costs	$ 236,535	$ 177,405	33%	$ 544,954	$ 633,920	-14%

The Company incurred $236,535 of R&D costs in Q3, 2019, compared with $177,405 in Q3, 2018, representing an increase of 33%. During the first nine months of fiscal 2019, net spending on internal R&D was $544,954 as compared to $633,920 in 2018.

In addition to internally funded R&D projects, the Company also incurred R&D expenditures during the execution of client funded projects. These expenses are eligible for Scientific Research and Experimental Development ("SR&ED") tax credits. SR&ED tax credits on client funded projects are applied against cost of sales and services (see "Cost of Sales" above).

Finance Income and Finance Costs

	Three months ended Sept 30, 2019	2018	% Change 2019vs2018	Nine months ended Sept 30, 2019	2018	% Change 2019vs2018
Adjustment to the fair value of investments	$ (70,717)	$ 756,750	-109%	$ (437,600)	$ 909,750	-148%
Finance expenses	246,352	177,289	39%	773,268	502,301	54%
Net finance costs	$ 175,635	$ 934,039	-81%	$ 335,668	$ 1,412,051	-76%

Finance expenses for Q3, 2019 totaled $246,352 as compared with $177,289 for Q3, 2018, representing an increase of 39%. The increase in net finance costs in Q3, 2019 is primarily attributable to the adjustment in fair value of investments in HPQ Silicon Resources Inc. and Beauce Gold Fields. The adjustment to the fair market value of investments for Q3 2019 resulted in a gain of $70,717 compared to a loss in the amount of $756,750 in Q3 2018.

Depreciation on Property and Equipment

	Three months ended Sept 30, 2019	2018	% Change 2019vs2018	Nine months ended Sept 30, 2019	2018	% Change 2019vs2018
Depreciation on property and equipment	$ 44,958	$ 43,331	4%	$ 145,801	$ 113,577	28%

The depreciation on property and equipment increased to $44,958 and $145,801 in Q3, 2019 for the first three months and nine months of fiscal 2019, compared with $43,331 and $113,577 in the same periods in 2018. The 4% and 28% increase are due to higher amounts of property and equipment being depreciated.

Net comprehensive loss

	Three months ended Sept 30, 2019	2018	% Change 2019vs2018	Nine months ended Sept 30, 2019	2018	% Change 2019vs2018
Net comprehensive loss	**$ (965,032)**	$ (2,758,835)	-65%	**$ (4,097,346)**	$ (5,322,520)	-23%

The net comprehensive loss for Q3 2019, of $965,032 compared to a loss of $2,758,835, in Q3 2018, represents a decrease of 65% year-over-year. The difference of $1,793,803 in the comprehensive loss in Q3 2019 is primarily attributable to the net of the factors described above, which have been summarized as follows:

(i) an increase in product and service-related revenue of $999,711 arising in Q3 2019,
(ii) an increase in product cost of sales and services totaling $304,772, primarily due to an increase in direct materials and manufacturing overhead and other,
(iii) a decrease of SG&A expenses of $399,590 arising in Q3, 2019 is primarily due to a decrease in office and general, other expenses, professional fees and employee compensation,
(iv) an increase in R&D expenses of $59,130 primarily due to an increase in materials and equipment and subcontracting,
(v) a decrease in net finance costs of $758,404 in Q3, 2019, primarily due to the fair value adjustment of investments.

EBITDA, Adjusted EBITDA and Modified EBITDA

	Three months ended Sept 30, 2019	2018	% Change 2019vs2018	Nine months ended Sept 30, 2019	2018	% Change 2019vs2018
Comprehensive loss	**$ (965,032)**	$ (2,758,835)	-66%	**$ (4,097,346)**	$ (5,322,520)	-23%
Depreciation on property and equipment	**44,958**	43,331	4%	**145,801**	113,577	28%
Depreciation rou assets	**111,492**	-	100%	**326,830**	-	100%
Amortization of intangible assets	**5,267**	-	100%	**14,825**	-	100%
Financing charges	**246,352**	177,289	39%	**773,268**	$ 502,301	54%
EBITDA (loss)	**$ (556,963)**	$ (2,538,215)	-78%	**$ (2,836,622)**	$ (4,706,642)	-40%
Other non-cash items:						
Share-based payments	**14,149**	203,384	-93%	**76,218**	628,888	-88%
Adjusted EBITDA (loss)	**$ (542,814)**	$ (2,334,831)	-77%	**$ (2,760,404)**	(4,077,756)	-32%
Change in fair value of investments	(70,717)	756,750	109%	(437,600)	909,750	-148%
Modified EBITDA (loss)	**$ (613,531)**	$ (1,578,081)	-61%	**$ (3,198,004)**	$ (3,168,006)	-1%

EBITDA is defined as Earnings (from operations) before Net Financing Charges, Taxes, Depreciation and Amortization, Adjusted EBITDA is defined as Earnings (from operations) before Net Financing Charges, Taxes, Depreciation, Amortization and other non-cash items including share-based payment costs, and Modified EBITDA is defined as Earnings (from operations) before Net Financing Charges, Taxes, Depreciation, Amortization and other non-cash items including share-based payment costs and change in fair value of investments.

EBITDA, Adjusted EBITDA and Modified EBITDA are not performance measures defined under IFRS and they are not considered an alternative to income or loss from operations, or to comprehensive earnings or loss, in the context of measuring a company's performance. Management believes that providing certain non-GAAP performance measures, in addition to IFRS measures, provides users of the Company's financial statements with an enhanced understanding of its results and related trends and increases transparency and clarity. Management believes that EBITDA, Adjusted EBITDA and Modified EBITDA are important measures of operating performance because it allows management, investors and others to evaluate and compare the Company's operating results, including its return on capital and operating efficiencies, from period-to-period by removing the impact of the Company's capital structure (interest expense to service outstanding debt), asset base (depreciation and amortization), tax consequences, and other non-operating items not requiring cash outlays including the adjustment to the fair value of investments and share-based compensation. Securities regulations require that companies caution readers that earnings and other measures adjusted to a basis other than IFRS do not have standardized meanings and are unlikely to be comparable to similar measures used by other companies. Accordingly, they should not be considered in isolation.

The EBITDA loss in Q3, 2019 was $556,963 compared with an EBITDA loss of $2,538,215 for Q3, 2018, representing a decrease of 78% year-over-year. The $1,981,252 decrease in the EBITDA loss in Q3 2019, compared with Q3 2018, is due to the decrease in comprehensive loss of $1,793,803, an increase in depreciation on property and equipment of $1,627, an increase in depreciation of right of use assets of $111,492, an increase in amortization of intangible assets of $5,267 and an increase in finance charges of $69,063.

Adjusted EBITDA loss in Q3, 2019 was $542,814 compared with an Adjusted EBITDA loss of $2,334,831 for Q3, 2018. The decrease of $1,792,017 in the Adjusted EBITDA loss in Q3, 2019 is attributable to a decrease in EBITDA loss of $1,981,252 and a decrease of $189,235 in share-based payments.

Modified EBITDA loss in Q3, 2019 was $613,531 compared with a Modified EBITDA loss of $1,578,081 for Q3, 2018, representing a decrease of 61%. The decrease in the Modified EBITDA loss in Q3, 2019 is attributable to the decrease as mentioned above in the Adjusted EBITDA loss of $1,792,017 and a decrease in the change of fair value of investments of $827,467.

SUMMARY OF QUARTERLY RESULTS

	2019			2018			
	Q3	Q2	Q1	Q4	Q3	Q2	Q1
Revenues	$2,097,437	$ 913,769	$ 736,443	$ 450,436	$ 1,097,726	$ 1,421,352	$ 2,060,602
Gross margin	947,090	185,349	92,158	(345,158)	252,152	496,398	705,906
Gross margin %	45.2%	20.3%	12.5%	-76.6%	23.0%	34.9%	34.3%
Comprehensive loss	(965,031)	(2,253,390)	(878,923)	(2,523,283)	(2,758,831)	(1,534,890)	(1,028,796)
Net loss per share - basic and diluted	(0.01)	(0.02)	(0.01)	(0.02)	(0.02)	(0.01)	(0.01)

The majority of PyroGenesis' revenue is recognised using the percentage of completion basis and is dependent on the timing of project initiation and execution, including project engineering, manufacturing, and testing.

LIQUIDITY AND CAPITAL RESOURCES

The following table summarizes the contractual maturities of financial liabilities as at September 30, 2019.

	Total	6 months or less	6 to 12 months	1- 3 years	Thereafter
	$	$	$	$	$
Accounts payable and accrued liabilities	**3,319,094**	**3,319,094**	**-**	**-**	**-**
Lease liabilities	**5,380,221**	**262,771**	**253,331**	**3,588,586**	**1,275,533**
Term loans – Controlling shareholder and CEO	**303,850**	**303,850**	**-**	**-**	**-**
Term loans – Other	**121,344**	**4,608**	**116,736**	**-**	**-**
SR&ED loans	**214,000**	**214,000**	**-**	**-**	**-**
Convertible debentures	**3,142,500**	**3,142,500**	**-**	**-**	**-**
	12,481,009	**7,246,823**	**370,067**	**3,588,586**	**1,275,533**

The Company has incurred, in the last several years, operating losses and negative cash flows from operations, resulting in an accumulated deficit of $55,163,886 and a negative working capital of $8,509,212 as at September 30, 2019 (December 31, 2018 - $51,066,540 and $4,101,428 respectively). Furthermore, as at September 30, 2019, the Company's current liabilities and expected level of expenses for the next twelve months exceed cash on hand of $276,067 (December 31, 2018 - $644,981). The Company has relied upon external financings to fund its operations in the past, primarily through the issuance of equity, debt, and convertible debentures, as well as from investment tax credits.

Revenue generated from active projects does not yet produce sufficient positive cash flow to fund operations. However, based on current backlog of $29.5MM at November 27, 2019, together with the pipeline of prospective new projects, cash flow from operations are expected to become positive in the very near future.

OFF-BALANCE SHEET ARRANGEMENTS

The Company had no off-balance sheet arrangements as at September 30, 2019.

SUMMARY OF CASH FLOWS

	Three months ended Sept 30, 2019	Three months ended Sept 30, 2018	Nine months ended Sept 30, 2019	Nine months ended Sept 30, 2018
Cash provided by (used in) operating activities	**$ (944,076)**	$ 3,040,300	**$ (3,252,371)**	$ (1,100,124)
Cash provided by (used in) investing activities	**(447)**	(2,252,581)	**(485,718)**	(3,202,822)
Cash provided by (used in) financing activities	**(72,583)**	961,193	**3,369,175**	5,513,136
Increase (decrease) in cash	**(1,017,106)**	1,748,912	**(368,914)**	1,210,190
Cash - end of period	**276,067**	1,833,036	**276,067**	1,833,036

For the three months ended Q3, 2019, cash flow used by operating activities was $944,076 compared to cash provided of $3,040,300 for the same period in the prior year. On a year to date basis, cash flow used from operating activities was $3,252,371 compared to $1,100,124 for the same period in the prior year.

The use of cash during Q3, 2019 consists of the comprehensive loss of $4,097,346 (Q3, 2018 - $5,322,520) plus adjustment for non-cash items totalling $47,839 (Q3, 2018 –$2,154,516) plus a net change in non-cash operating working capital items of $632,421 (Q3, 2018 – 2,301,175) plus interest paid of $356,241 (Q3, 2018 - interest paid of $82,249).

The net change in non-cash operating working capital items in Q3, 2019 was driven by:

a) a decrease in accounts receivable of $87,911 in Q3, 2018, compared to a decrease of $73,645 in Q3, 2018;
b) an increase in costs and profits in excess of billings on uncompleted contracts of $438,169 in Q3, 2019, compared to a decrease of $353,785 in Q3, 2018;
c) an increase in investment tax credits receivable of $98,703 in Q3, 2019, compared to an increase of $106,188 in Q3, 2018;
d) a decrease in deposits of $215,880 in Q3, 2019, compared to an amount of $Nil in Q3, 2018;
e) an increase in prepaid expenses of $9,530 in Q3, 2019, compared to an increase of $75,840 in Q3, 2018;
f) an increase in accounts payable and accrued liabilities of $615,237 in Q3, 2019, compared to an increase of $1,715,794 in Q3, 2018;
g) a decrease in billings in excess of costs and profits on uncompleted contracts of $608,031 in Q3, 2019, compared with an increase of $2,742,322 in Q3, 2018.

Investing activities resulted in a use of cash of $447 in Q3, 2019, compared to a use of cash of $2,252,581 in Q3, 2018 resulting from the purchase of property and equipment and additions to deferred development costs.

Financing activities in Q3, 2019 and the first nine months of fiscal 2019 resulted in a net use of funds of $72,583 and in a net source of funds of $3,369,175 respectively, compared with a net source of funds of $961,193 and $5,513,136 for the same periods in 2018. In 2019, the Company repaid loans of $247,200, made payment of lease liabilities of $160,902, received net proceeds of $329,200 from term loans and $3,448,077 from the issuances of common shares and purchase warrants. In 2018, the source of funds resulted from the issuance of common shares upon exercise of warrants, units and stock options, convertible debentures for net proceeds of $8,362,281 raised for general working capital purposes, and repaid an amount of $5,994,145 in convertible debentures, loans and capital lease obligations.

For Q3, 2019 and the first nine months of fiscal 2019, the net cash position of the Company decreased by $1,017,106 and $368,914, compared to an increase of $1,748,912 and $1,210,190 for the same periods in the prior year.

CAPITAL STOCK INFORMATION

The authorized share capital of the Company consists of an unlimited number of Class A common shares (the "Common Shares"). As at November 27, 2019, PyroGenesis had 140,566,450 Class A Common Shares, 20,007,441 warrants, 9,175,000 outstanding options issued, and 8,300,000 exercisable options issued.

GOING CONCERN

Cash generated from contracts and from providing engineering services to clients has historically been insufficient to meet the overall cash requirements of the Company to cover operating costs. For the Company to generate sufficient positive cash flows from operations and meet current cash requirements, the level of business must exceed that recorded to date. Management expects that the investments currently being made in accelerating projects under development for various clients, together with executing on the $29.5MM backlog at November 27, 2019, which is primarily related to the Company's successful diversification into niche markets of the additive manufacturing (including 3D printing), and metals & mining industries, will continue to improve the Company's cash position.

To date, the Company has raised financing primarily through successive issuances of equity and convertible debentures. There is no certainty that the Company will continue to be able to raise additional financing or expand its sales to fund its operations, although management is confident that it will be able to do so. These conditions indicate the existence of a material uncertainty that may cast significant doubt on the Company's ability to continue as a going concern.

The September 30, 2019 condensed financial statements have been prepared using International Financial Reporting Standards ("IFRS") applicable to a going concern, which contemplates the realization of assets and settlement of liabilities in the normal course of business as they become due. If the going concern assumption were not appropriate for these financial statements then adjustments would be necessary to the carrying value of assets and liabilities, the reported expenses and the statements of financial position classifications used. The impact on the financial statements could be material.

RELATED PARTY TRANSACTIONS

During the three and the nine months ended September 30, 2019, the Company concluded the following transactions with related parties:

Lease payments including rent and property taxes of $66,740 and $199,842 were paid to a trust whose beneficiary is the controlling shareholder and CEO (rent and property taxes of $70,352 and $211,494 were charged in 2018). A balance due of $Nil (2018 - $151,590) is included in accounts payable at September 30, 2019.

An amount of $Nil (December 31, 2018 – $240,519) is included in deposit for rent to a trust whose beneficiary is the controlling shareholder and CEO of the Company.

Interest of $Nil and $Nil (2018 - $Nil and $14,171 for the three and the nine months respectively) was charged on the $755,000 convertible debentures held by a company under common control of the controlling shareholder and CEO. Accreted interest related to the convertible debenture held by the father of the controlling shareholder and CEO of the Company amounted to $NIL in 2019 (2018 - $Nil and $11,623).

An amount of $10,213 was owed by a trust whose beneficiary is the controlling shareholder and CEO of the Company (December 31, 2018 – $10,213) of this amount $10,213 is included in accounts receivable.

A balance due to the controlling shareholder and CEO of the Company amounted to $192,737 (December 31, 2018 - $193,842) for expense reports, salary and vacation payables and is included in accounts payable and accrued liabilities as at September 30, 2019.

Amounts of $39,135 (December 31, 2018 - $7,427), of interest payable and an accretion amount of $13,239 (December 31, 2018 - $12,946), were accrued on the loan of $295,000 from the controlling shareholder and CEO of the Company and are included in accounts payable and accrued liabilities.

The key management personnel of the Company are the members of the Board of Directors and certain officers. Total compensation to key management consisted of the following:

	Three months ended September 30,		Nine months ended September 30,	
	2019	2018	**2019**	2018
	$	$	**$**	$
Salaries –officers	**136,000**	126,000	**388,000**	391,000
Pension contributions	**2,040**	2,040	**6,120**	6,120
Fees – Board of Directors	**-**	-	**-**	-
Other benefits – officers	**3,374**	3,381	**10,252**	9,902
Total compensation	**141,414**	131,421	**404,372**	407,022

A balance of $99,877 of key management compensation, of the amounts noted above, is included in accounts payable and accrued liabilities as at September 30, 2019 (December 31, 2018 - $127,748).

SUBSEQUENT EVENTS

On October 24, 2019 the Company received final approval from the TSX Venture Exchange ("TSXV") to proceed with a Normal Course Issuer Bid ("NCIB"). Pursuant to the NCIB the Company proposes to purchase, from time to time, over a period of 12 months, up to 6,750,000 (approximately 4.8%) of its common shares issued and outstanding ("Shares"). As of the date of the approval of the NCIB by the TSXV there were 139,619,450 Shares of the Company issued and outstanding. Purchases under the NCIB were scheduled to commence on or about November 1st, 2019 and will expire on the earlier of: (i) one year from such commencement; or (ii) the date on which the Company has purchased the maximum number of Shares to be acquired pursuant to the NCIB. All purchases made by the Company will be through Pollitt & Co. Inc. acting on behalf of the Company in accordance with the rules of the TSXV. The actual number of shares which will be purchased and the timing of such purchases, will be determined by the Company, and the price which the Company will pay for the Shares will be the market price at the time of the purchase.

On October 25, 2019, the Company issued 300,000 Units to unrelated parties at a price of $0.56 per Unit, for gross proceeds of $168,000. Each Unit consists of one (1) Common Share ("Common Share") and a three-quarters (.75) Common Share purchase warrant ("Warrant") of the Company. Each full Warrant entitles the holder thereof to purchase one (1) Common Share at a price of $0.75 until the date that is 15 months following the date of closing. Each Unit will be subject to a statutory hold period of four months and one day from the date of closing. In connection with the private placement the Company did not pay any finder's fees.

A total of 647,000 options with expiry dates of February 2020, September 2021 and October 2021, were exercised for net proceeds of $145,260.

CRITICAL ACCOUNTING ESTIMATES, NEW AND FUTURE ACCOUNTING POLICIES AND FINANCIAL INSTRUMENTS

For a discussion of critical accounting estimates, new and future accounting policies and financial instruments, please refer to notes 4, 5 and 21 of the annual 2018 Consolidated Financial Statements.

RISK FACTORS

PyroGenesis is subject to a number of risks and uncertainties that could significantly affect the Company's financial condition and performance. This list of risk factors may not be exhaustive as the Company operates in a rapidly changing business environment and new risk factors emerge from time to time. The Company cannot predict such risk factors, nor can the Company assess the impact, if any, of such risk factors or uncertainties on its business or the extent to which any factor, or combination of factors, may cause actual results to differ materially from those projected in any forward-looking statements. Accordingly, neither shareholders of the Company nor purchasers of securities of the Company should rely on forward-looking statements as a prediction of actual results. If any of these risks actually occur, the Company's business, results of operations, financial position and cash flows could be adversely affected. In any such case, the market price of the Company's common shares could decline, and investors may lose all or part of their investment.

Revenue Risks

PyroGenesis may experience delays in achieving revenues, particularly with plasma gasification projects which have a long sales cycle. Revenues may be delayed or negatively impacted by issues encountered by the Company or its clients including:

(a) unforeseen engineering and/or environmental problems;
(b) delays or inability to obtain required financing, licenses, permits and/or regulatory approvals;
(c) supply interruptions and/or labour disputes;
(d) foreign exchange fluctuations and/or collection risk; and
(e) competition from other suppliers and/or alternative energy solutions that are less capital intensive.
(f) trade and tariffs

There is no assurance that the business will perform as expected or that returns from the business will support the expenditures needed to develop it.

Technology Development and Manufacturing Capability Risks

PyroGenesis recently expanded into new areas of business and, as a result, many of the Company's products are at various stages of the development cycle. The Company may be unable to commercialise such products, or it may be unable to manufacture such products in a commercially viable manner. Whilst management is confident in both its technology and in its team of experienced engineers, scientists and technicians, it cannot know with certainty, which of its products will be commercialised, when such products will be commercialised, or whether such products will be able to be manufactured and distributed profitably.

Lack of Product Revenues/History of Losses

PyroGenesis has incurred losses in the majority of years since its inception. The Company's operations have not generated sufficient earnings and cash flows to date to result in consistent profitability or positive cash flow. Consequently, the Company's continued existence is dependent upon its ability to generate profitable operations by establishing and expanding its client base and/or raising adequate long-term financing. PyroGenesis has relied primarily on equity financing, debt financing, partner funding and government funding to carry on its business to date. The ability of the Company to achieve profitable sustainable operations in the future is uncertain. PyroGenesis has not yet demonstrated its ability to consistently achieve positive gross margins and its ongoing efforts to improve product gross margins may be insufficient to result in profitability.

Additional financing and dilution

PyroGenesis will require additional financing to support ongoing operations and to undertake capital expenditures. There can be no assurance that additional financing will be available to the Company when needed, or on terms acceptable to the Company. PyroGenesis' inability to raise financing to support ongoing operations or to fund capital expenditures could limit the Company's growth and may have a material adverse effect upon the Company.

The Company does not exclude raising additional funds by equity financing. In addition, at November 27, 2019, 9,175,000 stock options are currently issued and outstanding, together with 20,007,441 warrants and 3,750,000 convertible debentures. The exercise of stock options and/or warrants, together with the conversion of debentures, as well as any new equity financings, represents dilution factors for present and future shareholders.

Sales Cycle and Fixed Price Contracts

PyroGenesis sales cycle is long and the signing of new contracts is subject to delay, over which the Company has little control. The Company also enters into sales contracts with fixed pricing, which may be impacted by changes over the period of implementation. There is no assurance that delays or problems in fulfilling contracts with clients will not adversely affect the Company's activities, operating results or financial position.

Reliance on Technology

PyroGenesis will depend upon continuous improvements in technology to meet client demands in respect of performance and cost, and to explore additional business opportunities. There can be no assurance that the Company will be successful in its efforts in this regard or that it will have the resources available to meet this demand. Whilst management anticipates that the research and development will allow the Company to explore additional business opportunities, there is no guarantee that such business opportunities will be presented or realised. The commercial advantage of the Company will depend to a significant extent on the intellectual property and proprietary technology of PyroGenesis and the ability of the Company to prevent others from copying such proprietary technologies. PyroGenesis currently relies on intellectual property rights and other contractual or proprietary rights, including (without limitation) copyright, trade secrets, confidential procedures, contractual provisions, licenses and patents, to protect its proprietary technology. PyroGenesis may have to engage in litigation in order to protect its patents or other intellectual property rights, or to determine the validity or scope of the proprietary rights of others. This type of litigation can be expensive and time consuming, regardless of whether or not the Company is successful. PyroGenesis may seek patents or other similar protections in respect of particular technology; however, there can be no assurance that any future patent applications will actually result in issued patents, or that, even if patents are issued, they will be of sufficient scope or strength to provide meaningful protection or any commercial advantage to the Company. Moreover, the process of seeking patent protection can itself be long and expensive. In the meantime, competitors may develop technologies that are similar or superior to PyroGenesis' technology or design around the patents owned by the Company, thereby adversely affecting the Company's competitive advantage in one or more of its areas of business. Despite the efforts of the Company, its intellectual property rights may be invalidated, circumvented, challenged, infringed or required to be licensed to others. It cannot be assured that any steps the Company may take to protect its intellectual property rights and other rights to such proprietary technologies that are central to the Company's operations will prevent misappropriation or infringement of its technology.

Changes to Contracts

PyroGenesis is dependent upon its ability to establish and develop new relationships and to build on existing relationships with current clients. The Company cannot provide assurance that it will be successful in maintaining or advancing its relationships with current clients or procure additional clients. In addition, PyroGenesis cannot provide assurance that the U.S. Military and/or other military clients will continue to provide the Company with business. Sales to governments and governmental entities are subject to specific additional risks, such as delays in funding, termination of contracts or sub-contracts at the convenience of the government, termination, reduction or modification of contracts or sub-contracts in the event of changes in the government's policies or as a result of budgetary constraints, and increased or unexpected costs resulting in losses or reduced profits under fixed price contracts.

Foreign Exchange Exposure

PyroGenesis' products and services are increasingly being sold in markets outside of Canada, whilst most of its operating expenses and capital expenditures are denominated in Canadian dollars. As a result, the Company is exposed to fluctuations in the foreign exchange rates between Canadian dollar and the currency in which a particular sale is transacted, which may result in foreign exchange losses that could affect earnings.

Competition

The industry is competitive and PyroGenesis competes with a substantial number of companies which have greater technical and financial resources. There can be no assurance that such competitors will not substantially increase the resources devoted to the development and marketing of products and services that compete with those of the Company or that new or existing competitors will not enter the various markets in which PyroGenesis is active. There can be no assurance that competitors will not develop new and unknown technologies with which the Company may have difficulty competing. Furthermore, failure to remain cost competitive may result in PyroGenesis losing business to its competitors.

Management and Key Personnel

PyroGenesis depends on the skills and experience of its management team and other key employees. The Company relies heavily on its ability to attract and retain highly-skilled personnel in a competitive environment. PyroGenesis may be unable to recruit, retain, and motivate highly-skilled employees in order to assist the Company's business, especially activities that are essential to the success of the Company. Failure to recruit and retain highly-skilled employees may adversely affect PyroGenesis' business, financial condition and results of operations.

Implementation of a strategic plan

PyroGenesis' commercial strategy aims to leverage its products, consumables, and services whilst focusing on the resolution of problems within niche markets within the industries served by the Company. There can be no assurances as to the success of the Company's strategic plan, which should be considered under the risks perspective and difficulties frequently encountered by a developing business.

Adverse Decisions of Sovereign Governments

PyroGenesis conducts an increasing portion of its business internationally. There is no assurance that any sovereign government, including Canada's, will not establish laws or regulations that will not be detrimental to the Company's interests or that, as a foreign corporation, it will continue to have access to the regulatory agencies in other countries. Governments have, from time to time, established foreign exchange controls, which could have a material adverse effect on the Company's business, financial condition and results of operations.

Governmental Regulation

PyroGenesis is subject to a variety of federal, provincial, state, local and international laws and regulations relating namely to the environment, health and safety, export controls, currency exchange, labour and employment and taxation. These laws and regulations are complex, change frequently and have tended to become more stringent over time. Failure to comply with these laws and regulations may result in a variety of administrative, civil and criminal enforcement measures, including assessment of monetary penalties, imposition of remedial requirements and issuance of injunctions as to future compliance. The Company may be subject to compliance audits by regulatory authorities in the various countries in which it operates.

Environmental Liability

PyroGenesis is subject to various environmental laws and regulations enacted in the jurisdictions in which it operates, which govern the manufacturing, processing, importation, transportation, handling and disposal of certain materials used in the Company's operations. Management believes that it has adequate procedures in place to address compliance with current environmental laws and regulations. Furthermore, management monitors the Company's practices concerning the handling of environmentally hazardous materials. However, there can be no assurance that the Company's procedures will prevent environmental damage occurring from spills of materials handled by the Company or that such damage has not already occurred. On occasion, substantial liabilities to third parties may be incurred. The Company may have the benefit of insurance maintained by it or the operator, however, the Company may become liable for damages against which it cannot adequately insure or against which it may elect not to insure because of high costs or other reasons. The Company's clients are subject to similar environmental laws and regulations, as well as limits on emissions to the air and discharges into surface and sub-surface waters. While regulatory developments that may follow in subsequent years could have the effect of reducing industry activity, the Company cannot predict the nature of the restrictions that may be imposed. The Company may be required to increase operating expenses or capital expenditures in order to comply with any new restrictions or regulations.

Product Liability and Other Lawsuits

PyroGenesis is subject to a variety of potential product liabilities claims and other lawsuits related with its operations, including liabilities and expenses associated with product defects. The Company maintains product liability and other insurance coverage that management believes is generally in accordance with the market practice in its industry, but there can be no assurance that the Company will always be adequately insured against all such potential liabilities.

Market Liquidity

The market price for the common shares of the Company could be subject to wide fluctuations. Factors such as the announcement of significant contracts, technological innovations, new commercial products, patents, a change in regulations, quarterly financial results, future sales of common shares by the Company or current shareholders, and many other factors could have considerable repercussions on the price of the Company's common shares. In addition, the financial markets may experience significant price and value fluctuations that affect the market prices of equity securities of companies that sometimes are unrelated to the operating performance of these companies. Broad market fluctuations, as well as economic conditions generally may adversely affect the market price of the Company's common shares.

Information systems disruptions

The Company's business depends on the efficient and uninterrupted operation of its computer and communications software, hardware systems, and its other information technology. If such systems were to fail, or the Company was unable to successfully expand the capacity of these systems or integrate new technologies into its existing systems, its operations and financial results could be adversely affected.

OUTLOOK

The second half of 2019 has seen the beginning of the long awaited breakout that we have been anticipating ever since the Company embarked on a strategy, in 2017 and 2018, to (i) develop two new business lines and partner with multi-billion-dollar corporations to effectively accelerate commercialization in these new segments, and (ii) focus on recurring revenue streams in all business lines.

In the second half of 2019 the company successfully increased the backlog of signed contracts by approximately 500% to $29.5MM from $6MM at the end of Q2 2019. The cash flow from this increased backlog is expected to begin in Q4 2019.

Separately, the long-anticipated US Navy contract for two PAWDS systems, with approx. $13.5MM in anticipated revenues over 18 months, has also gained momentum in the second half of 2019. After a period in which only the longest lead items were contracted for by the US Navy, we are happy to report that, as of this writing, the Company recently completed the last formal steps before final procurement.

With this additional contract in hand, and the resultant backlog in excess of $40MM the Company will be well positioned to then embark on previously announced activities specifically aimed at increasing shareholder value (up-listing, spin-offs, and stock buy-back initiatives), which could not have started in earnest until the stock reacted to the news of these contracts. Once the above-mentioned contracts have been successfully signed, with deposits received, the resultant effect on the Company's valuation can be determined, as this will play a significant role in dictating the optimum strategy to execute.

Separately the Company will now also focus on accelerating paying projects which had been delayed as a result of the Company's decision to divert assets from such projects to those non-paying efforts which resulted in winning these breakout contracts.

In addition to the above developments, there are several smaller projects the Company is pursuing (for instance the Swedish torch transaction geared towards iron ore pelitization) which are very promising in their own right and should get traction over the next 12 months.

In short, 2019 is turning out to be all that it had been billed to be, and events are developing in such a way as to make 2019 the first of many years which will bear the fruit of strategic decisions made in the recent past.

Additional information regarding the Company can be found on SEDAR at www.sedar.com,OTC Markets (www.otcmarkets.com), and on the Company's website at www.pyrogenesis.com