



**ANNUAL INFORMATION FORM**

**FOR THE FISCAL YEAR ENDED  
DECEMBER 31, 2017**

**KRAKEN ROBOTICS INC.**

**430 WATER STREET, SUITE 100  
ST. JOHN'S, NL  
CANADA, A1C 1E2**

**OCTOBER 11, 2018**

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## CAUTIONARY NOTE ON FORWARD-LOOKING INFORMATION

Certain statements contained in this Annual Information Form (“AIF”) and the documents incorporated by reference herein constitute forward-looking information or forward-looking statements (collectively, “forward-looking statements”) within the meaning of applicable Canadian and United States securities laws. Forward-looking statements include statements concerning the Company’s current expectations, estimates, projections, assumptions and beliefs, and, in certain cases, can be identified by the use of words such as “**seeks**”, “**plans**”, “**expects**”, “**is expected**”, “**budget**”, “**scheduled**”, “**estimates**”, “**forecasts**”, “**intends**”, “**anticipates**”, or “**believes**”, or variations of such words and phrases or statements that certain actions, events or results “**may**”, “**could**”, “**should**”, “**would**”, “**might**” or “**will be taken**”, “**occur**” or “**be achieved**”, or the negative forms of any of these words and other similar expressions.

Forward-looking statements reflect the Company’s current expectations and assumptions, and are subject to a number of known and unknown risks, uncertainties and other factors that may cause the Company’s actual results, performance or achievements to be materially different from any anticipated future results, performance or achievements expressed or implied by the forward-looking statements.

Should one or more of these risks and uncertainties materialize, or should underlying factors or assumptions prove incorrect, actual results may vary materially from those described in forward-looking statements. In making the forward-looking statements included in this AIF and the documents incorporated by reference herein, the Company has made various material assumptions, including, but not limited to:

- the Company will continue to be in compliance with regulatory requirements;
- the Company will have sufficient working capital and be able to secure additional funding necessary for the continued operation and development of the Company;
- key personnel will continue their employment with the Company and the Company will be able to obtain and retain additional qualified personnel, as needed, in a timely and cost-efficient manner;

Readers are cautioned not to place undue reliance on the forward-looking statements or the assumptions on which the Company’s forward-looking statements are based. Readers are also advised to carefully review and consider the risk factors identified in this AIF under Item 5 “**RISK FACTORS**” and elsewhere herein for a discussion of the factors that could cause the Company’s actual results, performance and achievements to be materially different from any anticipated future results, performance or achievements expressed or implied by the forward-looking statements.

Although the Company believes that the assumptions on which the forward-looking statements are made are reasonable, based on the information available to the Company on the date such statements were made, no assurances can be given as to whether these assumptions will prove to be correct. The forward-looking statements contained in this AIF and the documents incorporated by reference herein are expressly qualified in their entirety by the foregoing cautionary statements and those made in our other filings with applicable securities regulators in Canada and the United States, if any. These factors are not



intended to represent a complete list of the factors that could affect the Company and readers should not place undue reliance on forward-looking statements in this AIF.

Forward-looking statements speak only as of the date the statements are made. The Company assumes no obligation to update publicly or otherwise revise any forward-looking statements to reflect actual results, changes in assumptions or changes in other factors affecting forward-looking statements, except to the extent required by applicable securities laws. If the Company does update one or more forward-looking statements, no inference should be drawn that the Company will make additional updates with respect to those or other forward-looking statements.

## **ITEM 1: PRELIMINARY NOTES**

**1.1 Effective Date of Information** Throughout this AIF, references to “**Kraken Robotics**”, the “**Company**”, “**its**”, “**our**”, “**us**” and “**we**”, or related terms refer to Kraken Robotics Inc. (formerly Anergy), and includes, where the context requires, its subsidiaries.

All information contained herein is as at December 31, 2017, unless otherwise stated, being the date of our most recently completed financial year, and the use of the present tense and of the words “**is**”, “**are**”, “**current**”, “**currently**”, “**presently**”, “**now**” and similar expressions in this Annual Information Form is to be construed as referring to information given as of that date.

### **1.2 Financial Statements and Management Discussion and Analysis**

This AIF should be read in conjunction with the Company’s:

- (a) Audited Annual Financial Statements for the years ended December 31, 2017 and 2016;
- (b) Management Discussion and Analysis for the year ended December 31, 2017 dated May 2, 2018;
- (c) Interim Financial Statements for the (i) three months ended March 31, 2018, and (ii) six months ended June 30, 2018; and,
- (d) Management Discussion and Analysis for the (i) three months ended March 31, 2018, and (ii) six months ended June 30, 2018.

copies of which may be obtained online from the System for Electronic Document Analysis and Retrieval (“**SEDAR**”) at [www.sedar.com](http://www.sedar.com).

All financial information in this AIF has been prepared in accordance with International Financial Reporting Standards (“**IFRS**”) as issued by the International Accounting Standards Board.

### **1.3 Currency**

All dollar amounts referenced in this AIF are expressed in Canadian Dollars, unless otherwise indicated. The Company’s financial statements are prepared in accordance with IFRS. All references to “**US\$**” are to United States dollars.

### **1.4 Glossary**



In this AIF, the following terms have the meanings set forth:

“\$”	Means Canadian dollars.
“ACR”	Means “ <b>area coverage rate</b> ”, typically qualified as the area of seabed (expressed in square kilometres) that can be surveyed in a standard unit of time (expressed in hours). Standard units are km <sup>2</sup> /hr
“Acquisition”	Means the acquisition by Anergy of Kraken Subco pursuant to the Share Exchange Agreement as more particularly described in this AIF and the Company’s Filing Statement.
“Affiliate”	Means a Company that is affiliated with another Company as follows: (a) a Company is an “ <b>Affiliate</b> ” of another Company if: (i) one of them is the subsidiary of the other; or (ii) each of them is controlled by the same Person; (b) a Company is “ <b>controlled</b> ” by a Person if: (i) voting securities of the Company are held, other than by way of security only, by or for the benefit of that Person; and (ii) the voting securities, if voted, entitle the Person to elect a majority of the directors of the Company; (c) a Person beneficially owns securities that are beneficially owned by: (i) a Company controlled by that Person; or (ii) an Affiliate of that Person or an Affiliate of any Company controlled by that Person.
“Anergy”	Means Anergy Capital Inc., a company incorporated under the laws of the Province of British Columbia; a CPC, having its common shares listed on the Exchange under the trading symbol “ <b>ACA.H</b> ”.
“Associate”	Means a relationship with an individual or Company: (a) an issuer of which the Person or Company beneficially owns or controls, directly or indirectly, voting securities entitling him to more than 10% of the voting rights attached to outstanding securities of the issuer; (b) any partner of the Person or Company; (c) any trust or estate in which an Person or Company has a substantial beneficial interest or in respect of which an individual or Company serves as trustee or in a similar capacity; (d) in the case of an individual, a relative of that individual, including: (i) that Person’s spouse or child; or (ii) any relative of the Person or of his spouse who has the same residence as that Person.
“AUV”	Means Autonomous Underwater Vehicle, a pre-programmed underwater vehicle that is not controlled by an operator.
“Bathymetry”	Means the study of underwater depth of lake, seas, or ocean floors. Bathymetry is the underwater equivalent to topography.
“BCBCA”	Means the <i>Business Corporations Act</i> (British Columbia).
“Board of Directors”	Means the board of directors of the Company.
“CBCA”	Means the Canada Business Corporations Act.
“CEO”	Means Chief Executive Officer.
“CFO”	Means Chief Financial Officer.



<b>“Common Shares”</b>	Means the issued and outstanding common shares of the Company.
<b>“Company” or “Kraken”</b>	Means Kraken Robotics Inc., as it exists following the completion of the Acquisition.
<b>“Completion of the Qualifying Transaction”</b>	Means February 18, 2015, the date the Final Exchange Bulletin was issued by the Exchange.
<b>“Control Person”</b>	Means any Person that holds or is one of a combination of persons or companies that holds a sufficient number of any of the securities of an issuer so as to affect materially the control of that issuer, or that holds more than 20% of the outstanding voting securities of an issuer except where there is evidence showing that the holder of those securities does not affect materially the control of the issuer.
<b>“CPC”</b>	Means capital pool company, as defined by Exchange policies.
<b>“CVL”</b>	Means correlation velocity log. An underwater speed and navigation sensor developed by Kraken Subco as a derivative of its SAS technology. CVLs are an alternative to the historical industry standard Doppler velocity log (DVL).
<b>“Exchange”</b>	Means the TSX Venture Exchange.
<b>“Filing Statement”</b>	Means the filing statement dated February 5, 2015.
<b>“Final Exchange Bulletin”</b>	Means the Exchange Bulletin, issued February 18, 2015, following closing of the Qualifying Transaction that evidences the final Exchange acceptance of the Company’s Qualifying Transaction.
<b>“Insider”</b>	If used in relation to an issuer, means: (a) a director or senior officer of the issuer; (b) a director or senior officer of a corporation that is an Insider or subsidiary of the issuer; (c) a person that beneficially owns or controls, directly or indirectly, voting shares carrying more than 10% of the voting rights attached to all outstanding voting shares of the issuer; or (d) the issuer itself if it holds any of its own securities.
<b>“Instrument”</b>	Means National Instrument 51-102 – Continuous Disclosure Obligations.
<b>“KPG”</b>	Means Kraken Power GmbH, an affiliate of Kraken Subco registered under the laws of the Republic of Germany.
<b>“Kraken Shares”</b>	Means a common share in the share capital of Kraken Subco.
<b>“Kraken Shareholder”</b>	Means a holder of Kraken Subco Shares.
<b>“Kraken Subco”</b>	Means Kraken Robotic Systems Inc., a wholly-owned Canadian subsidiary of the Company.
<b>“KRG”</b>	Means Kraken Robotik GmbH, a wholly-owned subsidiary of Kraken Subco incorporated under the laws of the Republic of Germany.
<b>“KUS”</b>	Means Kraken Robotics US Inc., a wholly-owned subsidiary of Kraken Subco incorporated under the laws of the State of Delaware with a registered office in the State of Massachusetts.



<b>“LARS”</b>	Means Launch and Recovery System, an electro-mechanical system used to both deploy and remove underwater vehicles from launch and recovery point (the surface vessel or dock).
<b>“LOI”</b>	Means the letter of intent executed between Anergy and Kraken Subco dated September 8, 2014, as amended September 18, 2014 and October 31, 2014.
<b>“OI”</b>	Means Ocean Infinity Limited.
<b>“Person”</b>	Means a company or an individual.
<b>“Qualifying Transaction”</b>	Means a transaction where a CPC acquires Significant Assets other than cash, by way of purchase, amalgamation, merger or arrangement with another Company or by other means.
<b>“RaaS”</b>	Means the Company’s Robotics as a Service business.
<b>“ROV”</b>	Means Remotely Operated Vehicle, tethered underwater vehicles remotely controlled by an operator on a surface ship.
<b>“SAR”</b>	Means Synthetic Aperture Radar, a form of radar that is used to create high resolution images of objects, such as landscapes. SAR uses the motion of the radar antenna over a target region to provide finer spatial resolution than conventional beam-scanning radars. SAR is typically mounted on a moving platform, such as an aircraft or spacecraft.
<b>“SAS”</b>	Means Synthetic Aperture Sonar, the underwater cousin of SAR. SAS is a form of sonar in which sophisticated signal processing is used in combining a number of acoustic pings to form an image with much higher along-track resolution than conventional sonars.
<b>“SSS”</b>	Means Side Scan Sonar, a specialized system for detecting objects on the seafloor. Most side scan systems cannot provide depth information. Like other sonars, a side scan transmits sound energy and analyzes the return signal (echo) that has bounced off the seafloor or other objects.
<b>“Securities Laws”</b>	Means the Securities Act (British Columbia), the Securities Act (Alberta) and the regulations and rules under such Acts and the blanket rulings and orders issued by the British Columbia Securities Commission and the Alberta Securities Commission orders in force from time to time in such Provinces.
<b>“Share Exchange Agreement”</b>	Means the share exchange agreement among Anergy, Kraken Subco and Kraken Subco Shareholders dated November 20, 2014 which superseded and replaced the LOI.
<b>“Stock Option Plan”</b>	Means the incentive stock option plan of the Company.
<b>“Stock Options”</b>	Means the incentive stock options to purchase Common Shares pursuant to the terms of the Stock Option Plan.
<b>“Towfish”</b>	Means underwater vehicles that are tethered to a ship and towed below the water surface.





“ <b>Transfer Agent</b> ”	Means Computershare Investor Services Inc. of 510 Burrard Street, 2nd Floor Vancouver, British Columbia V6C 3B9.
“ <b>UMS</b> ”	Means Unmanned Maritime System.
“ <b>UMV</b> ”	Means Unmanned Maritime Vehicle.
“ <b>USV</b> ”	Means Unmanned Surface Vessel, a vehicle that operates on the surface of the water without a crew.
“ <b>UUV</b> ”	Means Unmanned Underwater Vehicle.

## ITEM 2: CORPORATE STRUCTURE OF THE COMPANY

### 2.1 Name, Address & Incorporation

The Company was initially incorporated under the BCBCA on May 14, 2008 under the name of Anergy Capital Inc. The Company is a reporting issuer in the Provinces of British Columbia and Alberta.

Anergy was classified as a CPC with the sole business from the time of its incorporation until the completion of its Qualifying Transaction on February 18, 2015 being the identification and evaluation of opportunities for the acquisition of an interest in assets or businesses, and once identified and evaluated, to negotiate an acquisition or participation subject to any approvals as required under applicable corporate and securities laws and subject to acceptance by the Exchange so as to complete a Qualifying Transaction.

Pursuant to the Share Exchange Agreement, Anergy acquired all of the issued and outstanding shares of Kraken Subco (the “**Acquisition**”), which is now a wholly-owned subsidiary. Anergy was then renamed “Kraken Sonar Inc.” and began to carry on the business of the Company as more fully detailed in this AIF under Item 3 “**GENERAL DEVELOPMENT OF THE BUSINESS**”. As part of the Acquisition, the Company continued under and is now governed by the CBCA. Upon Completion of the Qualifying Transaction, the Company became a Tier 2 Technology Issuer and its Common Shares resumed trading on the Exchange on February 24, 2015 under the ticker symbol “**PNG**”.

On September 20, 2017, the Company changed its name to “Kraken Robotics Inc.” and Kraken Subco changed its name to “Kraken Robotics Systems Inc.” to reflect the Company’s continued growth and evolution from manufacturing sensors to supplying complete robotic systems, software and services in the global UMS market.

The registered office of the Company is located at Suite 1600, 100 King Street West, Toronto, ON, M5X 1G5.

The head office and principal place of business of the Company are now located at:

430 Water Street, Suite 100  
 St. John’s, NL A1C 1E2  
 Phone: 709-757-5757 | Fax: 709-757-5858  
 Email: [info@krakenrobotics.com](mailto:info@krakenrobotics.com) | Website: [www.krakenrobotics.com](http://www.krakenrobotics.com).



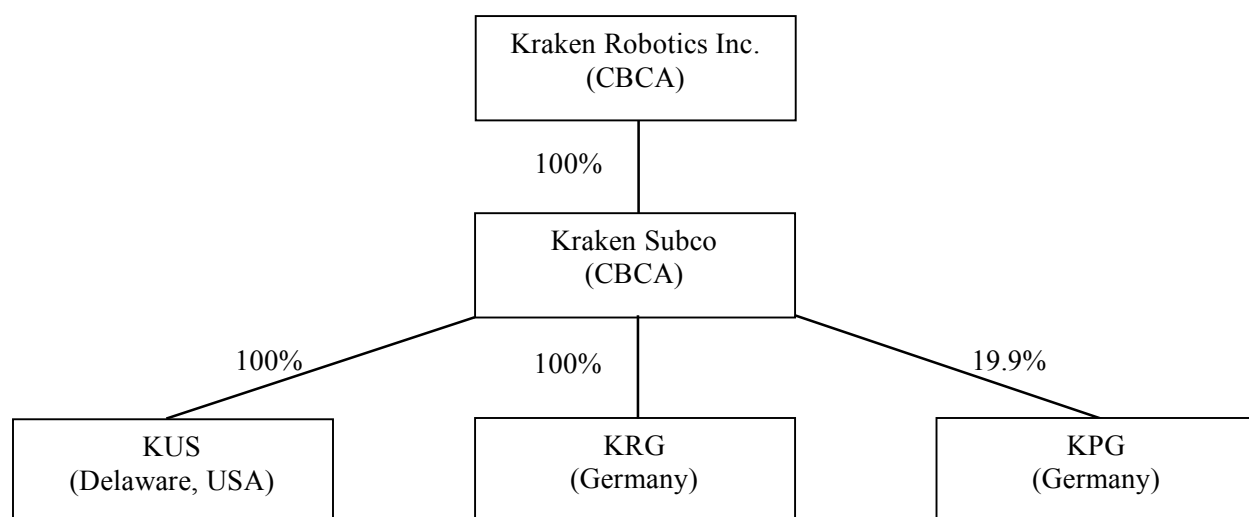
For further information regarding the Company reference is made to its filings with the Canadian securities regulatory authorities available on SEDAR at [www.sedar.com](http://www.sedar.com).

## 2.2 Intercorporate Relationships

As at the most recently completed financial year ended December 31, 2017, the Company had one wholly-owned subsidiary, Kraken Subco.

Kraken Subco is an entity incorporated under the CBCA, and has two wholly-owned subsidiaries, KUS and KRG, and owns a 19.9% equity interest in KPG with an option to increase its equity holding to 75%. Under the KPG option, Kraken Subco can increase its equity holding to 75% by paying €230,000 to a party related to KPG's Chief Technology Officer.

The different subsidiaries bring different skillsets to the table including sensor, software, and system development, and manufacturing allowing for cross-geography development. In this AIF, the term "Company" includes, where appropriate, Kraken Subco, KUS, KRG, and KPG.



## ITEM 3: GENERAL DEVELOPMENT OF THE BUSINESS

### 3.1 Qualifying Transaction - Kraken Subco Acquisition

On February 18, 2015, the Company completed the Acquisition, whereby Anergy acquired all of the issued and outstanding shares of Kraken Subco to constitute the Company's Qualifying Transaction. Under the Share Exchange Agreement, Anergy acquired all of the issued and outstanding Kraken Subco Shares from the Kraken Subco Shareholders in consideration of issuing to the Kraken Subco Shareholders an aggregate of 65,563,333 Anergy common shares (post-consolidation) at the deemed price of \$0.15 per Anergy common share.

Upon completion of the Acquisition, there were 70,957,110 Common Shares issued and outstanding on an undiluted basis. The Common Shares resumed trading on the Exchange on February 24, 2015.



### 3.2 Equity Financings following the Qualifying Transaction

On August 15, 2016, the Company closed a non-brokered Private Placement offering comprised of 7,159,534 units (the “**2016 Units**”) at a price of \$0.15 per 2016 Unit for aggregate gross proceeds of \$1,073,930. Each 2016 Unit consisted of one common share and one-half of one common share purchase warrant (each whole common share purchase warrant, a “**2016 Warrant**”), with each 2016 Warrant exercisable to acquire one common share of Kraken at \$0.30 for a period of 24 months from the date of issuance. The Company paid cash finder’s fees of \$18,375 in connection with the offering. A total of 3,579,767 2016 Warrants were issued in connection with this offering.

On April 11, 2017, the Company closed a non-brokered private placement offering comprised of 11,806,660 units (the “**2017 Units**”) at a price of \$0.18 per 2017 Unit for aggregate gross proceeds of \$2,125,199. Each 2017 Unit consisted of one common share and one-half of one common share purchase warrant (each whole common share purchase warrant, a “**2017 Warrant**”), with each 2017 Warrant exercisable to acquire one common share of Kraken at \$0.30 for a period of 24 months from the date of issuance. The Company paid cash finder’s fees of \$12,600 and issued 191,333 finders warrants in connection with the offering. A total of 5,903,330 2017 Warrants were issued in connection with this offering.

On February 26, 2018, the Company closed a non-brokered private placement offering comprised of 10,714,285 Common Shares at a price of \$0.18 per Common Share for aggregate gross proceeds of \$1,500,000. The Company issued 9,000 Common Shares as finder’s shares in connection with the offering.

On June 28, 2018, the Company closed a non-brokered private placement offering with OI comprised of 11,520,000 units (the “**OI Units**”) at a price of \$0.20 per OI Unit for aggregate gross proceeds of \$2,304,000. Each OI Unit consisted of one common share and one-half of one common share purchase warrant (each whole common share purchase warrant, an “**OI Warrant**”), with each OI Warrant exercisable to acquire one common share of Kraken at \$0.40 for a period of 36 months from the date of issuance, subject to adjustment and acceleration.

### 3.3 Recent Development of the Business and Company Milestones

In March 2017, Kraken signed an exclusive technology licensing agreement with German’s Fraunhofer Institute for underwater robotics technology. Fraunhofer is the largest organization for applied research in Europe. Through this agreement, Kraken gained exclusive access underwater robotics intellectual property and ownership of Fraunhofer’s AUV prototype, the DEDAVE. DEDAVE was subsequently rebranded as Kraken’s ThunderFish®. When combined with Kraken’s AUV intellectual property portfolio, this agreement help Kraken reduce development cost and lead-time and mitigate the technical risk for Kraken’s AUV development efforts.

In October 2017, Kraken announced a strategic partnership with Avitas Systems, a GE Venture to advance subsea robotic inspection. Under this partnership the companies expect to integrate AUVs, acoustic and laser sensor technology, and artificial intelligence-based navigation software into unique subsea inspection solutions for the oil and gas, offshore renewable energy, and shipping industries. The two companies began working together in November 2017 under a contract awarded by PRNL for the development of underwater sensors and robotics that will advance digitalization of integrated operations with Newfoundland and Labrador’s oil and gas sector.



In January 2018, KRG was named a winner in the Carbon Trust's Offshore Wind Accelerator (OWA) competition. The OWA is a collaborative R&D program funded by nine leading offshore wind developers and the Scottish government to reduce the cost of offshore wind energy. Kraken is using this opportunity to develop relationships with leading offshore wind developers and suppliers to them. The Company's SeaVision® and KATFISH technology are applicable to offshore wind turbine and submarine cable survey and inspection.

In February 2018, Kraken announced a strategic alliance with ThayerMahan Inc. ("TMI"), a U.S. based systems integrator specializing in maritime autonomous systems. TMI's mission is to integrate and deploy the latest sensors, robotics, and machine learning technology as affordable and innovative solutions. TMI was founded by retired U.S. Navy Vice Admiral Mike Connor, who served as Commander of the entire U.S submarine force from September 2012 until September 2015. The US market is the largest market for underwater robotics and sensors for defense and homeland security applications. Kraken has spent more than 5 years 'planting seeds' with small volume sales, trial activity, and partnerships. Kraken is hopeful its partnership with TMI could be a key driver of opening up this market to Kraken.

Also in February 2018, the Canadian Ministry of Innovation, Science and Economic Development announced that 5 new superclusters were selected to receive part of \$950 million of federal funding. The Ocean Supercluster of which Kraken is a member, was one of the selected winners. Kraken expects to benefit in conjunction with other industry partners to apply our advanced sensors, artificial intelligence software and robotics technology across a range of ocean industries that include fisheries, aquaculture, oil and gas, marine bio products, transportation, defense, marine renewables and ocean technology.

In July 2018, Kraken entered into a memorandum of understanding with OI for a strategic alliance on maritime robotics technology, products, and services. OI is a well-funded, new entrant in the ocean survey and exploration business. They are investing in industry-best technology to better automate the ocean survey data acquisition chain and accelerate industry adoption. Kraken signed its first contract for MINSAS sensors in the fall of 2017. The relationship with OI has grown and in June 2018 OI made a strategic investment of \$2.3 million in Kraken equity. In Q3 2018, Kraken was awarded a \$9 million contract for deep sea pressure tolerant batteries. The companies expect to work together and there is potential for future co-development of products and services. The goal is to provide leading technology for seabed mapping which drives operational efficiencies and actionable intelligence through rapid processing and intelligent analysis of collected data.

## **ITEM 4: DESCRIPTION OF THE INDUSTRY AND BUSINESS**

### **4.1 History**

Kraken is a marine technology company providing ultra-high-resolution software-centric sensors and underwater robotic systems. The Company's mission is to become a leading provider of underwater robotics equipment and services. Leveraging technology development tracing back to 2009 at a previous company, Kraken started with eight employees in 2012 to develop and commercialize SAS technology. Today, Kraken has 50 employees with a head office in St. John's, Newfoundland, Canada and has shipped product to customers in 10 countries. Of these 50 employees, 43 are engaged in R&D, engineering and production.



Kraken has a highly capable team of engineers, scientists, and technicians with specialized skills. Scientific staff have world-leading expertise in sonar design, remote sensing, and signal processing for synthetic aperture sonar, anti-submarine warfare, and 3D optical imaging. Kraken's mechanical engineering team has extensive experience designing tethered/towed and untethered/free-swimming underwater vehicles, custom payload sections, and launch and recovery systems. Kraken's software engineering group develops applications for data acquisition, real-time processing, vehicle control, 3D visualization, telemetry, artificial intelligence, machine learning and data post-processing. The company is supported by a team of technicians that perform assembly, inspection, testing, calibration, and troubleshooting of mechanical and electrical systems. Kraken's technical staff also have extensive experience performing system integration onboard customer-owned vehicles and conducting operations at sea to collect data for a variety of surveys, technical demonstrations, and collaborative research projects.

Kraken's products are sold into both the manned and the UMV market. The UMV can be divided into UUVs and USVs. UUVs are either AUVs, ROVs, or Towfish. UUVs are used extensively for military and commercial applications, such as undersea search and survey missions. USVs may be remotely operated or be fully autonomous.

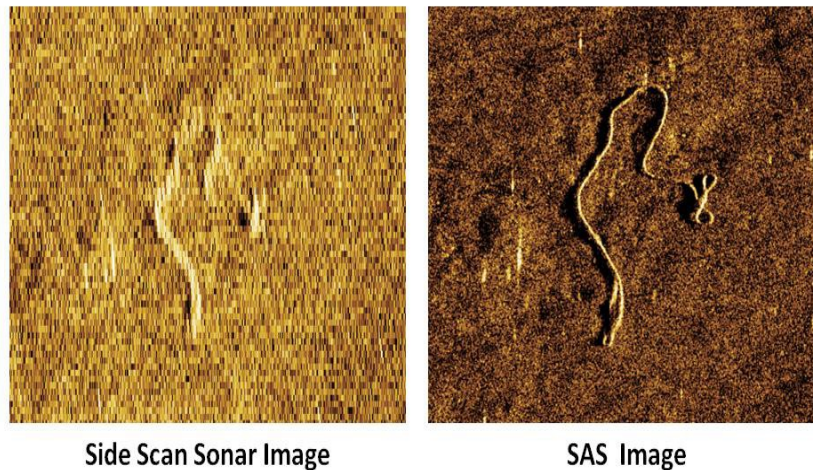
Kraken was founded with the objective of commercializing a software-centric version of SAS at the lowest cost in the market to compete with more hardware-dependent and expensive SAS solutions. SAS is an advanced imaging technology which dramatically improves seabed surveys by providing ultra-high-resolution imagery at superior ACRs as compared to conventional SSS technologies. These legacy SAS systems were seen as the domain of global defense contractors using SAS for military surveillance purposes to detect seabed mines or other types of unexploded ordnances. SAS is the next generation of sonar, following side scan sonar and multi-beam echo sounders, which while capable of producing high resolution images of objects on the seabed, only do so at short range and corresponding low ACR. SAS, on the other hand, is capable of producing ultra-high-resolution imagery at long ranges, which can be more than ten times the range of conventional side scan sonar, all while achieving significantly higher ACR.

SAS is the underwater equivalent of SAR used in the satellite and communications industry. This technology is 'rare air technology' with Kraken having only a handful of competitors at the high end of the market. Customers using SAS technology are looking to get maximum ACR at the highest resolution, for the lowest cost. One factor affecting ACR is the length of the aperture (antenna). Traditional sonar technology such as SSS uses real apertures that are limited by the size of the underwater vehicle they are deployed on. SAS, on the other hand, uses the motion of the underwater vehicle along with highly sophisticated signal processing algorithms to 'spoof' the system into thinking the aperture is 40-50 times longer than it really is. The result is up to a 10 times increase in area coverage rates over traditional SSS. In other words, more area can be surveyed at a much higher resolution in less time. The graphic below illustrates the difference in image quality of a 20 metre towrope lying on the seabed:



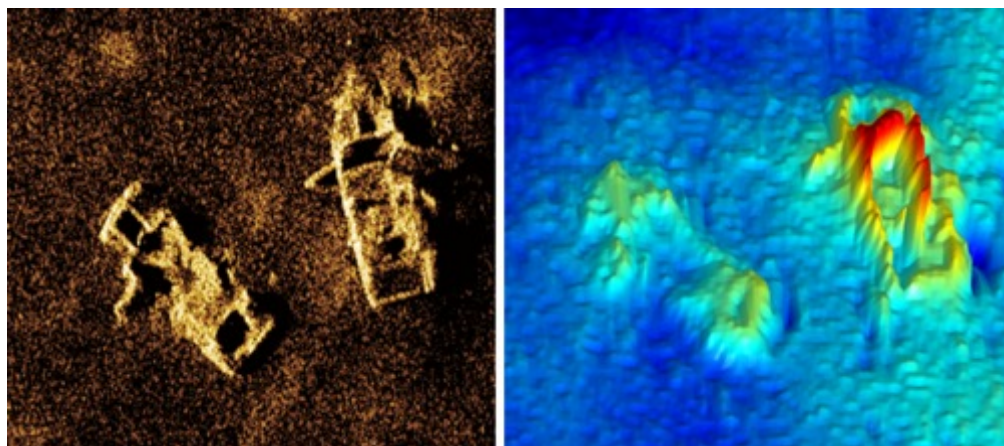


## Sides Scan Sonar vs SAS – Towrope



*Figure 1: Side Scan vs SAS Images*

In addition to improved area coverage rate, Kraken provides this data in real time, without the traditional limitations of extensive post mission processing. Furthermore, all of Kraken’s SAS systems are Interferometric, meaning that they are able to simultaneously provide real-time ultra-high definition SAS bathymetry that is co-registered with the SAS imagery. Through a partnership with Teledyne-owned Caris, Kraken also offers Caris Onboard, an automated hydrographic processing workflow which can combine the imagery and bathymetry into real-time hydrographic databases certified to IHO SP44 standards.



*Figure 2: SAS Image and Bathymetry*

As the company has grown, we have developed additional sensors as well as designed and produced our own UUVs. In addition to selling products, we have a nascent RaaS business.

### 4.2 Principal Markets

The principal market for Kraken’s technology is the maritime robotics market which consists of defense contractors, national defense agencies, research institutions, oil and gas customers, seabed mining

companies, search and salvage companies, and survey companies – both national and international. Today, these customers map the seafloor for many applications. Our perception of the ocean floor has expanded through the use of 3D geospatial applications. However, most 3D bathymetry maps that historically represent continuous global seafloor coverage are artist renditions. It was not until recently that concerted efforts have been made to compile sonar bathymetric data in the public and classified domains to produce higher-resolution 3D digital terrain models of the seafloor.

While the underwater robotics industry has multiple market segments, the military is currently the largest in terms of annual spending and in active robotic assets. The three main applications of underwater robotics for the military are mine counter measures (“**MCM**”); intelligence, signals intelligence, reconnaissance (“**ISR**”), and anti-submarine warfare (“**ASW**”).

In recent years, there has been a resurgence in underwater warfare as well as an emerging market in seabed warfare driving demand for unmanned systems. Key drivers include a mine warfare upgrade cycle, anti-submarine warfare, and the emergence of China in the underwater domain. The recently passed US Department of Defense budget (US\$717 billion) showed the total unmanned systems budget growing rapidly but still just 1.5% of its overall fiscal 2019 budget. The allocation for UMS in the U.S. Department of Defense fiscal 2019 budget is US\$1.3 billion.

Traditionally the industry has been characterized by high costs for bespoke custom designs, low reliability, and high product life cycle costs due to products being expensive to operate and maintain. Industry pioneers and their government sponsors spent billions of dollars on AUVs, ROVs, and sensor development. With technology evolution, better endurance, miniaturization, and enhanced payloads, product capabilities and reliability have improved, pricing has declined and adoption is increasing. Buyers of the technology have increased confidence that AUVs, ROVs, and other underwater robotics equipment can perform serious missions without failing.

In the commercial market, various segments use underwater robotics for data capture and data analysis. These include cable & pipeline survey, subsea infrastructure monitoring, inspection repair & maintenance, hydrography and seabed mapping, search locate and recovery, treasure hunting & salvage, offshore wind wave and tidal farms, seafloor mineral extraction, ocean science, environmental monitoring, and marine archeology. In the oil and gas and offshore wind sectors, maintenance of existing infrastructure is major driver for underwater sensors and robotics.

Kraken’s growth will come from industry growth, an expanding product offering, and increasing market share. The maritime robotics market is expected to be a \$5 billion market by 2020. Many industry forecasters believe the underwater drone industry is positioned where the \$10B+ aerial drone industry was in late 1990s. That is, the industry is at an inflection point to greater adoption and growth driven by multiple drivers. These drivers include: military cutbacks for ‘dull, dirty, dangerous’ human tasking; an industry upgrade cycle in MCM applications; offshore oil and gas migrating into deeper water; growth of offshore wind; increasing interest in ocean mining; improved sensor performance / resolution; emerging opportunities in the Arctic; deep-sea asset recovery operations; increasing interest in ocean science. All of these market drivers result in increased demand for improved sensor performance and resolution on underwater platforms increases.



### 4.3 Product Development Strategy - Sensors to Systems

Kraken's product offering has evolved from 'sensors to systems' to supply vertically integrated, turnkey seabed survey solutions (sensors and vehicles) into the global defense and commercial AUV and ROV markets. Leveraging a strong background in developing sensors, Kraken is moving up the food chain, expanding its addressable market, increasing average selling prices, and capturing greater margin.

Kraken's product development has been a combination of in-house but also increasingly partnering in other geographies along with selective M&A opportunities. Key investment strategy developments over the last 36 months include:

- In 2015, Kraken acquired technology and intellectual property from Marine Robotics Inc., which is being leveraged into underwater robotics products such as KATFISH™ and THUNDRFISH.
- In 2015, Kraken announced development of its KATFISH™ actively controlled towfish product, the first new product step in the Company's migration to a systems company.
- In December 2016, Kraken announced the establishment of its new German operations through KRG. KRG will be a key part of Kraken's product development, sales, services and support efforts. KRG's initial focus will be on a new 3D imaging sensor for the oil and gas market.
- In May 2017, Kraken made a strategic investment in ENITECH Subsea GmbH of Rostock, Germany, which was subsequently renamed "Kraken Power GmbH". Under the agreement, Kraken took a 19.9% equity interest in KPG and provided a 3-year convertible loan which if converted, would increase Kraken's ownership in KPG to 75%. This investment gave Kraken access to specialized deep sea components (batteries, battery management systems, thrusters, drive electronics) which could significantly reduce the bill of materials costs for its ThunderFish® AUV as well as have significant external commercial market sales.

### 4.4 Principal Products and Services

The Company's products can be characterized in two categories: sensors and systems for underwater vehicles. The Company's principal sensor product is its SAS technology, which produces ultra-high resolution (3 cm) images at ranges far superior to conventional sonar technology. Our SAS systems are commercially available under the AquaPix® name and customized to seamlessly integrate into each customer's underwater vehicle. These products are primarily designed for use onboard AUVs, remotely operated tow vehicles, ROVs and tow bodies.

#### *What is SAS?*

SAS is a powerful imaging technique that coherently combines echoes from multiple acoustic pings along the trajectory of an underwater robot to construct a 'synthesized' sonar array. When synthetic aperture techniques are applied at sufficiently low acoustic frequencies, a modest-sized SAS can generate imagery with a constant azimuth resolution comparable to that of higher frequency sonar systems, but with significantly longer range.

Interferometric SAS ("INSAS") is strongly related to its airborne cousin – interferometric SAR ("INSAR"). While INSAR has transitioned into a commercial off-the-shelf product, INSAS has for a long time remained at the research stage. Some of the reasons for this delay have been the challenges in





obtaining very high navigation accuracy through the ocean, as well as the high-computational cost of SAS imaging software. INSAS uses sophisticated signal processing techniques to compare the multiple observations of the same area of seafloor to calculate its depth. The image resolution of the seabed is significantly increased – often by an order of magnitude - compared to conventional sonar technology. INSAS systems can achieve image and bathymetry resolutions of a few centimetres even in very deep waters and at very long ranges.

INSAS hardware (transducer arrays and electronics), image processing and INSAS processing have been a research topic at the NATO Undersea Research Centre in La Spezia, Italy for many years. The introduction of hydrodynamically stable UUVs, cheaper and more powerful data collection and processing electronics, combined with advanced micro-navigation and auto-positioning methods has recently brought INSAS forward as a viable alternative to SSSs and multibeam echo-sounders for seabed imaging.

### ***Kraken's SAS History***

Kraken's AquaPix® hardware development commenced in January 2011 (at a previous company) with the first major sea trial occurring in August 2012. Kraken's INSAS signal processing software, 'INSIGHT', was developed in parallel.

Kraken's SAS technology has been tested by various strategic industry partners including Defence Research and Development Canada, the United States Navy's Sea Systems Command and the United Kingdom Ministry of Defence. A successful cooperative research and development agreement with the Naval Underwater Warfare Center ("NUWC") in Rhode Island in 2013 was a key validation point for Kraken's SAS technology.

### ***AquaPix® INSAS***

While conventional sonars are commonly used for seafloor imaging and bathymetry, they suffer from range and resolution limitations. However, these limitations are overcome by using INSAS systems such as those designed and manufactured by the Company.

The Company's ultra-high resolution INSAS with 3D bathymetric capabilities is called AquaPix®. AquaPix® is capable of providing detailed images with an along-track/across-track resolution better than 3 centimetre out to a range of 300 metres from each side of an underwater vehicle (600 metre swath). It can also produce bathymetric data with a resolution better than 25 centimetre out to full range while delivering very high depth accuracy, in compliance with IHO S44 special order requirements.

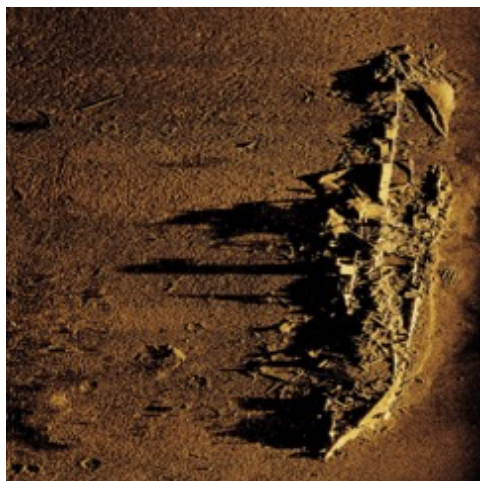
In addition to being used for military applications such as naval mine countermeasures, INSAS is a multi-market technology with great potential for offshore oil and gas surveying, hydrographic surveys, underwater archaeology, benthic habitat mapping and deep-sea mining. With high resolution INSAS it is possible to use image fusion techniques to combine the bathymetric data with the reflectivity data to create a real-time 3D representation of objects on the seabed. The ability to generate centimetre-scale resolution in all three dimensions has the potential to provide significant improvements in the detection, classification and identification of small seabed objects.



### ***Miniature Interferometric Synthetic Aperture Sonar (“MINSAS”)***

In 2014, Kraken announced the AquaPix® MINSAS, a next generation MINSAS designed for smaller diameter AUVs. MINSAS is optimized for the demanding size, weight, power and cost constraints of AUVs, is based upon a proven military design, and is ideal for a variety of seabed imaging and survey missions. The MINSAS payload section also includes Kraken’s latest generation Real Time SAS Processor, the RTSAS MK-II. The RTSAS enables real-time, onboard processing of SAS imagery and bathymetry, and allows operators to leverage Kraken’s suite of post-processing tools, including the newly developed SASView 3D visualization and control software.

Since then Kraken’s MINSAS sensors have been used by numerous customers including Defence Research and Development Canada (deployment in the Franklin Expedition search of 2014), Woods Hole Oceanographic Institute (WHOI), DSTO, Elta Systems, ECA Robotics, Fraunhofer, Atlas Elektronik, Lockheed Martin, OI and others.

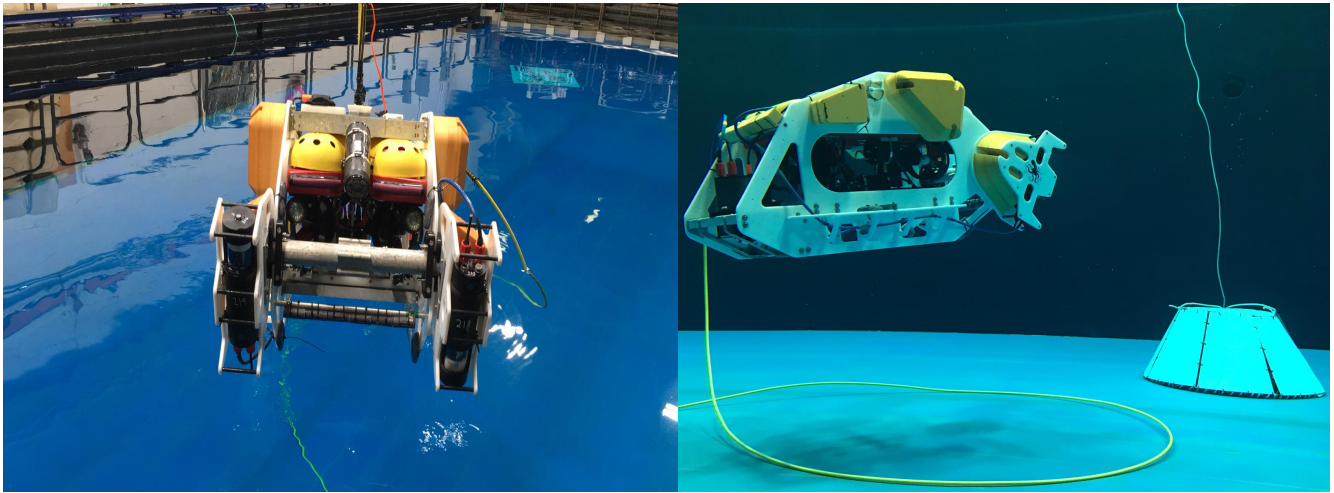


*Figure 3: SS Ferrando Shipwreck Imaged by Kraken SAS (courtesy of ECA Robotics)*

### ***SEAVISION® 3D Underwater Imaging System***

SeaVision® was developed by KRG with support from Kraken engineers in Canada. It is the world’s first RGB underwater laser imaging system that offers the resolution, range and scan rate to deliver dense full color 3D point cloud images of subsea infrastructure with millimetre accuracy in real time. It operates in a twin pod configuration with each pod having three steerable laser lines, camera, and LED lights producing high-resolution point clouds in unprecedented scan speed and co-registered video data. The concentrated light source provides greater visibility even in high turbidity. SeaVision® can be operated in 2 modes, rotating the laser (a.k.a. scanning) or lasers in a fixed position (common approach provided by most laser suppliers, a.k.a. profiling)





*Figure 4: SeaVision® twin pod configuration as mounted on an ROV*

Equipped with a high-resolution camera and laser, the system allows operators to reconstruct objects on the seabed in such a way that detailed models can be subsequently produced for 3D visualization. Its 3D imaging capabilities include generation of geo-registered ‘as-built’ models of structures on the seabed or in the water column, survey of subsea infrastructure and comparison against baseline models and detection of structural defects or other out-of-spec conditions that exceed threshold values.

The ability to generate accurate 3D reconstruction of underwater infrastructure is an important requirement for commercial, military, and ocean research applications. While sonar is the technology of choice for covering large areas, 3D laser systems such as Kraken’s SeaVision® provide significantly higher resolution and accuracy at inspection ranges of under 10 metres. The initial SeaVision® system is designed for deployment on underwater robotic platforms such as Remotely Operated Vehicles (ROVs) and AUVs. Kraken has seen significant interest in SeaVision® from customers across many industries from defense to oil and gas, to renewable energy and nuclear. While this is a new product for Kraken, notable customer developments in the last 12 months are as follows:

- In April 2017, KRG was awarded a contract to design and build a 6,000-metre rated 3D laser/optical imaging system for the prestigious Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research (AWI) in Bremerhaven, Germany. The custom version of the SeaVision® system for AWI’s crawler was successfully delivered in Q3 2017.
- In September 2017, KRG was awarded the Go-3D prize for its SeaVision® system presented by the Fraunhofer Institute for Computer Graphics Research in association with BITKOM, the German Association for Information Technology, Telecommunications and News Media. The award was established to recognize outstanding technical achievement in the field of 3D visualization.
- In November 2017, Kraken was awarded a contract by Petroleum Research Newfoundland and Labrador for the development of underwater sensors and robotics using SeaVision®. In partnership with Avitas, a GE Venture company, the parties will to develop technology to advance digitalization of integrated operations with Newfoundland and Labrador’s oil and gas sector.

- In June 2018, Kraken was notified by the Government of Canada that Kraken's SeaVision® underwater 3D laser imaging system has been pre-qualified for the Build in Canada Innovation Program ("BCIP"). This is the second BCIP application that Kraken has had pre-qualified by the Government of Canada. Through the BCIP, companies can sell their pre-qualified innovations to the federal government as their first reference sale. Kraken expects its test partner to be Parks Canada which will test SeaVision® on marine archaeology projects. The BCIP program pays up to C\$500,000 for non-military innovations. Due to a backlog with the government contracting agency, Kraken now expects this contract will not be finalized until the first half of 2019.
- In June 2018, KRG, secured over \$900,000 in contracts for two development initiatives for evaluation of SeaVision® sensors and artificial intelligence control software for AUV. The two projects, ARIM and RoboVaaS, are collaborative research activities funded by the German Federal Ministry for Economic Affairs and Energy as part of the MarTERA Horizon 2020 initiative of the European Commission. Both projects will use Kraken's innovative SeaVision® sensor for monitoring and inspection services and autonomous vehicle control. The ARIM project, focused on subsea monitoring with a crawler system. Under this program, Kraken software and SeaVision® sensor will be used to control an underwater autonomous surface vehicle. Kraken's main funded activity is in the area of control and artificial intelligence. RoboVaaS is a 'robotic vessels as a service' project. Kraken's contribution will focus on shiphull inspection with software for sensor processing. The contracts started in June 2018 and continue over a period of 36 months, with Kraken receiving approximately two-thirds of the funding over the next 18 months.
- In July 2018, Kraken received first commercial order of standard SeaVision® product for a European customer. Product shipment is expected in Q4 2018.
- In September 2018, Kraken completed a trial with a large offshore oil and gas company whereby SeaVision® was used for mooring chain inspection. The company expects an additional mooring chain inspection trial in Q4 with another large offshore oil and gas company.

### ***AQUATRAK® Correlation Velocity Log (CVL)***

Kraken AQUATRAK® CVL product is a speed sensor derivative of Kraken's SAS technology. It is targeted at the oil and gas sector for ROVs. Tritech, a division of MOOG, is the exclusive channel to market for this product. Kraken developed the design, but Tritech will be responsible for manufacturing, marketing and sales, and Kraken will receive a royalty for each unit sold by Tritech.

### ***KATFISH™ Intelligent SAS Towfish – Real time 3D seabed mapping***

Kraken kicked off the next stage in its sensors-to-systems strategy in 2015 through the start of development of the KATFISH™ actively stabilized towed SAS towfish product. The Company believes KATFISH™ is an industry game-changer for high-resolution seabed mapping. It is an actively stable towed SAS for manned surface vessels or USVs. Built upon Kraken's proven, real-time SAS technology, KATFISH™ reached commercial release in 2018. Its advanced hydrodynamic control system allows for bottom following, terrain referencing and obstacle avoidance. The full system includes cable, towbody and operator's console. The KATFISH™ sells for US\$1.5 million with a hardened military version priced at US\$2.5 million. Key operating metrics include:

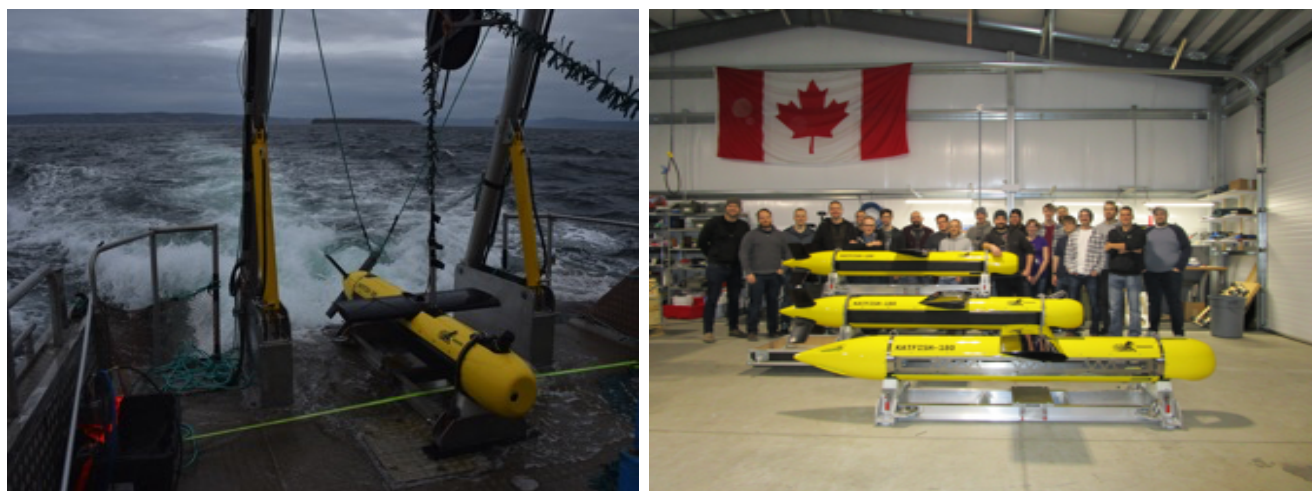




- High-speed (up to 10 kts) actively controlled towbody, tightly integrated with Kraken sensor payloads
- MINSAS180 with gap filler
- Resolution: 3cm x 3cm
- Swath width: >440 metres
- Operating Depth: Up to 300 metres
- Commercial and Military Certified

In May 2018, Kraken announced that it had successfully completed military standard certification testing of the KATFISH-M, a ruggedized version of Kraken's KATFISH™ Towed Synthetic Aperture Sonar Platform. KATFISH-M was tested and certified by independent laboratories on a variety of United States Department of Defense military ruggedization standards known as MIL-STD-810G and MIL-STD-461. The MIL-STD-810G focuses on environmental engineering and requires products to pass a series of laboratory tests to ensure that military equipment can operate in extreme worldwide environments. The MIL-STD-461 standard covers the requirements and test limits for the measurement and determination of the electromagnetic interference characteristics (emission and susceptibility) of electronic, electrical, and electromechanical equipment.

Kraken is seeing significant opportunity for KATFISH™ across a range of markets and geographies. The Company has delivered two KATFISH™ to non-North American customers and has a third system being used for demonstration purposes. Recent successful demonstrations were completed in the U.S in August of this year at the Advanced Naval Technology Exercise ("ANTX") as well as under cooperative research and development agreements (each, a "CRADA") with NUWC and National Oceanic and Atmospheric Administration ("NOAA"). Kraken is involved in multiple foreign navy MCM bids in partnerships with various large defense prime contractors. Several of these navy MCM bids are expected to progress to contract award in 2019.



*Figure 5: KATFISH™*

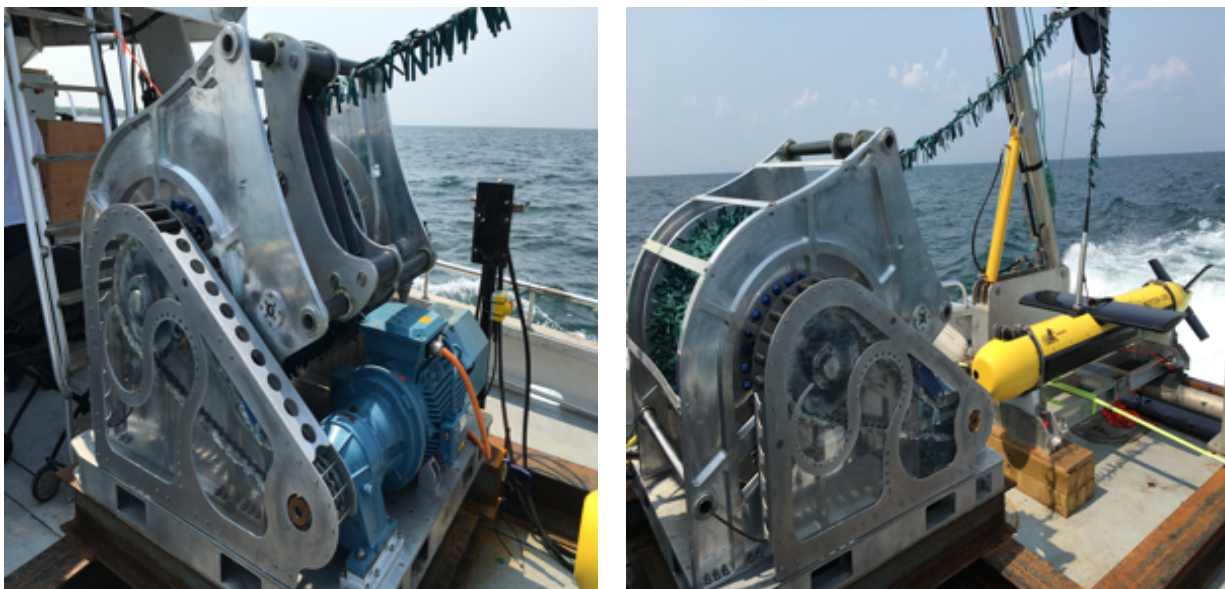


## ***Tentacle® Winch and Launch and Recovery Systems (LARS)***

In 2016 Kraken established a Handling Systems Division (“HSD”) in Dartmouth, Nova Scotia, to design and manufacture Autonomous Launch and Recovery Systems (“A-LARS”) for Manned and Unmanned Maritime Vehicles. The team, formerly employed at Rolls-Royce Naval Marine have extensive experience and were responsible for the development of advanced launch and recovery systems used by a wide variety of military, commercial and ocean science customers. Launch and recovery is one of the highest risk operations undertaken in the application of towed or autonomous underwater vehicles. The primary function of an autonomous launch and recovery system is to enable an unmanned vehicle and its payloads to be brought aboard a host ship safely, efficiently and without damage.

Next-generation surface vessels will carry a variety of unmanned vehicles and modular mission packages that will require specialized launch and recovery equipment. The team in Halifax will design winches and LARS systems for both the KATFISH™ as well as future AUV and ROV products and also undertake custom design work for third parties. These LARS systems are expected to range in price from \$750,000 to \$1 million. In addition, Kraken’s Handling Systems Division expects to work with KRG and other partners for subsea docking and residence applications as these technologies gain traction in the underwater vehicle market.

In August 2018, Kraken’s Tentacle® electric winch was successfully fielded demonstrating KATFISH™ at ANTX in Rhode Island as well as under CRADAs with NOAA and NUWC. Tentacle® is a highly intelligent electric winch which can adjust cable scope through active feedback from underwater towed platform. It forms the starting point for a complete LARS system as is available for sale as of Q3 2018.



*Figure 6: Tentacle® Winch and KATFISH™*

## ***Deep Sea Pressure Tolerant Batteries, Thrusters, and Drives***

Based in Rostock, Germany, KPG designs and manufactures unique pressure tolerant thrusters, drives, batteries, battery management systems, and electronics. These are specialized deep-sea components for AUVs and ROVs. KPG’s unique pressure tolerant gel encapsulation technology for lithium polymer

batteries provides an attractively priced, eco-friendly and superior alternative to oil compensated batteries currently used for subsea battery applications.

This durable silicone polymer encapsulation remains flexible, yet stable under pressure. This method of encapsulation allows Kraken to reduce the size and weight of traditional subsea battery packs by not requiring the cells to be located inside pressure housings or flooded with oil. As such, the battery design is no longer constrained by dimensions of the pressure or oil housings. They can now be contoured to better fit the shape of the vehicle, which improves packing efficiency and increases volumetric density. Ultimately, this technology reduces the size and weight of high-density battery packs for underwater vehicles and dramatically reduces the cost and weight versus traditional subsea batteries. Kraken Pressure Tolerant Battery Systems are modular and can be connected in banks to meet the vehicles voltage and capacity requirements. Each pack is individually rated to 6000 meters and contains its own Battery Management Systems (BMS).

Since being re-capitalized, KPG has successfully restarted operations and is seeing strong international interest in its pressure tolerant encapsulation technology and products from companies providing equipment to the offshore oil and gas market as well as major defense contractors.

In August 2018, Kraken announced that OI has agreed to purchase \$9 million of Kraken's deep-sea batteries with delivery dates expected between Q4 2018 and Q4 2019. Kraken will arrange for these batteries to be built by KPG. The first purchase order has been issued for \$2.5 million and the subsequent purchase order of \$6.5 million is expected in early Q1 2019.

OI noted that by using Kraken's battery technology, "we can increase our energy capacity by over 50% in the same physical form factor as our existing conventional batteries. From an operational perspective, this gives us considerable flexibility to optimize mission plans, increase area coverage, manage weather impact and ultimately increase value for our customers."

Kraken expects to exercise its right to increase its ownership position in KPG to 75% in the second half of 2018.



*Figure 7: Deep Sea Batteries, Thrusters, and Drives*

## ***Anti-Submarine Warfare***

In July 2018, Kraken established its Acoustic Signal Processing Group (“**ASPG**”) in Toronto, Canada. This 4-person team of senior scientists and engineers brings 80+ years of experience in sonar system development and integration. The team’s core competency is in implementations of signal processing and user interface software for sonar applications.

Kraken’s ASPG team has been responsible for the development and in-service support of a number of military sonar systems including post-analysis, shipboard processing, harbour surveillance and operator team training applications. From 2002 to 2017, they have delivered major projects to the navies of Canada, Sweden, and Germany. We expect this group to be profitable during the first year of operations and Kraken plans to leverage our business development efforts into additional contracts wins. In September 2018, Kraken’s ASPG team was awarded their first contract from an international defence contractor valued approximately \$1.0 million.

## ***Robotics as a Service***

Kraken believes that certain customers would prefer to hire the Company to provide product output (i.e. imaging and bathymetry data) to them using the Kraken’s own equipment, rather than the customer buying the equipment and having to own, operate, and maintain the equipment. This is the genesis of Kraken’s RaaS offering.

In 2017, the Company was awarded its first RaaS contract by OEX Recovery Group Incorporated, to conduct a search for nine Avro Arrow free flight models launched over Lake Ontario in series of tests during 1954 - 1957. The models are one-eighth scale replicas of the famed flying jet, and were part of the final flight design tests done prior to the production of the CF-105 Arrow. The goal of the search was to discover the resting place of nine models, recover them and ultimately house them at the Canada Aviation and Space Museum in Ottawa and the National Air Force Museum of Canada in Trenton, Ontario.

Using Kraken’s ThunderFish® underwater robot, the search for the lost Avro Arrow test models occurred in the second half of 2017 and Kraken generated revenues of approximately \$0.5 million on this contract. The search generated significant national and international media interest when the successful discovery of a free-flight Avro Arrow model on the floor of Lake Ontario was announced September 8, 2017.

While no RaaS revenue was recognized in the first half of 2018, Kraken is bidding on opportunities involving both shallow and deeper water surveys with both KATFFISH™ and ThunderFish®. Kraken believes its recent memorandum of understanding with OI could result in a significant uptick in RaaS revenue in time in partnership with companies like OI.

Kraken expects RaaS to become a growing part of its revenue mix over time. Kraken will provide RaaS services to customers using Kraken’s KATFISH™ towed underwater vehicles and ThunderFish® AUV. As seen below, Kraken has branded its RaaS offering as SeaScout®, a complete seabed mapping and intelligence solution.







**seascout**  
SEABED MAPPING & INTELLIGENCE

**KRAKEN**

## High Speed Synthetic Aperture Sonar for Underwater ISR

- **Tightly Integrated System Solution**  
SAS / Towbody / Intelligent Winch / LARS
- **UHD Resolution At Long Range**  
3x3 cm imagery, 6x6 cm bathymetry  
440 m swath with full resolution
- **Exceptional Area Coverage Rate**  
3km<sup>2</sup> @ 8 knots tow speed
- **Rapid Deployment**  
Complete system fits in 20' ISO container
- **Superior Price / Performance Value**  
Purchase or contract as a service  
COTS or MIL-STD certified

[www.krakenrobotics.com](http://www.krakenrobotics.com)

40 60 80 100 120 140 160

Figure 8: SeaScout® RaaS Offering

### ***Former Non-Core Development Initiatives***

#### *Strategic Investment in Square Robot Inc.*

In 2016, Kraken announced a partnership with Boston-based Square Robot Inc. (“SRI”) to target a significant market for Kraken products in oil and gas infrastructure inspection. Based in Boston, SRI is a private company formed in 2016 to provide services for confined area inspection using hovering robots. The founders are senior tenured employees from Bluefin Robotics (acquired by General Dynamics in February 2016).

The partnership goal was to jointly develop small hovering robots for oil and gas inspection (confined area inspection) applications. Kraken was to be the exclusive manufacturing partner to SRI and SRI would be the service provider to the end customer (oil and gas companies). Kraken supplied initial seed funding to SRI, but due to several factors, sold its ownership position in 2017 for a gain of approximately \$0.8 million. While Kraken has the technical capabilities and customer relationships to address this market, the company lacks the bandwidth to address additional resources in this direction at the current time.

## **4.5 Research and Development**

Kraken employs 42 engineers, technologists, and scientific staff devoted to R&D, including 7 staff members with PhD degrees. Of these, 35 work in St. John’s, Dartmouth, Toronto, and Ottawa. In



Newfoundland, the company operates its manufacturing and test facility in Conception Bay South in close proximity to the Marine Institute Holyrood Base. Kraken assembles and tests all sonar systems and unmanned vehicles in its CBS facility and conducts regular sea trials in Conception Bay with convenient access to a variety of water depths and bottom types.

In St. John's, the company has access to specialized test facilities at the Marine Institute, Memorial University of Newfoundland, and the National Research Council Ocean Coastal and River Engineering Research Centre. Kraken's Dartmouth office is located in the Centre for Ocean Ventures and Entrepreneurship (COVE) facility with direct access to Halifax harbor for research and development.

Kraken is recognized as a world leader in underwater technologies, and Kraken's engineering team has successfully brought several products from initial concept, prototyping, engineering test and evaluation (T&E), and ultimately to commercialization. Kraken has demonstrated success of managing the transition of products from R&D to commercial production using in-house resources.

Continuous research and development is needed to help the Company stay ahead of the competition. To help fund research and development, Kraken has received funding contributions from government agencies including the National Research Council of Canada Industrial Research Assistance Program ("NRC-IRAP") and Newfoundland's Research and Development Corporation's ("RDC") SensorTECH initiative. These contributions have and will continue to enable Kraken to accelerate the development of next generation underwater robotics equipment for both military and commercial applications. We detail contributions to Kraken to date:

- In March 2015, the Company was awarded a non-refundable financial contribution of up to \$450,000 from the NRC-IRAP. The funding was being used to develop a real-time, ultra-high-resolution seabed mapping system that is based on Kraken's INSAS technology, real-time SAS signal processing algorithms and coupled with an onboard version of advanced 3D seabed visualization software.
- In November 2015, Kraken announced it had been awarded a grant of \$750,000 by the RDC for the development of KATFISH™ Sonar Towfish platform.
- In February 2016, the Company was awarded a non-refundable financial contribution of up to \$495,000 from the NRC-IRAP to be used for the development of the KATFISH™ (the Kraken Active Towfish for high speed, high resolution seabed mapping. The system will enable real-time seabed imagery, bathymetry and advanced 3D digital terrain models of the seabed and are optimized for both manned and unmanned surface vessels.
- In November 2016, the Company was awarded a non-refundable financial contribution of up to \$485,000 from the NRC-IRAP to be used to develop A-LARS for UUVs. The initial A-LARS is being designed to support Kraken's KATFISH™ Synthetic Aperture Sonar underwater towbody.
- In March 2017, the Company was awarded a non-refundable financial contribution of up to \$1,470,000 from the NRC-IRAP to be used to support the development of Kraken's underwater robotics program, which involves development of a technology demonstration platform. The first phase of the program will utilize the Fraunhofer Institute's DEDAVE AUV as the base platform. The AUV will be enhanced with hydrodynamic, control system and payload upgrades.



- In May 2017, the Company was awarded a grant of \$745,950 from RDC for the development of Kraken's ThunderFish® AUV program. The ThunderFish® program will combine smart sonar, laser and optical sensors, advanced pressure tolerant battery and thruster technologies and cutting edge artificial intelligence algorithms integrated onboard a cost effective 6,000-metre depth rated AUV.
- In November 2017, the Company entered into a commercial contract with Petroleum Research Newfoundland and Labrador ("PRNL") that includes funding from General Electric Oil and Gas and Innovate Newfoundland and Labrador. As part of this agreement, a non-refundable financial contribution from Innovate Newfoundland and Labrador of \$248,324 will be received. Kraken is working with General Electric Oil & Gas to merge Kraken's next generation sensors and underwater robotics, with GE Avitas Systems' cloud-based data analytics infrastructure, demonstrating an end-to-end digitized concept of operations for subsea asset integrity management.
- In August 2018, Kraken announced that it has signed a CRADA with the U.S. Navy's NUWC – Division Newport. Kraken recently completed successful testing of the KATFISH™ with NUWC off of Rhode Island. At the end of August, Kraken showcased its KATFISH-M at the ANTX in the United States. ANTX is an annual, invitation-only event that was created by the U.S. Navy to see the future of naval technology in action today.

Kraken will continue to apply for available government funding and work with partners to supplement its internal financing efforts for new product developments in the areas of sensors, underwater vehicles, and a powerful suite of visualization and data analytics software tools for interacting and manipulating datasets from Kraken and third-party sensors.

### ***ThunderFish® AUV***

In March 2015, the Kraken delivered a deep-sea rated INSAS system to Germany's Fraunhofer Institute for Optronics, System Technology and Image Exploitation ("IOSB"), the leading organization for applied research in Europe. Under the terms of the contract, Kraken designed, engineered and delivered a 6,000-metre depth rated AquaPix® MINSAS sonar system that was integrated into Fraunhofer IOSB's DEDAVE AUV program.

Fraunhofer is the largest organization for applied research in Europe with 69 institutes, over 24,500 employees and a €2.1 billion annual budget. From 2012 to 2015, Fraunhofer had been developing intellectual property and technology related to underwater robotics. Over C\$6 million has been invested in Fraunhofer's underwater sensor robotics programs, culminating in the development of the DEDAVE.

Kraken continues its ThunderFish® Hovering-AUV (H-AUV) development program. Our mission is to create a more versatile and compact AUV that is easier to handle than existing systems, while providing more space for payloads, and fast turn-around times. Versatile payload options and a modular battery system allows ThunderFish® to be adaptable to many different AUV missions of varying depths, duration, and applications.





*Figure 9: ThunderFish® AUV*

The ThunderFish® AUV is a technical upgrade of the Fraunhofer's DEDAVE AUV, however is still a prototype. Kraken will pay Fraunhofer a royalty based on a percentage of each sale with minimum commitments starting in 2022. Kraken is exclusively licensing Fraunhofer software and hardware intellectual property and technology for large AUVs.

In June 2017, the Company took delivery of the 6000-metre rated DEDAVE AUV which Kraken rebranded ThunderFish® Alpha AUV. This mid-sized AUV is designed for deep sea military, commercial and scientific applications for use as a sensor and robotics technology demonstration platform to support ongoing development of the Company's underwater sensor and robotics programs. Kraken has established a long-term technical co-operation program with Fraunhofer for hydrodynamic control systems, mission planning and autonomy algorithms that can be deployed in Kraken's ThunderFish® AUV program.

In April 2018, Kraken announced that its ThunderFish® 300, a shallow water version of its AUV had been pre-qualified under the Canada's Build in Canada Innovation Program ("BCIP"). Through the BCIP, companies can sell their pre-qualified innovations to the federal government as their first reference sale. After testing a company's innovation, federal departments provide feedback on the innovation's performance in an operational setting. The program pays up to \$1 million for military innovations. While Kraken has finalized the Statement of Work, there have been delays due to a backlog with the government contracting agency. As such, Kraken now expects this contract will not be finalized until the first half of 2019.

Once complete, Kraken expects ThunderFish® to be an industry leading AUV platform offering next-generation performance with technologies such as real-time onboard mapping and target recognition, SAS, Sub-Bottom 3D Volumetric Imaging, SeaVision 3D underwater laser scanning, and other sensors. The ThunderFish® AUV has a targeted commercial list price of \$3 million, which is lower cost when compared to feature rich, commercially available AUV systems on the market today.

### ***Multi-Spectral SAS***

In May 2018, Kraken announced the start of development of a next generation sonar sensor, an ultra-wideband acoustic remote sensing system for seafloor imaging and mapping. The AquaPix® Multispectral Synthetic Aperture Sonar (SAS) will be the world's first commercial SAS to operate over such a wide spectrum, ranging from low audible frequencies to high ultrasonic frequencies. Kraken believes the AquaPix® Multispectral SAS is a true game changer in underwater sensors and will be ideal



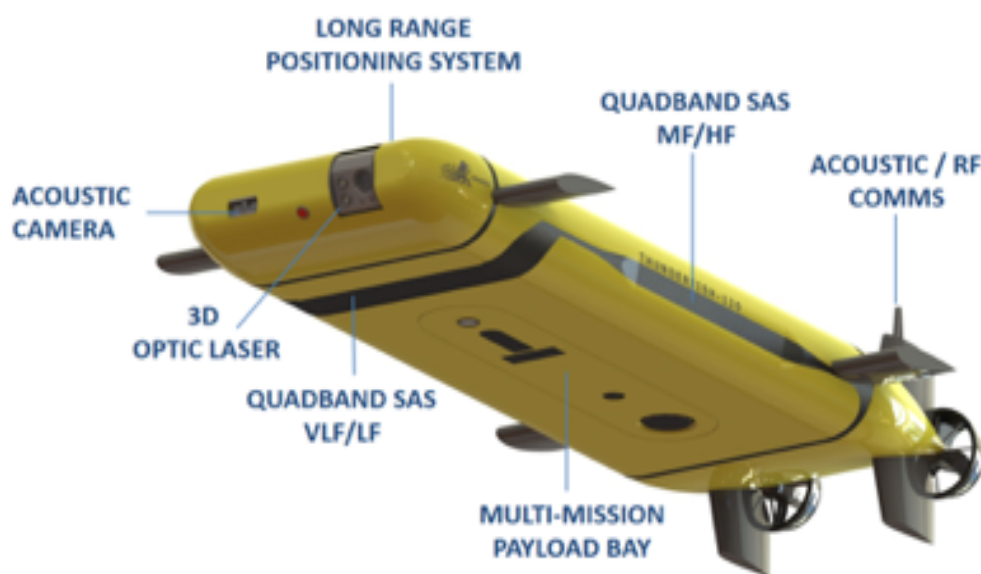


for a wide variety of seafloor imaging and mapping applications. The Multi-Spectral SAS will be developed in partnership with Alba Ultrasound of the U.K. and Dr. Allan Hunter from the University of Bath. Kraken is targeting commercial release of MS-SAS in 2019, with OI as a launch customer. In addition to being available for sale on AUVs from other companies, the MS-SAS will be optimized on Kraken's next-generation ThunderFish® AUV.

There are three notable benefits of this new technology:

- Significantly extended search range at constant high-resolution seabed pixels;
- Sub-bottom 3D volumetric imaging (i.e. finding objects buried beneath the seafloor such as pipelines and communications cables); and,
- Increased speed and accuracy for seabed classification and characterization.

Over the past number of years, multibeam sonar systems have come to dominate the world of marine survey. However, to meet the competing needs of range performance versus resolution, most of these systems only operate at a single frequency (or a very narrow band of frequencies) at any one time. As a result, the seabed and volume scattering products are essentially monochromatic and are typically displayed as a single-color image, representing a single data point for each bottom location. In contrast, Kraken's AquaPix® Multispectral SAS collects multispectral data at several frequency bands widely spaced from 5 kHz to 200 kHz. The broadband SAS provides much more data with significantly improved range and resolution.



*Figure 10: Multi-Spectral SAS on ThunderFish®*

### ***JellyFish Hybrid AUV/ROV***

Leveraging original investment by KPG, JellyFish is a 6000-metre rated hybrid AUV/ROV. JellyFish will include Kraken's SeaVision® laser scanner sensor and could be targeted at offshore windfarm infrastructure inspection as well as an integrated solution for ship hull scanning. Kraken is targeting 24



months of development with a commercial product release in 2020. Kraken has applied for European government funding to pursue development of JellyFish.



*Figure 11: JellyFish Hybrid ROV*

#### **4.6 Intellectual Property**

The Company's success depends in part upon its ability to protect its intellectual property. To accomplish this, the Company relies upon a combination of intellectual property rights, including patents, copyrights, trademarks, and trade secrets in Canada, the United States, and in select foreign countries where it believes filing for such protection is appropriate. The Company has registered several trademarks with respect to its products and services. The Company has filed for patents in the area of certain hardware developments. The Company protects its proprietary source code and algorithms as trade secrets by limiting access to such proprietary source code and algorithms and its other know-how, trade secrets and intellectual property to employees who have a need to know such information. Further, each employee and consultant of the Company has agreed in writing to maintain the confidentiality of its know-how, trade secrets and other intellectual property. Kraken's Intellectual Property lawyers are Toronto-based Perry + Currier Inc. Mr. Shaun McEwan, a Kraken Director since 2016 is the Chief Financial Officer of Quarterhill, Inc., which owns WiLAN, a leading intellectual property licensing company.

#### **4.7 Customers & Sales and Marketing Strategy**

Kraken products have been successfully qualified since 2013 by customers in more than 10 countries. Kraken is leveraging its defense markets wins to move into other markets including oil & gas, commercial survey, ocean mining and search & salvage. Customers include DRDC (Canada), DSTO (Australia), NAVSEA (US), Boeing (US), Lockheed Martin (US), WHOI (US), Royal Navy (UK), Atlas Elektronik (UK & Germany), Fraunhofer Institute (Germany), Deep Ocean AS (Norway), IAI Elta (Israel), Elbit (Israel), ECA Robotics (France), and Saipem (Italy), amongst others. Kraken's SAS



technology has been integrated on various AUV platforms including the Lockheed Marlin, Hydroid REMUS, ISE Explorer, Fraunhofer DEDAVE, Atlas Sea Otter, ECA A18, MacArtney ROTV, Kongsberg Hugin, and others. To our customers, Kraken products offer the advantages of cost, compactness, performance, and simplicity, resulting in the customer achieving the highest resolution seabed pixels at the lowest cost.

Kraken's products and services are marketed directly by the company as well as through independent agents, consultants and systems integrators. Kraken participates in industry trade shows and its scientists and engineering personnel are actively engaged at the government and university research level.

Kraken has made significant efforts to develop relationships with a number of strategic partners including large defense contractors and commercial companies. Partnerships are a key part of Kraken's growth strategy and bring several benefits including:

- Reduce risk and time to market on new product developments;
- Add to the company's technology platform and intellectual property portfolio;
- Provide an ability to leverage relationships for ongoing low-cost R&D;
- Add relationships with oil and gas and other commercial customers;
- Provides access to world class, low cost facilities for development and testing purposes;
- Provides greater ability to access government funding including cross border funding

Kraken has and will continue to develop international partnerships and pursue multi-sector collaborations to mitigate risk and deliver new products with better performance at a lower price than competitors. For more information on Kraken's partnerships and business activity, see *"General Development of the Business – Recent Development of the Business and Company Milestones"*.

#### **4.8 Competitive Conditions**

The Company competes in a very specialized, niche industry with high barriers to entry. The Company's employees have intimate knowledge of the underwater robotics industry, significant experience in advanced acoustics, deep industry insights and strong relationships with key decision-makers. In addition, Kraken is unique in having design, engineering and manufacturing expertise with both sonar technologies and AUVs.

Kraken sells both sensors and systems in a market with larger competitors, in an industry lacking dominant players, and where consolidation is a theme. In addition, the market is often characterized by 'co-opetition' as companies partner together on larger industry bids. Kraken believes the keys to success are (1) product performance, quality and reliability; (2) technical talent; (3) price competitiveness; (4) strong customer service and support; and (5) funding.

The Company's current products and technology compete in the following market segments:

- SSS – Kraken Sonar's technology competes with SSS products, which provide lower resolution images and smaller coverage areas relative to the Company's SAS technology. While pricing for



its SAS technology is at a premium to the SSS alternatives currently on the market, the Company believes that the performance of its SAS technology makes it the superior choice from a price-performance perspective. Kraken's major competitors in this market segment are Edgetech, Sonardyne International Ltd., Klein Marine Systems Inc., and Marine Sonics;

- SAS – Kraken Sonar's technology competes with other manufacturers of SAS products, including Kongsberg Gruppen ASA (Norway), iXBlue Limited (France), Northrop Grumman (US), the Thales Group (France), and Raytheon Company (US). Unlike the Company, the majority of competitors do not sell their SAS products as stand-alone products, but rather sell them only as a component part of a UUV, meaning that the cost of acquiring SAS products from these competitors can run into the millions of dollars. Further, the Company's SAS product currently sells at a discount to comparable stand-alone products sold by larger competitors. Kraken also believes the ability of its systems to do real time data processing onboard the underwater vehicle is a competitive advantage and significantly reduces post mission processing times versus the competition. The end result is better data, quicker, and cheaper.
- Laser scanner – Kraken's SeaVision® laser scanner competes with offerings from 2G Robotics, Cathyx Ocean, and 3D at Depth. The Company believes its competitive advantage with SeaVision® includes the superior speed of under 4 seconds for a full resolution scan, real-time processing for immediate analysis and full-color vision using RGB lasers. Furthermore SeaVision® does not include any externally moving parts and is therefore optimally suited for ROV mounting and operation in challenging industrial inspection activities.
- Towfish underwater vehicle – The Company's KATFISH towbody product competes in a market segment with 4-5 competitors. KATFISH is a high-speed (8 knots) active towbody, with tightly integrated Kraken sonar payloads. Competitor products in this segment include the Klein 5900, Raytheon AQS-20A, Northrup AQS-24A, and Thales T-SAS. Competitive factors include range, resolution, area coverage rate, price, real time SAS processing capabilities, bathymetry, ITAR controlled and other factors. Kraken's competitive advantage with KATFISH includes: speed, price, performance (most advanced active towfish on the market), and the fact that our products are non-ITAR.
- Deep sea batteries – In this niche market, KPG competes with companies such as Bluefin (General Dynamics), Southwest Electronic Energy Group, and General Atomics. Kraken believes its pressure tolerant gel encapsulation technology allows customers to increase power density at lower costs than competitor products.
- AUVs – There are multiple competitors in the AUV market but Kraken's ThunderFish® is targeted at the large AUV category. In this segment, notable companies include ISE, Bluefin, Kongsberg, Atlas Elektronik, ECA Robotics, Lockheed Martin, Saab, and Hydroid. As a vertically integrated supplier of sensors and systems, Kraken believes it is well positioned to develop ThunderFish® into a high performance reasonably priced competitor in the AUV market.





## ITEM 5: RISK FACTORS

Prior to making an investment decision investors should consider the investment risks and uncertainties set out below and those described elsewhere in this document, which are in addition to the usual risks and uncertainties associated with an investment in a business at an early stage of development.

The directors of the Company consider the risks and uncertainties set out below to be the most significant to potential investors in the Company; however, these are not all of the risks and uncertainties associated with an investment in securities of the Company. Additional risks and uncertainties not presently known to the Company, or that the Company currently deems immaterial, may also impair its operations. If any such risks actually occur, the assets, liabilities, financial condition, liquidity, results of operations (including future results of operations), and business and business prospects of the Company could be materially adversely affected and the ability of the Company to implement its growth plans could be adversely affected.

An investment in the Company's Common Shares is speculative. An investment will be subject to certain material risks and investors should not invest in securities of the Company unless they can afford to lose their entire investment.

### *Uncertainty of Revenues*

Since the date of incorporation, the Company has accumulated losses. While the Company has spent on headcount, R&D, marketing and infrastructure, it is starting see meaningful revenue growth. The Company is subject to all of the business risks and uncertainties associated with any small business enterprise, including the risk that it will not achieve its growth objectives. Thus, there can be no assurance that losses will not continue.

### *Reliance on Management and Dependence on Key Personnel*

The success of the Company is currently largely dependent upon on the performance of its directors and officers and the ability to attract and retain its key personnel. The loss of the services of these persons may have a material adverse effect on the Company's business and prospects. The Company will compete with numerous other companies for the recruitment and retention of qualified employees and contractors. There is no assurance that the Company can maintain the service of its directors and officers or other qualified personnel required to operate its business. Failure to do so could have a material adverse effect on the Company and its prospects.

### *Markets for Securities*

There can be no assurance that an active trading market in the Company's Common Shares will be sustained. The market price for the Company's Common Shares could be subject to wide fluctuations. Factors such as government regulation, interest rates, share price movements of the Company's peer companies and competitors, as well as overall market movements, may have a significant impact on the market price of the securities of Company. The stock market has from time to time experienced extreme price and volume fluctuations which have often been unrelated to the operating performance of particular companies.

The Company is unable to predict whether substantial amounts of its Common Shares will be sold in the open market. Any sales of substantial amounts of the Company's Common Shares in the public market,



or the perception that such sales might occur, could materially and adversely affect the market price of the Company's Shares.

### ***Litigation***

The Company and/or its directors may be subject to a variety of civil or other legal proceedings, with or without merit. At this time, there are no known outstanding, pending or contemplated legal proceedings against the Company which are material to the Company's business and affairs.

### ***Global Financial and Economic Conditions***

Global financial and economic conditions can be volatile. Some of the key impacts of the financial market turmoil include contraction in credit markets resulting in a widening of credit risk, devaluations and high volatility in global equity, commodity, foreign exchange markets and a lack of market liquidity. Such factors may impact the Company's ability to obtain financing in the future on favorable terms or obtain any financing at all. Additionally, global economic conditions may cause a long-term decrease in asset values and demand for the services and products of the Company. If such global volatility, market turmoil and a global recession occur, the Company's operations and financial condition could be adversely impacted.

### ***Insurance and Uninsured Risk***

The business of the Company will be subject to a number of risks and hazards generally, including adverse environmental conditions, industrial accidents, labor disputes, unusual or unexpected technological considerations, changes in the regulatory environment and political or social instability. Such occurrences or events could result in damage to the business of the Company.

It can be difficult or expensive to obtain the insurance needed by the Company for its business operations. As part of its business operations, the Company maintains insurance both as a corporate risk management strategy and to satisfy the requirements of many of its contracts. Insurance products are impacted by market fluctuations and can become expensive and sometimes difficult to obtain. There can be no assurance that the Company can secure all necessary or appropriate insurance at an affordable price for the required limits. Its failure to obtain such insurance could lead to uninsured losses that could have a material adverse effect on its results of operations or financial condition, or cause it to be out of compliance with its contractual obligations. The Company will periodically evaluate the cost and coverage of the insurance against certain risks to determine if it would be appropriate to obtain or continue to maintain such insurance. Without insurance, the Company may incur significant costs that could have a material adverse effect upon its financial performance and results of operations.

The Company may in the future be involved in product liability and product warranty claims relating to the products that it manufactures and distributes that, if adversely determined, could adversely affect the Company's financial condition, results of operations, and cash flows. Product liability claims can be expensive to defend and can divert the attention of management and other personnel for significant periods, regardless of the ultimate outcome. Claims of this nature could also have a negative impact on customer confidence in the Company's products.



### ***No Dividends***

The Company does not expect to pay dividends on the issued and outstanding Common Shares in the near-term or in the foreseeable future. If the Company generates any future earnings such cash resources will be retained and utilized to finance further growth and enhance current operations. The Board of Directors of the Company will determine if and when dividends should be declared and paid in the future based on the financial position of the Company and other factors relevant at that time. Until the Company pays dividends, which it may never do, a shareholder will not be able to receive a return on his or her investment in the Company's Common Shares unless such Common Shares are sold. In such event, a shareholder may only be able to sell his, her or its Common Shares at a price less than the price such shareholder originally paid for them, which could result in a loss of such shareholder's investment.

### ***Government Contracts***

The Company will depend, in part, on government contracts, which may only be partially funded, subject to termination, heavily regulated, and audited. The termination of one or more of these contracts could have a negative impact on the operations of the Company. The termination of funding for a government program would result in a loss of anticipated future revenues attributable to that program. That could have a negative impact on the operations of the Company. Also, no assurance can be given that the Company would be able to procure new contracts to offset the revenues lost as a result of any contract termination.

In addition, sales to the governments that the Company works with may be affected by:

- changes in procurement policies;
- changes in the structure and management of government departments;
- budget considerations;
- political developments domestically and abroad; and
- increased protectionism.

The influence of any of these factors, which are largely beyond the control of the Company, could also negatively impact the financial condition of the Company.

### ***Competitive Bidding***

The Company will derive significant revenue from contracts awarded through a competitive bidding process, which can impose substantial costs upon it, and the Company could fail to maintain its current and projected revenue if it fails to compete effectively. The Company expects that much of the business it will seek in the foreseeable future will be awarded through competitive bidding. Competitive bidding imposes substantial costs and presents a number of risks. Such risks include, but are not limited to:

- the need to bid on engagements in advance of the completion of their design, which may result in unforeseen difficulties in executing the engagement and cost overruns;



- the substantial cost and managerial time and effort that the Company spends to prepare bids and proposals for contracts that may not be awarded to it;
- the need to accurately estimate the resources and costs that will be required to service any contract the Company is awarded;
- the expense and delay that may arise if the Company's competitors protest or challenge contract awards made to it pursuant to competitive bidding, and the risk that any such protest or challenge could result in the resubmission of bids on modified specifications, or in termination, reduction, or modification of the awarded contract; and
- the opportunity cost of not bidding on and winning other contracts the Company might otherwise pursue.

To the extent the Company engages in competitive bidding and is unable to win particular contracts, it not only incurs substantial costs in the bidding process that could negatively affect the Company's operating results, but it may be precluded from operating in the market for services that are provided under those contracts for a number of years. Even if the Company wins a particular contract through competitive bidding, its profit margins may be depressed as a result of the costs incurred through the bidding process.

### ***Competition***

Competition within the market of the Company may reduce its ability to procure future contracts and sales. The industry in which the Company operates is competitive. Many of the competitors of the Company are large diversified corporations in the sensor and marine robotics industry. Some of the competitors of the Company may have more extensive or more specialized engineering, manufacturing, and marketing capabilities. There can be no assurance that the Company can continue to compete effectively with these companies.

### ***Development of New Technologies***

The future success of the Company will depend on its ability to develop new technologies that achieve market acceptance. The marine sensor and robotics market is characterized by rapidly-changing technologies and evolving industry standards. Accordingly, the future performance of the Company depends on a number of factors, including its ability to:

- identify emerging technological trends in its market;
- develop and maintain competitive products;
- enhance its products by adding innovative features that differentiate its products from those of its competitors; and
- manufacture and bring products to market quickly at cost-effective prices.

In order to remain competitive in the future, the Company will need to continue to develop new products, which will require the investment of significant financial resources in new product development. In addition, there can be no assurance that the market for the products of the Company will develop or



continue to expand as currently anticipated. The failure of the Company's technology to gain market acceptance could significantly reduce its revenues and harm its business. Furthermore, there is no assurance that the competitors of the Company will not develop competing technology, which gains market acceptance in advance of the products of the Company. The possibility that the competitors of the Company might develop new technology or products might cause the Company's existing technology and products to become obsolete. If the Company fails in its new product development efforts or its products fail to achieve market acceptance more rapidly than its competitors, the Company's revenues will decline and its business, financial condition, and results of operations will be negatively affected.

### ***Protection of Intellectual Property***

The Company may be unable to adequately protect its intellectual property rights, which could affect its ability to compete. Protecting the Company's intellectual property rights is critical to its ability to compete and succeed as a company. The Company currently has trademark registrations, which are necessary and contribute significantly to the preservation of its competitive position in the market. Further, the Company relies on a combination of copyright, trademark, and trade secret laws, confidentiality procedures, contractual provisions and other measures to protect its proprietary information. All of these measures afford only limited protection. There can be no assurance that any of these measures will not be challenged, invalidated or circumvented by third parties. In the future, the Company may not be able to obtain necessary licenses on commercially reasonable terms. The Company enters into confidentiality and invention assignment agreements with its employees so as to limit access to and disclosure of the Company's proprietary information. These measures may not suffice to deter misappropriation or independent third-party development of similar technologies.

### ***Outside Suppliers***

The Company's operations depend on component availability and the manufacture and delivery by key suppliers of certain products and services. Further, the Company's operations are dependent on the timely delivery of materials by outside suppliers. The Company cannot be sure that materials, components, and subsystems will be available in the quantities required, if at all. If any of the suppliers fail to meet the needs of the Company, it may not have readily available alternatives. The Company's inability to fill its supply needs would jeopardize its ability to satisfactorily complete its obligations under its contracts on a timely basis. This might result in reduced sales, contractually-imposed penalties for delay in delivery, termination of one or more of these contracts, or damage to the reputation of the Company and its relationships with its customers. All of these events could have a negative effect on the financial condition of the Company.

### ***Significant Sales of Shares***

Sales of a significant number of the Company's Common Shares by existing shareholders could cause the market price of its common stock to decline. If the Company's shareholders sell substantial amounts of the Company's Common Shares, including Shares issued upon the exercise of outstanding options and warrants, the market price of the Company's Common Shares may decline. These sales also might make it more difficult for the Company to sell equity or equity-related securities in the future at a time and price that the Company deems appropriate. The Company is unable to predict the effect that sales may have on the then prevailing market price of its Common Shares.



### ***Strategic Relationships, Investments and Acquisitions***

The Company may pursue strategic relationships, investments, and acquisitions and may not be able to successfully manage its operations if it fails to successfully integrate the acquired technologies and/or businesses. As part of the business strategy of the Company, it may expand its product offerings to include products that are complementary to its existing products. This strategy may involve technology licensing agreements, joint development agreements, investments, or acquisitions of other businesses that offer complementary products. The risks that may be encountered in acquiring or licensing technology from third parties include the following:

- difficulty in integrating the third-party product with the products of the Company;
- undiscovered software errors in the third-party product;
- difficulties in selling the third-party product;
- difficulties in providing satisfactory support for the third-party product;
- potential infringement claims from the use of the third-party product; and
- discontinuation of third-party product lines.

The risks commonly encountered in the investment in or acquisition of businesses would accompany any future investments or acquisitions by the Company. Such risks may include the following:

- issues related to product transition (such as development, distribution, and customer support);
- the substantial management time devoted to such activities;
- the potential disruption of the Company's ongoing business;
- undisclosed liabilities;
- failure to realize anticipated benefits (such as synergies and cost savings);
- the difficulty of integrating previously-distinct businesses into one business unit; and
- technological uncertainty regarding the current and future functionality of the product.

### ***Additional Capital***

The Company may require additional capital, in which case it may need to raise additional funds from equity markets or lenders in the future. If the expenditures of the Company exceed its incoming cash flows, the Company may be required to raise additional capital. In addition, the Company may choose to pursue additional financing in order to capitalize on potential opportunities in the marketplace that may accelerate its growth objectives. The Company's ability to arrange such financing in the future will depend in part on the prevailing capital market conditions, as well as on its business performance. There can be no assurance that the Company will be successful in its efforts to raise additional funds, if needed, on satisfactory terms. If additional capital is raised by the issuance of Common Shares, shareholders may experience dilution to their equity interest in the Company.



## ***Growth Management***

If the Company fails to manage its growth effectively, its business and operating results could be adversely affected. The Company expects to continue to grow its operations domestically and internationally, and to hire additional employees. Any growth in its operations and staff will place a significant strain on its management systems and resources. If the Company fails to manage its future anticipated growth, it may experience higher operating expenses and may be unable to meet the expectations of investors with respect to future operating results. To manage this growth the Company must, amongst other things, continue to:

- improve its financial and management controls, reporting systems, and procedures;
- add and integrate new senior management personnel;
- improve its licensing models and procedures;
- hire, train, and retain qualified employees;
- maintain sufficient working capital;
- control expenses;
- diversify sales strategies; and
- invest in its internal networking infrastructure and facilities.

To the extent that this anticipated growth does not occur or occurs more slowly than the Company anticipates, the Company may not be able to reduce expenses to the same degree. If the Company incurs operating expenses out of proportion to revenue in any given quarter, its operating results may be adversely impacted.

## ***Third Party Infringement Claims***

The Company may receive claims that it has infringed the intellectual property rights of others. As the number of products in the marine sensor and robotics industry increases and the functionality of these products further overlap, the Company may become increasingly subject to infringement claims, including patent, trademark, and copyright infringement claims. In addition, former employers of our former, current, or future employees may assert claims that such employees have improperly disclosed to the Company the confidential or proprietary information of these former employers. Any such claim, with or without merit, could be time-consuming to defend, result in costly litigation, divert management's attention from the Company's core business, require it to stop selling or delay shipping, or cause the redesign of its product or products. In addition, the Company may be required to pay monetary amounts, such as damages, for royalty or licensing arrangements, or to satisfy indemnification obligations that it has with some of its customers.

The Company licenses and uses software from third parties in its business. These third-party software licenses may not continue to be available to the Company on acceptable terms. Also, these third parties may from time to time receive claims that they have infringed the intellectual property rights of others, including patent and copyright infringement claims, which may affect the Company's ability to continue





licensing this software. The Company's inability to use any of this third-party software could result in shipment delays or other disruptions in its business, which could materially and adversely affect its operating results.

### ***Defects***

The Company's products may contain significant defects, which may result in liability and/or decreased sales. Despite efforts to test the products of the Company, significant errors or failures in such products may be experienced, or they might not work with other hardware or software as expected. This could delay the development or release of new products or new versions of products, or could adversely affect market acceptance of the Company's products. The Company's customers may claim that the Company is responsible for damages to the extent they are harmed by the failure of any of the Company's products. If the Company were to experience significant delays in the release of new products or new versions of products, or if customers were dissatisfied with product functionality or performance, the Company could lose revenue or be subject to liability for service or warranty costs. Should this occur, the business and operating results of the Company could be adversely affected.

### ***International Sales***

Sales to international customers expose the Company to political and currency related risks, as well as legal and regulatory changes in the jurisdictions in which its customers operate.

Every transaction with international customers is subject to certain domestic and foreign laws and regulations, including, but not limited to import-export controls, technology transfer restrictions, taxation, the Corruption of Foreign Public Officials Act (Canada) and other anti-corruption laws. While the Company has firm policies in place to comply with such laws and regulations, a failure to comply with these laws and regulations could result in administrative, civil, or criminal liabilities, which would have an adverse effect on the business and operating results of the Company.

The Company's international business is very sensitive to alterations in regulations, political environments, or security risks that may have an influence on its ability to perform business operations outside of Canada, including those regarding taxation, investments, and repatriation of earnings. The international business of the Company may also be impacted by changes in foreign national priorities and government budgets and may be further affected by global economic circumstances and conditions, and fluctuations in foreign exchange rates.

### ***Foreign Operations***

Our operations are exposed to various levels of political, economic and other risks and uncertainties. These risks and uncertainties include, but are not limited to government regulations (or changes to such regulations) with respect to restrictions on production, export controls, income taxes, expropriation of property, repatriation of profits, environmental legislation, land use, local ownership requirements and land claims of local people, regional and national instability. These factors are beyond the Company's control and the effect of these factors cannot be accurately predicted. Any changes in the above may adversely affect our business, future development and operations.





## ITEM 6: DIVIDENDS

No dividends have been paid during the Company's three most recently completed financial years. The Company does not have a formal dividend policy and it is not expected that one will be implemented during the current financial year. For the foreseeable future, should the Company generate any future earnings such cash resources will be retained and utilized to finance further growth and enhance current operations. The Board of Directors of the Company will determine if and when dividends should be declared and paid in the future based on the financial position of the Company and other factors relevant at that time.

## ITEM 7: DESCRIPTION OF CAPITAL STRUCTURE

### 7.1 Authorized and Issued Capital

The Company's authorized capital consists of an unlimited number of Common Shares, without par value, of which 120,073,599 Common Shares are issued and outstanding as of the date of this AIF.

The holders of Common Shares are entitled to one vote for each Common Share held and shall be entitled to dividends if, as and when declared by the Board of Directors. Holders of Common Shares are entitled, on liquidation, dissolution or winding up to receive such assets of the Company as are distributable to the holders of the Common Shares. There are no pre-emptive, redemption, retraction, purchase or conversion rights attaching to the Common Shares.

### *Options and Warrants*

As of October 4, 2018, the following stock options and share purchase warrants are outstanding:

Security	Number	Number Exercisable	Exercise Price	Expiry Date
Options	600,000	500,000	\$0.15	October 12, 2019
Options	300,000	200,000	\$0.15	December 1, 2019
Options	2,000,000	2,000,000	\$0.21	June 1, 2020
Options	350,000	233,333	\$0.17	September 8, 2020
Options	300,000	200,000	\$0.18	October 4, 2020
Options	1,770,000	590,000	\$0.18	December 15, 2020
Options	450,000	112,500	\$0.185	February 20, 2021
Options	200,000	66,660	\$0.21	June 21, 2021
Options	1,000,000	333,333	\$0.26	July 19, 2021
	6,970,000	4,235,826		

Security	Number	Exercise Price	Expiry Date
Warrants	4,894,998	\$0.30	April 11, 2019
Warrants	5,760,000	\$0.40	June 21, 2021
TOTAL	10,654,998		



## ITEM 8: MARKET FOR SECURITIES

### 8.1 Price Range and Trading Volume

The Common Shares of the Company currently trade on the TSX Venture Exchange in Canada under the symbol “**PNG**” and the OTCQB market in the United States under the symbol “**KRKNF**”. As of December 29, 2017, the closing price of the Company’s Common Shares was \$0.175 per share on the TSX Venture Exchange and U.S. \$0.1365 on the OTCQB.

The following table sets out the volume of trading and the closing price ranges of the Company’s Common Shares for the most recently completed financial year and the current year to date:

Month / Year	High (\$)	Low (\$)	Trading Volume
October 1 to 9, 2018	\$0.53	\$0.475	1,292,961
September 2018	0.54	0.36	4,229,140
August 2018	0.445	0.34	6,411,046
July 2018	0.39	0.26	8,554,836
June 2018	0.26	0.15	6,570,530
May 2018	0.17	0.15	2,933,250
April 2018	0.165	0.145	1,428,752
March 2018	0.195	0.155	3,182,948
February 2018	0.185	0.16	4,542,048
January 2018	0.18	0.165	4,352,409
December 2017	0.19	0.165	2,339,800
November 2017	0.18	0.155	2,836,710
October 2017	0.185	0.165	3,894,650
September 2017	0.20	0.16	3,897,684
August 2017	0.19	0.155	1,881,016
July 2017	0.185	0.165	1,928,987
June 2017	0.175	0.14	2,821,929
May 2017	0.185	0.145	2,747,990
April 2017	0.22	0.18	3,636,837
March 2017	0.215	0.15	14,475,746
February 2017	0.17	0.15	13,970,780
January 2017	0.155	0.125	4,625,219



## ITEM 9: PRIOR SALES

During the 12 months of the financial year ending December 31, 2017, the Company issued the following securities convertible into Common Shares at the following prices:

Date	Type of Security	Price per Security	Number of Securities
April 11, 2017	Warrants	\$0.30	5,903,330
December 18, 2017	Options	\$0.18	1,770,000

## ITEM 10: ESCROWED SECURITIES AND SECURITIES SUBJECT TO CONTRACTUAL RESTRICTION ON TRANSFER

As at the date of this AIF, no Common shares are held in escrow. Securities of the Company subject to contractual restrictions on transfer are 11,520,000 shares issued to OI. These shares were acquired in a private placement and have a 3-year lockup period which ends on June 28, 2021.

## ITEM 11: DIRECTORS AND EXECUTIVE OFFICERS

### 11.1 Name, Occupation and Security Holding

As of December 31, 2017, the name, municipality and country of residence, positions and offices held with the Company, principal occupation of each of the directors and executive officers, and security holdings of the Company is as follows:

Name, Province of Residence and Position with the Company	Principal Occupation During the Past Five Years	Date First Appointed	Number and Percentage of Common Shares held <sup>(1)</sup>
Karl Kenny <sup>(3)</sup> St. John's, NL Canada <i>President, CEO, and Director</i>	CEO of Kraken; CEO of Kraken Subco	February 18, 2015 <sup>(2)</sup>	26,260,049 21.9%
Greg Reid Toronto, ON Canada <i>CFO &amp; Corporate Secretary</i>	CFO of Kraken; President, GasGen Canada Ltd.	June 1, 2015	2,493,364 2.1%
Larry Puddister St. John's, NL Canada <i>Director</i>	Executive Chairman of Pennecon Ltd, CEO of Newcrete	October 13, 2016	1,500,000 1.2%
Moya Cahill <sup>(3)</sup> St. John's, NL Canada <i>Director</i>	CEO and co-founder of PanGeo Subsea	February 18, 2015 <sup>(2)</sup>	Nil 0%
Admiral Michael Connor Mystic, CT Canada <i>Director</i>	CEO of Thayer Mahan; US Navy Admiral	October 4, 2017	Nil 0%
Shaun McEwan <sup>(3)</sup> Ottawa, ON Canada <i>Director</i>	CFO, Quarterhill, Inc.	December 1, 2016	200,000 0.2%

Notes:



1. The approximate number and percentage of Common Shares of the Company beneficially owned, directly or indirectly, or over which control or direction is exercised by each director or executive officer as of the date of this AIF. This information is not within the knowledge of the management of the Company and has been furnished by the respective individuals, or has been extracted from the register of shareholdings maintained by the Company's transfer agent or from insider reports filed by the individuals and available through the Internet at [www.sedi.ca](http://www.sedi.ca).
2. Date of completion of the Qualifying Transaction
3. Member of the Audit Committee
4. Each Director and Officer of the Company will hold office until the next Annual General Meeting of Shareholders.

## **11.2 Shareholdings of Directors and Senior Officers**

As of the date of this AIF, the directors and executive officers of the Company, as a group, own beneficially, directly or indirectly, or exercise control or direction over 30,453,413 Common Shares or 25.4% of the issued and outstanding Common Shares of the Company on an undiluted basis.

## **11.3 Cease Trade Orders, Bankruptcies, Penalties or Sanctions**

Except as disclosed herein, to the knowledge of the Company, none of the directors or executive officers of the Company, and no shareholder of the Company holding sufficient number of securities of the Company to affect materially the control of the Company is, or has been within the ten years before the date of this AIF, a director or executive officer of any company (including the Company) that:

- (a) was subject to an order that was issued while the director or executive officer was acting in the capacity as director, chief executive officer or chief financial officer, or
- (b) was subject to an order that was issued after the director or executive officer ceased to be a director, chief executive officer or chief financial officer and which resulted from an event that occurred while that person was acting in the capacity as director, chief executive officer or chief financial officer, where "order" refers to a cease trade or similar order, or an order that denied the relevant company access to any exemption under securities legislation, that was in effect for a period of more than 30 consecutive days

Except as disclosed herein, to the knowledge of the Company, none of the directors or executive officers of the Company, or a shareholder holding a sufficient number of securities of the Company to affect materially the control of the Company:

- (a) is, as at the date of this AIF, or has been within the 10 years before the date of the AIF, a director or executive officer of any company (including the Company) that, while that person was acting in that capacity, became bankrupt, made a proposal under any legislation relating to bankruptcy or insolvency or was subject to or instituted any proceedings, arrangement or compromise with creditors or had a receiver, receiver manager or trustee appointed to hold the assets of that person, or
- (b) has, within the 10 years before the date of the AIF, became bankrupt, made a proposal under any legislation relating to bankruptcy or insolvency, or became subject to or instituted any proceedings, arrangement or compromise with creditors, or had a receiver, receiver manager or trustee appointed to hold the assets of the director, executive officer or shareholder.



To the knowledge of the Company, as at the date of this AIF, no director or executive officer of the Company or a shareholder holding a sufficient number of securities of the Company to materially affect the control of the Company has been subject to:

- (a) any penalties or sanctions imposed by a court relating to securities legislation or by a securities regulatory authority or has entered into a settlement agreement with a securities regulatory authority; or
- (b) any other penalties or sanctions imposed by a court or regulatory body that would likely be considered important to a reasonable investor in making an investment decision.

#### **11.4 Conflicts of Interest**

Some of the directors and officers of the Company or a subsidiary of the Company are or may be engaged in business activities on their own behalf and on behalf of other corporations and situations may arise where some of the directors may be in potential conflict of interest with the Company. Conflicts, if any, will be subject to the procedures and remedies under the CBCA or other applicable corporate legislation.

### **ITEM 12: LEGAL PROCEEDINGS AND REGULATORY ACTIONS**

#### **12.1 Legal Proceedings**

The Company is not aware of any material or contemplated legal proceedings to which it is or was a party to, or of which any of its property is or was the subject.

#### **12.2 Regulatory Actions**

The Company is not aware of:

- (a) any penalties or sanctions imposed against the Company by a court relating to securities legislation or by a securities regulatory authority during the financial year ended December 30, 2017;
- (b) any other penalties or sanctions imposed by a court or regulatory body against the Company that would likely be considered important to a reasonable investor in making an investment decision; or
- (c) any settlement agreements the Company has entered into with a court relating to securities legislation or with the securities regulatory authority during the financial year ended December 30, 2017.

### **ITEM 13: INTEREST OF MANAGEMENT AND OTHERS IN MATERIAL TRANSACTIONS**

Other than as set elsewhere in this AIF, none of the following persons has any material interest, direct or indirect, in any transaction within the three most recently completed financial years or during the current financial year that has materially affected or will materially affect the Company:

- (a) a director or executive officer of the Company;



- (b) a person or company that beneficially owns, or controls or directs, directly or indirectly, more than 10% of the outstanding common shares; and
- (c) any known associate or affiliate of any of the persons or companies referred to in (a) or (b).

#### **ITEM 14: TRANSFER AGENT AND REGISTRAR**

The Company's transfer agent for its Common Shares is Computershare Investor Services Inc. with an office at 510 Burrard Street, 2nd Floor Vancouver, British Columbia V6C 3B9.

#### **ITEM 15: MATERIAL CONTRACTS**

The Company currently does not have any material contracts

- (a) required to be filed under section 12.2 of the Instrument at the time this AIF is filed, as required under section 12.3 of the Instrument, or
- (b) that would be required to be filed under section 12.2 of the Instrument at the time this AIF is filed, as required under section 12.3 of the Instrument, but for the fact that it was previously filed.

#### **ITEM 16: INTEREST OF EXPERTS**

##### **16.1 Names of Experts**

The persons referred to below have been named as having prepared or certified a statement, report or valuation described or included in a filing, or referred to in a filing, made under the Instrument during, or relating to, the Company's financial year ended December 31, 2017 and for the subsequent period to date:

- KPMG LLP, Chartered Accountants, who have prepared an independent auditors' report dated May 2, 2018 in respect of the financial statements of Kraken for the years ended December 31, 2017 and 2016.

##### **16.2 Interests of Experts**

Based on information provided by the experts, none of the experts named under "Names of Experts", when or after they prepared the statement, report or valuation, has received any registered or beneficial interests, direct or indirect, in any securities or other property of the Company or of one of the Company's Associates or Affiliates (based on information provided to the Company by the experts) or is or is expected to be elected, appointed or employed as a director, officer or employee of the Company or of any Associate or Affiliate of the Company.

#### **ITEM 17: ADDITIONAL INFORMATION**

Additional information relating to Kraken may be found on the SEDAR at [www.sedar.com](http://www.sedar.com). Additional information, including particulars of directors' and officers' remuneration and indebtedness, principal holders of the Company's securities and securities authorized for issuance under equity compensation





plans, where applicable and financial information is contained in the Company's Management Proxy Circular dated May 22, 2018 and the Company's Filing Statement in respect of the Company's Qualifying Transaction dated February 5, 2015. Further financial information is provided in the Company's audited Financial Statements and MD&A for its most recently completed financial year ended December 31, 2017 and interim financial statements for the current

