



# Management Discussion and Analysis

as at December 31, 2018

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## 1. INTRODUCTION

The following is Management's Discussion and Analysis ("MD&A") of the unaudited condensed financial position and results of operations of CO<sub>2</sub> Solutions Inc. ("CO<sub>2</sub> Solutions" or "the Corporation") for the six-month periods ended December 31, 2018 and 2017 and the notes included therein. The unaudited condensed financial statements referred to herein include the accounts of the Corporation, its subsidiary companies and other linked entities, directly or indirectly controlled by the Corporation. This MD&A should be read in conjunction with the information contained in the audited consolidated financial statements and related notes for the financial year ended June 30, 2018 prepared using accounting policies consistent with International Financial Reporting Standards ("IFRS") as issued by the International Accounting Standards Board. Unless otherwise noted, all amounts expressed herein are in Canadian dollars. Management is responsible for establishing appropriate information systems, procedures and controls to ensure that all financial information disclosed externally, including this MD&A, and used internally by the Corporation, is complete and reliable. The MD&A and unaudited condensed financial statements for the six-month period ended December 31, 2018 were reviewed by the Corporation's Audit Committee and approved on February 28, 2019 by the Corporation's Board of Directors (the "Board").

### Caution Regarding Forward-Looking Statements

This MD&A contains forward-looking statements concerning anticipated developments in the Corporation's operations foreseeable future, the adequacy of the Corporation's financial resources and other events or conditions that may occur in the future. Forward-looking statements are frequently, but not always, identified by words such as "expects", "anticipates", "believes", "intends", "estimates", "predicts", "potential", "targeted", "plans", "possible" and similar expressions, or statements that events, conditions or results "will", "may", "could" or "should" occur or be achieved. These forward-looking statements include, without limitation, statements about the Corporation's market opportunities, strategies, competition, expected activities and expenditures as the Corporation pursues its business plan, the adequacy of the Corporation's available cash resources and other statements about future events or results. Forward-looking statements are statements about the future and are inherently uncertain, and actual achievements of the Corporation or other future events or conditions may differ materially from those reflected in the forward-looking statements due to a variety of risks, uncertainties and other factors, such as business and economic risks and uncertainties. Some of these risks, uncertainties and other factors are described herein under the heading "Risk Factors and Uncertainties". For the reasons set forth above, investors should not place undue reliance on forward-looking statements. The Corporation's forward-looking statements are based on the beliefs, expectations and opinions of management on the date the statements are made. Consequently, all forward-looking statements made in this MD&A involve known and unknown risks and uncertainties that could cause actual results to differ materially from those expressed or implied in these forward-looking statements.

Other than as required by Canadian securities laws, the Corporation undertakes no obligation to publicly update or revise any of its forward-looking statements, whether as a result of changed circumstances, new information, future events or for any other reason occurring after the date of this MD&A. In this MD&A, the term "CO<sub>2</sub> Solutions" and the term "Corporation" refers to CO<sub>2</sub> Solutions Inc. its subsidiary companies and other linked entities that are directly or indirectly controlled by the Corporation.

## 2. CORPORATION OVERVIEW

CO<sub>2</sub> Solutions is a leading developer of proprietary technologies for carbon dioxide (“CO<sub>2</sub>”) capture. More specifically, the Corporation is focused on commercializing an enzyme-based technology for efficient CO<sub>2</sub> capture from various industrial flue gases for reuse or sequestration.

Since its establishment, CO<sub>2</sub> Solutions has focused on developing its technology platform, testing, de-risking and enhancing that technology platform and assembling a broad patent portfolio. To support this effort, the Corporation has raised capital, recruited highly qualified personnel and established strategic partnerships and alliances. Following the successful completion of a major pre-commercial CO<sub>2</sub> capture pilot unit operated in Salaberry-de-Valleyfield, Quebec, for 2500 hours from May until October 2015, the Corporation is now in the process of monetizing its technology. This pilot unit is now used in the comprehensive CO<sub>2</sub> capture and utilization demonstration project, known as Valorisation Carbone Québec (“VCQ”) that the Corporation is actively leading (see Information on the VCQ Project, below).

The Corporation secured its first commercial project on August 11, 2016. The commissioning of this first commercial capture unit is imminent. This project confirms the Corporation’s position as the leading provider of second-generation carbon capture technologies. The Corporation is actively pursuing additional commercial projects around the world.

## 3. HIGHLIGHTS OF DEVELOPMENTS DURING AND SUBSEQUENT TO THE THREE-MONTH PERIOD ENDED DECEMBER 31, 2018



CO<sub>2</sub> Solutions 30 tonne-CO<sub>2</sub> per day carbon capture unit under construction in Saint-Félicien, Québec.

### Update on the Saint-Félicien Project

The Corporation announces that the commissioning of the CO<sub>2</sub> capture unit will begin shortly. This milestone is occurring later than originally planned, given the late delivery of certain components and

the difficult weather conditions experienced during equipment installation this fall and winter. Currently, the Corporation estimates that, due to such delays, unforeseen equipment costs, and exchange rate variations, the total cost of the CO<sub>2</sub> capture unit and ancillary equipment could attain \$11M, approximately \$2.5M higher than the October 2017 estimate provided by the Corporation's consulting engineers. Therefore, the Corporation is evaluating financing options given its current cash situation.

The CO<sub>2</sub> capture unit is currently undergoing pre-operation verifications of each of the unit's systems, after which the unit is expected to begin its operation and the first tonnes of CO<sub>2</sub> are expected to be captured. Shortly thereafter, the Corporation expects to ramp up the overall capture rate to reach the unit's nominal capacity of 30 tonnes of CO<sub>2</sub> per day. Once the capture unit reaches its nominal capacity, a six-month demonstration period is expected to begin, after which the Corporation would begin generating revenues from the sale of the CO<sub>2</sub> to Serres Toundra. This unit will be the Corporation's second operating CO<sub>2</sub> capture unit and its first commercial unit. It is expected to provide several benefits to its stakeholders, from generating revenues for CO<sub>2</sub> Solutions, to reducing the CO<sub>2</sub> emissions of Resolute pulp mill and enhancing the growth of Serres Toundra's greenhouse production. The Corporation continues to attract strong interest from corporations worldwide seeking a cost-effective and environmentally friendly CO<sub>2</sub> capture technology.

Even at this higher level of capital expenditure ("capex"), the Saint-Félicien capture unit will be profitable and its cost profile will confirm the competitive capex estimates of the Corporation's enzymatic technology at larger scale. This project is now the second commercial carbon capture project in Canada, and the first using a second-generation technology. The Corporation is confident that the project will be a stepping stone for future projects at greater scale.

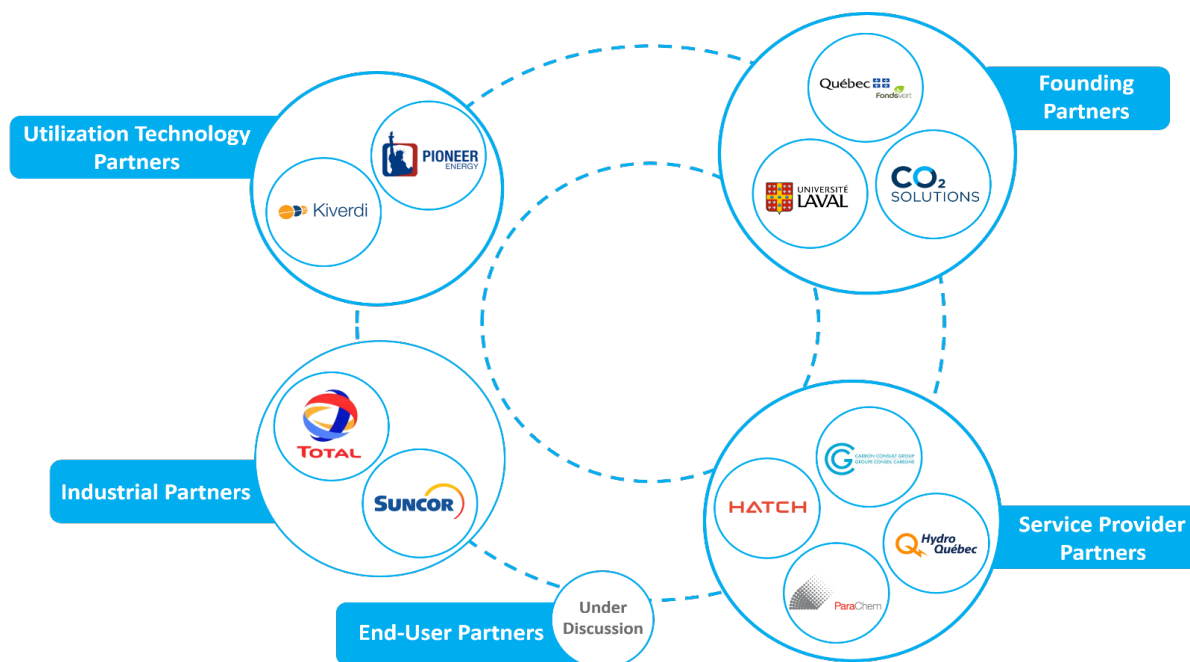
### **Update on the VCQ Project**

The Corporation continues to lead the world's most comprehensive CO<sub>2</sub> capture and utilization demonstration project, Valorisation Carbone Québec (VCQ). Launched in February 2017, the objectives of this project are to develop and demonstrate commercially viable end-to-end solutions to capture and utilize CO<sub>2</sub> in various applications while reducing greenhouse gas ("GHG") emissions. The first CO<sub>2</sub> conversion technology, converting captured CO<sub>2</sub> into methanol and then dimethyl ether, is expected to be deployed in mid-2019.

Since its launch, the VCQ project marked the following milestones:

- The creation of the management and scientific orientation committees responsible for overseeing the governance of the VCQ project. Membership of these committees is drawn from executives and scientists from industry (Suncor, Total, Hatch, CO<sub>2</sub> Solutions), academia (Université Laval, Polytechnique de Montréal) and the Quebec government.
- Total S.A. and Suncor have joined the VCQ project as the first two industrial partners (see below).
- Additional industrial CO<sub>2</sub> utilization technology and end-use partners have been identified and discussions are currently being pursued along multiple fronts to broaden even further industry's and academia's participation in the VCQ project (see below).
- An agreement was reached with Chimie Parachem (Parachem), a 51% subsidiary of Suncor Energy, for use of their industrial facilities in Montreal-East as the chosen VCQ demonstration site.
- A 10-tonne per day carbon capture plant utilizing CO<sub>2</sub> Solutions' enzymatic process in packed columns was successfully commissioned at the Parachem facilities.

- A 10-tonne per day rotating packed bed contactor has arrived on site and will be installed for operation in mid-2019.
- Over 120 CO<sub>2</sub> utilization technologies from around the world have been evaluated for their potential to effectively participate in the VCQ project.
- Agreements were reached with providers of CO<sub>2</sub> utilization technologies converting CO<sub>2</sub> into methanol, dimethyl ether and protein for animals, such as those agreements that were announced with Kiverdi and Pioneer Energy.
- Hatch Ltd., a major international consulting engineering and implementation firm, committed to provide engineering and other services to realize the installation of the various capture and utilization units on the Parachem site and, upon the conclusion of the demonstrations, will generate the related techno-economic reports.
- Carbon Consult Group, a leading carbon management and valorization group joined the VCQ project as a supplier of services to quantify the reduction of GHG emissions offered by the various technologies.
- To date, ten different organizations have confirmed their participation as partners in one or more of the other categories of the VCQ project making it a truly broad effort to address CO<sub>2</sub> mitigation through carbon capture and utilization.



### CO<sub>2</sub> Solutions Welcomes Suncor as an Industrial Partner in the VCQ Project

On November 28, 2018, CO<sub>2</sub> Solutions announced that Suncor (TSX: SU) joined the VCQ project as its second Industrial Partner. As illustrated above, the Industrial Partner category is one of five partnership types in the VCQ project along with the Founder, Supplier, Utilization Technology and End-Use categories. Industrial partners make financial contributions to the VCQ budget in exchange for access to the techno-economic reports on the capture and utilization technologies generated throughout the

project. Continuous collaboration with partners is expected to ensure the success of the VCQ project and enable significant progress in the development of utilization technologies for captured CO<sub>2</sub>.

### **CO<sub>2</sub> Solutions Enters into a Research Agreement With CNETE**

On December 12, 2018, the Corporation announced that it had entered into a research agreement with the Collège de Shawinigan's *Centre National en Électrochimie et en Technologies environnementales* ("CNETE"). CNETE's expertise lies in the areas of bioprocess, membrane separation technology and electrochemistry. Under the terms of the agreement, CNETE assists the Corporation in enhancing and managing key components of its enzyme production process. The expected result is a further decrease in the Corporation's enzymatic carbon capture technology's operating costs.

## **4. SECTOR AND POTENTIAL MARKET OVERVIEW**

### **4.1 General Overview**

In the recent months, there was an unprecedented amount of scrutiny and news coverage drawing global attention to the matters of greenhouse gas and climate changes, and their actual and potential impacts on the planet, with the latest report from the United Nations' ("UN") Intergovernmental Panel on Climate Change ("IPCC")<sup>1</sup> gaining unprecedented attention when it was released last October. This latest report clearly states the growing risks of inaction towards greenhouse gas emissions.

A little over 80% of the current energy consumed in the world comes from fossil fuels such as oil, coal and natural gas<sup>2</sup>. The combustion of these fossil fuels generates CO<sub>2</sub>, which translates into an increase in CO<sub>2</sub> concentration in the atmosphere. The CO<sub>2</sub> levels are now exceeding any historical levels. In 2018, according to the National Oceanic and Atmospheric Administration (NOAA), the average level of CO<sub>2</sub> in the atmosphere was 408.52.0 parts per million (ppm)<sup>3</sup>. This is the latest of a trend that shows a constant increase in CO<sub>2</sub> concentration of 2.2 to 3.0 ppm per year since 2015 with an average increase of 2.3 ppm per year over the last decade.

These facts are important as CO<sub>2</sub> is the most abundant greenhouse gas in the atmosphere. Greenhouse gases are trapping the solar energy in the atmosphere, modifying the energy balance and leading to the rise of the earth's temperature as well as the acidification of the oceans by dissolving in their waters. CO<sub>2</sub> Solutions endorses the overwhelming body of scientific knowledge that unequivocally establishes these impacts. This observable increase in extreme climate events is frequently associated with climate changes driven by human activity by many in the scientific community.<sup>4</sup>

Energy market projections are subject to much uncertainty, as the events that shape future developments in technology, demographic changes, economic trends, and resource availability that drive energy use cannot be foreseen with certainty.<sup>5</sup> However, the fact remains that, in order to effectively address the climate change challenge, emissions from large stationary industrial emitters, such as fossil fuel-based power plants, cement plants and metal smelters, must be reduced. Although we are witnessing massive investments in renewables, and it is expected that these investments will continue to increase, every credible indication is that fossil fuels will remain the primary energy source

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<sup>1</sup> <https://www.ipcc.ch/sr15/>

<sup>2</sup> U.S. Energy Information Administration, *International Energy Outlook 2018*.

<sup>3</sup> <https://www.esrl.noaa.gov/gmd/ccgg/trends/data.html>

<sup>4</sup> Attribution of Extreme Weather Events in the Context of Climate Change," National Academies Press, 2016

<sup>5</sup> U.S. Energy Information Administration, *International Energy Outlook 2018*.



for decades to come. Many countries are now attempting to accelerate the development and implementation of technologies that reduce CO<sub>2</sub> emissions from conventional fossil fuel-based plants, technologies such as that developed and patented by CO<sub>2</sub> Solutions.

Even though mature economies will decrease their carbon emissions by investing in cleaner and renewable energy sources, the demand for fossil fuel-based energy is expected to increase over the next decades as the growth of emerging economies will more than offset the decrease in carbon emissions of developed ("OECD") countries. According to the 2018 International Energy Outlook<sup>6</sup> ("IEO2018") Reference case that was revalidated in 2018, the world's estimated CO<sub>2</sub> emissions will continue to grow from 33.9 to 42.8 billion metric tonnes per year between 2015 and 2050, an overall increase of 25.5%.

The challenge for the world is to limit climate change through the reduction of GHG emissions while not damaging a global economy that is sustained by abundant fossil fuels. In order to effectively limit their CO<sub>2</sub> emissions, many countries, in conjunction with the 21<sup>st</sup> Conference of Parties in Paris ("COP21"), submitted emissions reduction goals or Intended Nationally Determined Contributions ("INDCs") under the United Nations Framework Convention on Climate Change ("UNFCCC"). Although these goals have tried to include specific details, such as investments in renewable energies, uncertainty remains with regards to how these macro objectives will translate in applicable policies and clear guidance to meet the goals. The figures expressed in the International Energy Outlook may change materially as laws and programs aimed at reducing CO<sub>2</sub> emissions are being implemented. In line with these objectives, recent developments have seen the United States increase the carbon capture tax credits ("45Q") in their most recent budget bill. This 45Q credit is expected to drive private investments in commercial deployment of technologies to capture CO<sub>2</sub> from power plants and industrial facilities for enhanced oil recovery and other forms of geologic storage and for beneficial uses of CO<sub>2</sub>. This enhanced carbon credit is, in our opinion, a strong indication of the pressures put on politicians, even from a country threatening to pull out of the Paris COP21 agreements, by industry to act in some way to reduce greenhouse gas emissions. This bodes well for the acceptance of second-generation CO<sub>2</sub> capture and utilization technologies in North America that are proven, low-cost and environmentally friendly, such as the one provided by CO<sub>2</sub> Solutions.

In November 2016, the Canadian Liberal government confirmed the 30% GHG emissions reduction target set by the previous government, current predictions for energy-related CO<sub>2</sub> emission growth in Canada forecast a 14% increase between 2015 and 2050.<sup>7</sup> To meet the reductions objective, Canada must decrease its GHG emissions relative to the 2015 figures by approximately 28%.<sup>8</sup> This will require an immediate significant change in how GHG emissions are viewed by society. In the past few months, provinces such as Alberta and Manitoba have expressed their intention to reject the federal carbon tax. Furthermore, the province of Saskatchewan is currently suing the federal government to be allowed to exit the federal legislation. Ontario just recently announced it was abandoning the cap and trade agreement it had with Quebec and the state of California and it is expected to join Saskatchewan's legal challenge of the federal carbon tax. In October 2018, the federal government announced that provinces that did not have a carbon mitigation process in place or had not adopted the federal carbon pricing system, namely Ontario, New Brunswick, Manitoba and Saskatchewan would be charged a federal carbon tax. Accordingly, in these provinces, a charge on fuel and a charge on carbon output for industries will be imposed starting in 2019.

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<sup>6</sup> U.S. Energy Information Administration, *International Energy Outlook 2018*.

<sup>7</sup> U.S. Energy Information Administration, *International Energy Outlook 2018*

<sup>8</sup> <https://www.ec.gc.ca/indicateurs-indicators/default.asp?lang=en&n=CCED3397-1>

In March 2018, the Auditor General of Canada reported that “most governments in Canada were not on track to meet their commitments to reducing greenhouse gas emissions and were not ready for the impacts of a changing climate. Based on the current federal, provincial, and territorial policies and actions, Canada is not expected to meet its 2020 target for reducing greenhouse gas emissions. Meeting Canada’s 2030 target will require substantial effort and actions beyond those currently planned or in place. Most Canadian governments have not assessed and, therefore, do not fully understand what risks they face and what actions they should take to adapt to a changing climate.

The federal, provincial, and territorial audit work conducted found similar key issues. Although not necessarily reflective of all governments, these key issues can be obstacles to Canada’s overall efforts to respond to climate change and to deliver on its international climate change commitments.”<sup>9</sup> (See Section 4.3 Government Regulations for more details.)

Furthermore, there is a trend in energy producers unifying their efforts in terms of clean technology development in separate entities such as the Canadian Oil Sands Innovation Alliance (“**COSIA**”), one of the sponsors of the NRG COSIA XPRIZE, and the Oil and Gas Climate Initiative (“**OGCI**”) to better focus the money spent in developing technologies and avoid redundancy of efforts. Although this facilitates the conversations between cleantech corporations and the energy industry’s investment money for the cleantech sector, it also reduces the number of sources of funding available and adds a level of complexity surrounding corporate and project investments.

The issue of oil sands GHG emissions and access to market is also impacting Western Canada’s ability to sell and distribute its oil resource, slowing the increase in Canadian oil prices. Opponents of the proposed pipelines cite the potential significant increase in greenhouse gas emissions if oil sands production increases because of greater access to markets through a new pipeline. These pipeline opponents are calling for a concrete plan that will address their concerns regarding increased CO<sub>2</sub> emissions from oil sands crude production and safety surrounding the planned pipelines. This recently resulted in open arguments and temporary economic sanctions between Alberta and British Columbia requiring intervention from the federal government. In time, this could lead Canada, Alberta, and the oil companies to increase their efforts to capture the CO<sub>2</sub> generated from the oil sands mining operations and bolster the need for new cleaner technologies to garner public support for the pipelines.

Considering this information, the Corporation remains confident that CO<sub>2</sub> capture projects will eventually be secured in Western Canada. It is the Corporation’s opinion that a carbon tax at \$50 per tonne in Canada would make CO<sub>2</sub> Solutions’ technology very appealing to Canadian GHG emitters as it is higher than the \$28 per tonne capture cost for a 1,250 tonne per day capture plant previously disclosed by the Corporation thus making the Corporation’s technology a serious cost management opportunity for large emitters.

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<sup>9</sup> [http://www.oag-bvg.gc.ca/internet/English/parl\\_otp\\_201803\\_e\\_42883.html](http://www.oag-bvg.gc.ca/internet/English/parl_otp_201803_e_42883.html)

## 4.2 Opportunities and Applications

The Corporation is also seeing increased interest in its technology from the five main industry verticals that it is focusing on:

- Power
- Oil & Gas
- Pulp & Paper
- Cement
- Mines & Metals

All the above-mentioned industry verticals are major CO<sub>2</sub> emitters, but, interestingly enough, some of those CO<sub>2</sub> emitters also use CO<sub>2</sub> as feedstock in their product process or offer very specific utilization opportunities. The Corporation is currently evaluating the common and individual needs and requirements of these verticals, and of certain corporations operating within them, to assess how CO<sub>2</sub> Solutions' proprietary technology could be implemented as a solution to reduce their GHG emissions whilst reducing the cost of the CO<sub>2</sub> required by their operations.

### Power

The power industry is a major user of fossil fuels, mainly utilized for power generation. Except for geographical areas with hydroelectricity capabilities or countries having developed nuclear power plants, most provinces in Canada and many countries in the world rely on natural gas, diesel or coal to fuel their power generation plants. This makes power plants large CO<sub>2</sub> emitters and, as such, these emitters become the focus of any government's initiative towards fighting greenhouse gases. As power generation plants come in many different sizes, they are a very attractive target for CO<sub>2</sub> Solutions to implement its current technology and, to that end, work with large utilities to scale up its technology. When these power plants are located near oil industry infrastructure, the captured CO<sub>2</sub> may be used for enhanced oil recovery ("EOR") applications.

### Oil and Gas

The oil and gas industry is, by nature, a large emitter of greenhouse gas through its refining and transformation processes. More specifically, in the oil sands, steam is utilized to facilitate the oil separation from sands and other minerals. All the heat required by the extraction and refining of oil is generated by burning fossil fuels, hence the large emissions of CO<sub>2</sub>. This industry also exhibits a high level of potential for the utilization of captured CO<sub>2</sub> in EOR applications or for the treatment of tailing ponds. Transforming the captured CO<sub>2</sub> from a refinery into green fuels, as will be demonstrated within the Corporation's Valorisation Carbone Québec project is another increasingly attractive utilization path.

CO<sub>2</sub>-based EOR, is the practice of injecting pure CO<sub>2</sub> into an aging oil well to re-pressurize the well and temporarily increase its production. This practice has been used for decades, originating in the Permian basin of West Texas. In the process, CO<sub>2</sub> mixes with crude oil (miscible phase). This phase has lower viscosity than crude oil which, combined with the increased pressure, flows to production wells. This is similar to the concept of a CO<sub>2</sub> and soda mixture being released from a shaken pop bottle. This "fizzy" mixture of CO<sub>2</sub> and crude is separated, and the CO<sub>2</sub> is recycled and reinjected along with further "fresh" CO<sub>2</sub>. As a rule, using conventional EOR techniques, for each tonne of CO<sub>2</sub> injected, approximately two to four barrels of additional oil are produced. In addition, approximately 30% of the injected CO<sub>2</sub>

remains permanently sequestered.<sup>10</sup> Given the declining natural CO<sub>2</sub> sources and the increasing demand, oil producers are increasingly looking at anthropogenic sources, where cost-effective carbon capture technology can provide a continuing opportunity for EOR. As such, the Corporation believes that its technology is well positioned to serve this market.<sup>11</sup> EOR is also gaining significant ground in Canada with the approval of the Alberta Carbon Trunk Line (“ACTL”) which is intended to obtain CO<sub>2</sub> from emitters and transport it safely to areas where it can be used for EOR.

Clean natural gas is a newer trend in the natural gas industry where there is an increase in interest for natural gas produced from the transformation of CO<sub>2</sub> into methanol and methane through various technologies, fuels that can then be reused by the very plant or industry that emitted the CO<sub>2</sub> in the first place, leading the way to small circular economies. The Corporation will be demonstrating its conversion technologies to produce methane and methanol as well as dimethyl ether in the course of its VCQ project.

### **Pulp and Paper**

The utilization of CO<sub>2</sub> in the pulp and paper industry is widespread and includes the following main uses:

#### *Regulating and Stabilizing pH*

Over the last few years, more and more pulp & paper mills have started to use CO<sub>2</sub> to regulate and stabilize pH while reducing their use of problematic mineral acids.

#### *Reducing CaCO<sub>3</sub> Dissolution*

Calcium carbonate (CaCO<sub>3</sub>) is present in most papermaking systems. CO<sub>2</sub> can be added to the process to reduce its dissolution and eliminate mineral deposits.

#### *CO<sub>2</sub> Pulp-Washing*

*CO<sub>2</sub> pulp-washing technology is widely used in fibre lines, providing better operability, lower steam consumption, reduced wash water volumes, lower volume use of foam inhibitors and pitch dispersants, and lower maintenance costs.*

#### *CO<sub>2</sub> for Soap Acidulation*

Sulphuric acid consumption for soap acidulation in the production of crude tall oil (“CTO”) can be reduced by 30% to 50% by using CO<sub>2</sub>. This also allows the pulp mill to have better control over its sulphur/sodium balance.

Most pulp and paper producers currently obtain CO<sub>2</sub> at a significant cost from external bulk gas suppliers. For the pulp & paper industry, CO<sub>2</sub> Solutions’ process could be implemented to capture CO<sub>2</sub> from boiler operations, where nil-value-process heat can provide the energy for the CO<sub>2</sub> recovery process. The result is lower CO<sub>2</sub> acquisition costs, reduced dependence on external supply sources, and a lower carbon footprint for the pulp operation.

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<sup>10</sup> <https://www.energy.gov/fe/science-innovation/oil-gas-research/enhanced-oil-recovery>

<sup>11</sup> Advanced Resources International, Inc., *The CO<sub>2</sub>-EOR Oil Recovery and CO<sub>2</sub> Utilization “Prize”*, April, 2014.

## **Cement**

The manufacturing of cement emits CO<sub>2</sub> through the thermal decomposition of calcium carbonate to produce lime and through the use of energy to power the cement plants, making the cement industry one of the largest CO<sub>2</sub> emitters in the world.

Recent technological developments have demonstrated promises towards injecting CO<sub>2</sub> into concrete to sequester it permanently. The injected CO<sub>2</sub> also acts to strengthen the concrete.

## **Carbon Capture and Utilization**

CO<sub>2</sub> Solutions' enzyme-based technology provides an elegant solution for the capture of CO<sub>2</sub> from effluent gases and for the production of pure CO<sub>2</sub> therein for utilization. Due to its physical properties, many applications for using CO<sub>2</sub> as an industrial gas have been developed over the years. Some uses go back centuries, to a time when fermentation of food (malt, wheat, grapes, etc.) led to the production of alcohol, wines, or beers in which CO<sub>2</sub> was partly re-used in the process, particularly to exclude air. Other applications for CO<sub>2</sub>, termed second generation, are more recent and have emerged partly as a result of the trend to use more environmentally friendly products in industry: two examples are CO<sub>2</sub>'s use as a solvent and CO<sub>2</sub> use as a feedstock to produce value-added products similarly as is done in the waste industry.

## **Beverage Carbonation**

Soft drink bottlers and canners require CO<sub>2</sub> as an input for the carbonation of their drinks. This is a significant cost to the producer and, in many locations, presents very challenging logistics. In this context, the opportunity exists for soft drink producers to utilize CO<sub>2</sub> Solutions' technology to replace their purchased CO<sub>2</sub> with a lower cost and secure source of CO<sub>2</sub> obtained from the flue gases of their on-site boilers, such boilers being required to generate the heated water to clean and sterilize the bottling or canning equipment. At the same time, this CO<sub>2</sub> recycling operation would provide a means of improving their environmental footprint and generating carbon credits, should they be available in their respective jurisdictions.

## **Greenhouses**

Plants absorb CO<sub>2</sub> during daylight hours as part of their growth cycle. Greenhouses, which are highly controlled environments, typically seek to supplement CO<sub>2</sub> concentrations in the ambient air up to 1,000 ppm (from the normal level of 400 ppm), resulting in plant yields being increased by as much as 50%<sup>12</sup>.

CO<sub>2</sub> for greenhouses is often obtained by burning fossil fuels such as natural gas in specialized CO<sub>2</sub> generators, where, after complete combustion, the flue gases are introduced directly into the greenhouse. The downsides of using natural gas is that moisture is produced during combustion, which may be disadvantageous for growing certain plants and, if combustion is incomplete, contaminants may be present in the flue gases and then in the greenhouses. Alternatively, pure CO<sub>2</sub> may be purchased for use. This can be supplied to greenhouses by truck in liquid form and has become popular among growers because of the elimination of the risk of crop damage, the lack of moisture production, more precise control over CO<sub>2</sub> levels and increased flexibility to introduce the CO<sub>2</sub> when needed. A

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<sup>12</sup> Advanced Resources International, Inc., *The CO<sub>2</sub>-EOR Oil Recovery and CO<sub>2</sub> Utilization "Prize"*, April, 2014

drawback of this approach, however, is that liquid CO<sub>2</sub> is typically more expensive than CO<sub>2</sub> generated from natural gas combustion<sup>13</sup>. CO<sub>2</sub> Solutions believes that its technology could solve these challenges by allowing CO<sub>2</sub> to be captured and concentrated at a cost lower than that of on-site natural gas combustion. As noted above, the Corporation's first commercial agreement for a carbon capture unit, the Saint-Félicien project, is in the process of being applied in this industry.

### **Emerging Uses of CO<sub>2</sub>**

In addition to established uses of CO<sub>2</sub>, many novel second-generation uses are under development or in an early demonstration phase<sup>14</sup>. These include algae production for making products ranging from nutraceuticals to biodiesel, the production of bioplastics, the carbonation and reuse of mineral wastes, the transformation of CO<sub>2</sub> into biochemicals and biofuels, the integration of CO<sub>2</sub> into building products such as concrete and the production of animal protein, among other applications. The previously mentioned VCQ project is a showcase of the world's most promising second-generation utilization technologies and positions the Corporation at the centre of the growing CO<sub>2</sub> capture and utilization industry, known as "CCU". The Corporation believes that its technology is positioned as an ideal front-end solution to provide the lowest possible cost CO<sub>2</sub> feedstock required by the CCU industry.

### **Carbon Capture and Sequestration**

With 70% of global energy demand currently met through the burning of carbon-based fuels, and demand predicted to double by 2035,<sup>15</sup> the world faces a growing challenge: how can it reduce CO<sub>2</sub> emissions which cause climate change while not damaging a global economy dependent on fossil fuels. A central issue to this carbon emissions problem is the fact that approximately 8,200 large stationary emitters of CO<sub>2</sub> worldwide, such as coal and natural-gas-fired power plants, oil and gas production facilities and other large industrial plants generate approximately 14.7 billion tonnes of annual emissions, or half of all total global anthropogenic CO<sub>2</sub> emissions.<sup>16</sup> As such, to deal effectively with the issue of climate change, these existing large sources of emissions must be addressed. Carbon capture and sequestration is considered one of the most promising opportunities to achieve that objective. Recently, Norway announced that it was exploring the feasibility and cost of using exhausted underwater oil wells to sequester large quantities of CO<sub>2</sub> for Europe<sup>17</sup>.

The Corporation is discussing additional scale-up partnerships and is continuing to pursue a multi-pronged strategy aimed at advancing its technology development and deployment. The prime focus in the short term will be to leverage the Corporation's internal Research and Development ("R&D") focus and efforts in view of advancing the Corporation's technology towards commercial readiness.

## **4.3 Government Regulations**

In September 2016, Canadian Federal Minister of Environment and Climate Change, Catherine McKenna, announced the federal government's intention to impose a national carbon price across Canada. Ottawa will require provinces to adopt either a carbon tax or cap-and-trade approach and to

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<sup>13</sup> Ibid

<sup>14</sup><https://www.mckinsey.com/business-functions/sustainability-and-resource-productivity/our-insights/why-commercial-use-could-be-the-future-of-carbon-capture>

<sup>15</sup> U.S. Energy Information Administration, *Annual Energy Outlook 2014*

<sup>16</sup> International Energy Agency (IEA) GHG Program; large source defined as >100,000 tonnes-CO<sub>2</sub> emissions annually

<sup>17</sup> <http://www.gassnova.no/en/co2-storage-contract-awarded-to-statoil>

meet a federally established minimum price. The federal government will impose its own system on provinces that fail to meet that minimum threshold, according to the Minister. Further, on October 3, 2016, the Prime Minister of Canada announced that, should the provinces fail to adopt a price for carbon, the federal government would impose a carbon price of up to \$50 per tonne by 2022<sup>18</sup>.

While the overall move towards regulation of greenhouse gases has been slow, CO<sub>2</sub> Solutions has seen individual governments take important leadership roles on the issue of reduction of carbon emissions. The number of jurisdictions around the world that have established or are in the process of developing GHG cap-and-trade programs, or that are implementing a carbon tax, continues to rise.

In June 2015, Alberta Environment Minister Shannon Phillips announced that the existing \$15 per tonne levy on carbon will increase to \$20 per tonne in 2016 and \$30 per tonne was reached in 2018. In addition, Alberta has recently started focusing on the least carbon-intensive projects and introduced, in November 2016, the Oil Sands Emissions Limit Act, which would limit the oil sands extraction process to a maximum of 100 million tons per year.

As noted above, in conjunction with COP21, many countries have submitted emissions reduction goals, or INDCs, under the UNFCCC. These predictions have tried to incorporate some of the specific details, such as renewable energy goals, in the forecasts; however, a great deal of uncertainty remains with regard to the implementation of policies to meet stated goals. The US Energy Information Administration's projections for CO<sub>2</sub> emissions may change significantly as laws and policies aimed at reducing GHG emissions are implemented and enforced, and if existing laws are enhanced.

CO<sub>2</sub> Solutions believes that, despite the challenges faced by the federal government to implement its national carbon price, the increased popular pressure will see the program implemented. Furthermore, it is management's opinion that the Corporation is very well positioned to capitalize on this ongoing convergence of the costs associated with emitting and capturing carbon. Management believes that the reduced cost of CO<sub>2</sub> Solutions carbon capture technology can contribute to reducing the cost of capture below the federally proposed carbon price of \$50 per tonne by 2022.

## **5. INTELLECTUAL PROPERTY HIGHLIGHTS**

### **Continued Expansion of Intellectual Property**

As many countries are increasing their efforts towards fighting climate change and thus reducing their CO<sub>2</sub> emissions, there has been a focus on the current carbon capture technologies. This has also led to more media coverage and news about carbon capture and related technologies and scientific breakthroughs. Specifically, management has noted an increase in the attention and inquiries that CO<sub>2</sub> Solutions' enzyme-based technology receives from many varied sources.

Equipped to meet this increase in focus and activity, CO<sub>2</sub> Solutions holds a broad portfolio of patents in the field of enzyme-enhanced carbon capture. As at December 31, 2018, the Corporation had 58 patents issued and 35 patents pending covering the use of carbonic anhydrase with various capture solvents and the use of the carbonic anhydrase enzyme in different reactor configurations and in key industrial processes such as power generation and cement production.

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<sup>18</sup> CBC News; Justin Trudeau gives provinces until 2018 to adopt carbon price plan; October 3, 2016

To date, the Corporation has been successful in fending off the challenges to its intellectual property and will continue to actively oppose any infringement of its patents. It should be noted that none of the actions or potential actions taken by third parties in Europe or the United States to challenge the Corporation's intellectual property has affected or would affect the Corporation's freedom to operate in any jurisdiction.

Management believes that, with its intellectual property portfolio, the Corporation is well positioned to commercialize carbonic anhydrase enzyme-based systems for the capture of CO<sub>2</sub>.

CO<sub>2</sub> Solutions will continue to file additional patents around its proprietary technology as well as complementary processes and technology as deemed appropriate, and, when challenged, it will defend its intellectual property vigorously whenever and wherever necessary.

## 6. FINANCIAL REVIEW

The Corporation is in early stages of its commercialization and has not yet earned significant revenue. Until the Corporation's projected CO<sub>2</sub> capture plants are operational, or technology licences are sold, the Corporation expects to incur losses. Quarterly losses for the three-month period ended December 31, 2018 and 2017 are comprised of R&D, general and administrative and financial expenditures. Changes in quarterly losses are dependent on the level of project activity that is ongoing net of the governmental support received.

The following tables provide a summary of certain elements of financial data regarding the Corporation for each of the last eight quarters:

	Three-month periods ended			
	December 31, 2018	September 30, 2018	June 30, 2018	March 31, 2018
Revenues	-	-	\$629,306	\$10,000
Loss (profit)	\$3,765,693	\$1,570,884	\$(384,759)	\$485,661
Loss per share	\$0.02	\$0.01	\$0.00	0.00
	Three-month periods ended			
	December 31, 2017	September 30, 2017	June 30, 2017	March 31, 2017
Revenues	-	\$15,000	-	\$49,028
Loss	\$1,096,426	\$742,989	\$938,930	\$904,386
Loss per share	\$0.01	\$0.01	\$0.01	0.01

### 6.1 Results of Operations

Comparison between the three-month and six-month periods ended December 31, 2018 and 2017.

#### Revenues

The Corporation recorded no revenues for the three-month periods ended December 31, 2018 and 2017. For the six-month periods ended December 31, 2018, and 2017, the corporation recorded \$0 and \$0.02 million respectively. For the same period in 2017, the Corporation recorded \$0.02 million.



### Research and Development Expenses

Research and development expenses, before tax credits and government assistance, increased by \$4,431,202, to \$6,399,711 for the three-month period ended December 31, 2018, compared with \$1,968,509 for the same period in 2017. Increases in the three-month period from that of the prior year mainly reflect the significant increase of work associated with the construction of the Saint-Félicien project and activities on the VCQ project. These expenses are expected to vary based upon ongoing projects undertaken by the Corporation and the level of government grants associated with those projects. Government grants serve to decrease the research and development expenses.

For the six-month period ended December 31, 2018, research and development expenditures, before tax credits and government assistance, increased by \$5,645,418 to \$11,235,365 from \$5,589,947 for the same period last year. As was the case above relative to the three-month increase, this increase reflects the higher volume of research and development activities associated with the VCQ and Saint-Félicien projects.

Government assistance for the three-month period ended December 31, 2018 was \$3,552,979, compared to \$1,837,384 for the same period in 2017. The government assistance comes in the form of subsidies granted to the Corporation mainly by the Government of Québec for the VCQ project, as well as assistance received from Sustainable Development Technology Canada (SDTC), and Technoclimat (Transition Énergétique Québec) associated with the Saint-Félicien project.

Government assistance in the form of grants received or receivable from the agencies noted above totalled \$7,405,803 for the six-month period ended December 31, 2018. For the same six-month period in 2017, grants received from SDTC and Government of Quebec totalled \$5,331,602, a difference of \$2,074,201.

Tax credits for the three-month period ended December 31, 2018 were \$152,157 (\$22,897 in 2017). This increase between the three-month periods is a result of the fact that the tax credit calculations are adjusted to reflect the amount of eligible expenses and grants received relative to those expenses. For the six-month period ended December 31, 2018, tax credits amounted to \$236,361, compared to \$43,617 in 2017. This increase reflects the fact that there were more eligible expenses in 2018 than for 2017 due to a smaller portion of projects being eligible for grants and subsidies.

### Business Development Expenses

Business development expenses were \$91,289 for the three-month period ended December 31, 2018, compared with \$91,228 for the same in 2017, representing an increase of \$61 related to similar timing in expenses in business development.

Business development expenses for the six-month period ended December 31, 2018 were \$164,363 compared to \$193,696 for the same six-month period in 2017, a net decrease of \$29,333. The net decrease is predominantly related to a decrease in compensation-related expenses (cash-based salaries and benefits and non-cash stock-based compensation) of \$49,071 offset by an increase in professional fees of \$24,832.

### General and Administrative Expenses

General and administrative expenses totalled \$928,977 for the three-month period ended December 31, 2018, compared with \$739,819 for the same period in 2017, representing an increase of \$189,158. This net increase is mainly related to:

- an increase in travel, entertainment and advertising of \$103,208;
- an increase in professional fees of \$45,985;
- an increase in salaries, employee benefits and other compensation of \$50,951;
- offset by an increase in government grants of \$13,238

General and administrative expenses totalled \$1,392,879 for the six-month period ended December 31, 2018, compared to \$1,179,424 for the same period in 2017. This net increase of \$213,455 is predominantly related to:

- an increase in travel and advertising of \$148,879;
- an increase in professional fees of \$60,783
- Offset by an increase in government grants of \$30,069

### Financial Expenses, Net

Financial expenses, net for the three-month period ended December 31, 2018, were \$50,852 compared with \$157,151 for the same period in 2017. The decrease of \$106,299 reflects changes in interest paid on term loans and convertible debentures offset by interest income earned on cash balances and a decrease on management and renewal fees offset by a decrease of \$36,571 in accretion expense and a positive change in fair value of derivatives of \$66,574.

Financial expenses, net for the six-month period ended December 31, 2018, were \$186,134 compared to \$266,567 for the same period in 2017. The decrease of \$80,433 is due to the same reasons noted above for the three-month period, with an additional increase in management and renewal fees in term loans of \$51,127.

### Loss and comprehensive loss for the three-month period ended December 31, 2018

The Corporation recorded a loss of \$3,765,693, or \$0.02 per share, for the three-month period ended December 31, 2018, an increase of \$2,669,267 from the loss of \$1,096,426, or \$0.01 per share, for the same period in 2017. For the six-month period ended December 31, 2018, the Corporation recorded a loss of \$5,336,577, or \$0.03 per share, an increase of \$3,497,162 from the loss of \$1,839,415, or \$0.01 per share, for the same period in 2017. No significant factors, other than those described above, contributed to the change in the loss for the three-month or the six-month periods.

## **6.2 Cash Flows**

Cash totalled \$1,162,821 as at December 31, 2018, compared with \$7,057,252 as at June 30, 2018.

Variations in cash between the three-month and six-month periods ended December 31, 2018 and 2017 are as follows:

#### *Operating Activities*

For the six-month period ended December 31, 2018, cash flow used for operating activities amounted to \$5,781,741 compared with \$1,261,179 required in the same six-month period for 2017, representing an increase of \$4,520,562 in cash used in operating activities primarily due to a higher loss and comprehensive loss for the six-month period ended December 31, 2018 and by a \$866,823 increase in net changes in non-cash working capital items.

#### *Investing Activities*

For the six-month period ended December 31, 2018, cash flow required for investing activities totalled \$112,690, compared with \$172,517 required for the same period in 2017, a decrease of \$59,827. This decrease in the funds required for investing activities relates primarily to costs incurred for patents.

#### *Financing Activities*

For the six-month period ended December 31, 2018, there was no cash flow generated from financing activities, compared to \$506,974 cash flow generated in 2017 mainly from the issuance of the 2017 debentures (net of fees) and reimbursements of outstanding 2015 debentures.

### **6.3 Liquidity and Going Concern**

To date, the Corporation has financed its operations mainly through cash flow obtained from technology development collaborations, the issuance of common shares or convertible securities and government assistance.

As at December 31, 2018, the Corporation had an accumulated deficit of \$45,296,161 compared to \$39,858,682 as at December 31, 2017. In addition to ongoing working capital requirements, the Corporation must secure sufficient funding to meet its capital and operational expense commitments related to its research and development projects as well as its general and administration expenses. As at December 31, 2018, the Corporation showed a working capital deficiency of \$8,095,548 compared to \$3,631,747 at the same time last year. The working capital deficiency includes cash and cash equivalents of \$1,162,821 (\$2,101,425 in 2017) and deferred grant of \$6,017,380 (\$3,553,770 in 2017). As at December 31, 2018 and currently, management estimates that these current funds alone would not be sufficient to allow the Corporation to continue its operations over the next twelve (12) months especially given the cost increase related to the Saint-Félicien project.

Through current and ongoing negotiations with potential funding partners and provincial and federal government agencies, the Corporation's management is actively seeking to raise the necessary capital to meet its funding requirements. However, there can be no assurance that management's plans or current negotiations will be successful. Until such time as financing at terms acceptable to the Corporation can be confirmed or negotiations with potential funding partners are successfully concluded, the Corporation may have to act to limit the ongoing project and development work and reduce its operating costs.

Accordingly, these conditions have resulted in an uncertainty that may cast significant doubt about the Corporation's ability to continue as a going concern and accordingly, the appropriateness of the use of IFRS applicable to a going concern as described in the following paragraph.

If management is unable to obtain new funding, the Corporation may have to act to limit ongoing projects and development work and reduce its operating costs or take other measures as deemed necessary. In the case that the Corporation is unable to continue its operations, amounts realized for assets might be less than amounts reflected in the Corporation's consolidated financial statements.

The consolidated financial statements of the Corporation do not reflect the adjustment to the carrying values of assets and liabilities, expenses and consolidated balance sheet classifications that would be necessary were the going concern assumption inappropriate. These adjustments could be material.

#### **6.4 Issued Capital**

As at February 28, 2019, the number of outstanding common shares, warrants, broker units, options, restricted share units, and deferred share units were as follows:

- common shares: 159,867,537;
- share purchase warrants: 15,791,887;
- broker units attached to 2015 Private Placement: 0;
- board, Officer, Consultant and Employee stock options: 8,728,708;
- restricted share units: 0; and,
- deferred Share Units: 3,842,819.

### **7. OFF-BALANCE SHEET ARRANGEMENTS**

As at December 31, 2018, the Corporation did not have any off-balance sheet arrangements.

### **8. RELATED PARTY TRANSACTIONS**

As at December 31, 2018, there were no related party transactions.

### **9. CRITICAL ACCOUNTING POLICIES AND ESTIMATES**

#### **9.1 Significant Management Judgments and Estimates**

The Corporation's condensed interim consolidated financial statements have been prepared in accordance with the International Financial Reporting Standards. The full description of accounting policies and estimates are presented in the relevant section or in the notes to the Corporation's audited consolidated financial statements for the financial year ended June 30, 2018.

Estimates, assumptions and judgments are continually evaluated by the Corporation and are based on historical experience and other factors, including expectations of future events that are believed to be reasonable under the circumstances.

The Corporation makes estimates, assumptions and judgments concerning the future. The estimates, assumptions and judgments that have a risk of causing a material adjustment to the carrying amounts of assets and liabilities within the next financial year are addressed below. Actual results could differ from these estimates.

## 9.2 Additional Information with Respect to Accounting for Intellectual Property

The determination and reflection of the value in the accounts of a biotech company and the accounting for patents related to new technological products or services generally calls for an understanding of the specific underlying science and technology and the benefits that can be derived from the application of the technology, often in very specialized markets. These determinations are normally based on judgments made by management, who will use their knowledge of how the ownership rights of a new technology restrict competitors from duplicating or stealing the Corporation's ideas and proprietary property. The proof of the technology's intrinsic value is often evidenced by the registration of a patent or patents. In the end, these proprietary rights are what will create value for the Corporation. IAS 38, Intangible Assets, states that an intangible asset (patents) arising from the development phase of an internal project are recognized if, and only if, they meet certain criteria. If all these criteria are met, development costs are capitalized. Based on the Corporation's current operations, patents worthy of capitalization are established only when the underlying development has reached a stage where it is ready to start the process of being patented, and generally only the professional and filing fees paid to secure the patents are capitalized. Internally generated expenses or expenses in the development phase are not included in the valuation of a patent, since the work, completed by internal research and development staff, would have been completed prior to applying for the patent (i.e. do not meet the criteria). Items to be considered in the review of intangible assets for capitalization would include:

- the technical feasibility of completing the intangible asset so that it will be available for use or sale;
- the intention to complete the intangible asset and use or sell it;
- the ability to use or sell the intangible asset;
- how the intangible asset will generate probable future economic benefits. Among other things, demonstration of the existence of a market for the output of the intangible asset or the intangible asset itself or, if it is to be used internally, the usefulness of the intangible asset;
- the availability of adequate technical, financial, and other resources to complete the development and to use or sell the intangible asset; and
- the ability to measure reliably the expenditures attributable to the intangible asset during its development.

It is the Corporation's interpretation that in consideration of the amounts capitalized and reported on CO<sub>2</sub> Solutions' consolidated statements of financial position, all these criteria have been met and the Corporation has correctly capitalized these development costs and has reflected their intrinsic value towards the potential contribution to future revenues for CO<sub>2</sub> Solutions. CO<sub>2</sub> Solutions holds a broad portfolio of patents in the field of enzyme-enhanced CO<sub>2</sub> capture. As at December 31, 2018, the Corporation had 58 patents issued and 35 patents pending covering not only the use of the carbonic anhydrase enzyme with various capture solvents, but also its use of carbonic anhydrase in different reactor configurations, in key industrial processes, such as power generation and cement production as well as paper production, and in many countries. Patents, obtained or pending, are recorded at cost and amortized on a straight-line basis over 20 years, which is the validity period of regular patents, and over 10 years for utility models. The periods of 20 and 10 years start at the date the patent is originally filed. The Corporation's patent portfolio is regularly reviewed for potential impairment and patents that are no longer deemed of value are written off. During the three-month period ended

December 31, 2018, one patent was deemed to be without value resulting in write-downs included in general and administrative expenses in the amount of \$20,230.

### 9.3 Additional Information with Respect to Accounting for the December 2017 Issue of Debentures

On December 22, 2017, the Corporation announced the closing of a public offering. In connection with the closing of the offering, the Corporation issued 1,500 units at a price of \$1,000 per unit, representing aggregate gross proceeds of \$1,500,000. Each unit consisted of an 8% convertible unsecured debenture in the principal amount of \$1,000 and 8,333 share purchase warrants of the Corporation. Each common share purchase warrant entitles the holder to purchase one common share of the Corporation at a price of \$0.12 per common share until December 21, 2020. Echelon Wealth Partners Inc. acted as sole agent for the offering pursuant to an agency agreement entered into between Echelon Wealth Partners Inc. and the Corporation. In connection with this offering, the Agent was paid a cash commission of \$85,610 on December 21, 2017, and was granted 713,387 common share purchase warrants entitling the holder to purchase 713,387 common shares of the Corporation at a price of \$0.12 per common share until December 21, 2020.

Each debenture will be convertible, at the option of the holder at any time prior to the close of business on the tenth business day immediately preceding the Maturity Date, into the number of Common shares computed on the basis of (i) an amount equal to the principal amount of the Debentures that is an integral multiple of \$1,000 principal amount divided by the conversion price of \$0.12 per Common Share (the "**Conversion Price**"), which is subject to adjustments in certain events, and (ii) an amount equal to the Interest that would have been payable on the debentures from the date of conversion to the maturity date (the "**Make-Whole Amount**"), provided, however, that such amount will be reduced by 1% for each 1% that the current market price as at the date preceding the notice of conversion exceeds the conversion price divided by the current market price of the common shares on the last trading date prior to the date of conversion. The aggregate number of common shares to be issued upon conversion of the Debentures and for any payment of the Make-Whole Amount in common shares shall not exceed the number of common shares that is equal to the principal amount of the debentures divided by \$0.09. Holders will also be entitled to receive accrued and unpaid Interest since the last interest payment date, payable in cash or common shares, at the Corporation's option. The Corporation will pay any accrued and unpaid interest that it elected to pay in common shares by issuing and delivering to the holder that number of fully paid and non-assessable common shares obtained by dividing the amount of any accrued and unpaid Interest by the current market price on the last trading date prior to the date of conversion.

No holder will be entitled to convert debentures or warrants for an amount which would result in the issuance of common shares providing the holder with more than 9.9% of the issued and outstanding common shares of the Corporation. Any holder that before acquiring units already held common shares representing more than 9.9% of the issued and outstanding common shares is exempt from this restriction; however, such holder will not be entitled to convert debentures or warrants for an amount which would result in the issuance of common shares providing the holder with more than 19.9% of the issued and outstanding common shares unless disinterested shareholder approval is obtained by the Corporation in accordance with the policies of the TSX Venture Exchange. Each full warrant entitles the holder thereof to purchase one common share at the price of \$0.12 until December 20, 2020. The offering was made in the provinces of British Columbia, Alberta, Ontario and Quebec by way of a prospectus supplement to the Corporation's base shelf prospectus dated November 23, 2015. In connection with the offering, the Corporation entered into an agency agreement with Echelon Wealth

Partners concurrently with the filing of the prospectus supplement. Net proceeds of the offering were used (i) to repay certain outstanding debts and (ii) for general working capital.

Certain "related parties" of the Corporation participated in the offering and subscribed for an aggregate of 397 Units. Participation of related parties of the Corporation in the offering constitutes a "related party transaction" as defined under Multilateral Instrument 61-101—Protection of Minority Security Holders in Special Transactions (Regulation 61-101 respecting Protection of Minority Security Holders in Special Transactions in Quebec) ("**MI 61-101**"). The offering is exempt from the formal valuation and minority shareholder approval requirements of MI 61-101, as neither the fair market value of securities being issued to related parties nor the consideration being paid by related parties exceeds 25% of the Corporation's market capitalization. The Corporation did not file a material change report 21 days prior to the closing of the offering as the details of the participation of the related parties of the Corporation had not been confirmed at that time.

## **10. NEW ACCOUNTING STANDARDS**

There has been no change in future accounting changes from those previously described in the Corporation's June 30, 2018 audited annual consolidated financial statements except for the adoption of new accounting standards:

### **IFRS 2 – Share-based Payments**

In June 2016, the IASB issued an amendment to address certain issues related to the accounting for cash-settled awards and the accounting for equity-settled awards that include a "net settlement" feature in respect of employee withholding taxes. The mandatory effective date of the amendment to IFRS 2 is for annual periods beginning on or after January 1, 2018. This standard was adopted on July 1, 2018 and did not have a material impact on the condensed interim consolidated financial statements and there was no transitional adjustment recorded on adoption.

### **IFRS 7 – Financial Instruments: Disclosures**

IFRS 7 has been amended to enhance disclosure requirements related to the offsetting of financial assets and financial liabilities. Originally, the amendments were applicable retrospectively for annual periods beginning on or after January 1, 2013. However, IFRS 7 has since been amended to require additional disclosures on transition from IAS 39, "Financial Instruments: Recognition and Measurement" to IFRS 9 (see below), effective on adoption of IFRS 9, which is effective for annual periods beginning on or after January 1, 2018. This standard was adopted on July 1, 2018 and did not have a material impact on the condensed interim consolidated financial statements and there was no transitional adjustment recorded on adoption.

### **IFRS 9, "Financial Instruments" ("IFRS 9")**

In July 2015, the IASB issued IFRS 9 to replace IAS 39 'Financial Instruments: Recognition and Measurement' ("IAS 39"). IFRS 9 uses a single approach to determine whether a financial asset is measured at amortized cost or fair value, replacing the multiple rules in IAS 39. The approach in IFRS 9 is based on how an entity manages its financial instruments in the context of its business model and the contractual cash flow characteristics of the financial assets. Most of the requirements in IAS 39 for classification and measurement of financial liabilities were carried forward unchanged to IFRS 9. The

new standard also requires a single impairment method to be used, replacing the multiple impairment methods in IAS 39. A new hedge accounting model was introduced and represents a substantial overhaul of hedge accounting which allows entities to better reflect their risk management activities in the financial statements. This standard was adopted on July 1, 2018 on a retrospective basis without restating comparatives so any cumulative adjustments would be recorded in the opening retained earnings on adoption. The adoption of IFRS 9 did not have a material impact on the condensed interim consolidated financial statements and there was no transitional adjustment recorded on adoption. The Corporation classifies its financial instruments in the categories below. These categories remain unchanged from the June 30, 2018 audited annual consolidated financial statements. The Corporation has classified its financial instrument as follows:

<b><u>Category</u></b>	<b><u>Financial instrument</u></b>
Financial assets at amortized cost	Cash and cash equivalents Certificates of deposit Accounts receivable
Financial Liabilities at amortized cost	Accounts payable and accrued liabilities Deferred grants Term loans Convertible debenture – Host Refundable contributions
Financial liabilities at fair value through profit or loss	Convertible debenture - Derivatives

## **11. RISK FACTORS AND UNCERTAINTIES**

The Corporation's activities are subject to some risk factors that generally affect biotechnology companies. The profitability of the Corporation will depend on its ability to successfully develop its technologies, to preserve its intellectual property rights, to maintain its highly qualified personnel, to conclude strategic alliances, research and development collaborations, and strategic out-licensing agreements. These activities require important financial investments. Therefore, the Corporation's ability to obtain necessary liquidities to finance its activities is essential to ensure future success and is as such an additional risk factor. The reader is referred to the applicable general risk and uncertainties described in CO<sub>2</sub> Solutions June 30, 2018 Annual Report and the related MD&A under the heading 'Risk Factors and Uncertainties'. In addition to those risks and uncertainties disclosed in its most recent annual report, the Corporation expects that it will continue incurring losses and consuming cash for the foreseeable future and therefore continues to require cash for operations. With no revenue from operations, the Corporation will continue to have negative cash flows from its operating activities and will likely need to raise additional capital, the availability of which cannot be assured.



## 12. DISCLOSURE AND INTERNAL CONTROLS

As at December 31, 2018, an evaluation of the design and operating effectiveness of the Corporation's disclosure controls and procedures, as defined in the rules of Canadian Securities Administrators, was carried out. Based on that evaluation, the President and Chief Executive Officer and the Vice President, Finance and Chief Financial Officer of the Corporation concluded that the design and operating effectiveness of those disclosure controls and procedures were effective.

Also, as at December 31, 2018, an evaluation of the design and operating effectiveness of internal controls over financial reporting, as defined in the rules of the Canadian Securities Administrators, was carried out to provide reasonable assurance regarding the reliability of financial reporting and financial statement compliance with IFRS. Based on that evaluation, the President and Chief Executive Officer and the Vice President, Finance and Chief Financial Officer of the Corporation concluded that the design and operating effectiveness of internal controls over financial reporting were effective. These evaluations were based on the framework established in *Internal Control over Financial Reporting—Guidance for Smaller Public Companies* issued by the Committee of Sponsoring Organizations of the Treadway Commission, a recognized control model, and the requirements of *Regulation 52-109 respecting Certification of Disclosure in Issuers' Annual and Interim Filings*. All control systems, no matter how well designed, have inherent limitations, including the possibility of human error and the circumvention or overriding of the controls or procedures. As a result, there is no certainty that the Corporation's disclosure controls and procedures or internal control over financial reporting will prevent all errors or all fraud. There were no changes in the internal controls over financial reporting that occurred during the three-month period ended December 31, 2018 that have materially affected, or are reasonably likely to materially affect, the Corporation's internal controls over financial reporting.

## 13. AUDITOR

The Corporation's external auditor, PricewaterhouseCoopers LLP, s.r.l./s.e.n.c.r.l. has audited the consolidated financial statements for the financial year ended June 30, 2018 and has expressed an opinion thereon. This Management's Discussion and Analysis and the condensed interim consolidated financial statements for the six-month periods ended December 31, 2018 and 2017 have not been audited nor reviewed by the Corporation's external auditors.

## 14. ADDITIONAL AND CONTINUOUS DISCLOSURE

This MD&A was prepared on February 28, 2019. Additional information relating to the Corporation, including the Corporation's Annual Information Form for the financial year ended June 30, 2018, is available on SEDAR at [www.sedar.com](http://www.sedar.com).

On behalf of management,

**[signed]** Jérémie Lavoie

Jérémie Lavoie, CPA, CA  
Vice-President, Finance,

**[signed]** Evan Price

Evan Price  
President and Chief Executive Officer