
**UNITED STATES
SECURITIES AND EXCHANGE COMMISSION**
Washington, D.C. 20549

AMENDMENT NO.2
To
FORM S-1
REGISTRATION STATEMENT
UNDER
THE SECURITIES ACT OF 1933

APTOSE BIOSCIENCES INC.

(Exact Name of Registrant As Specified In Its Charter)

Canada
(State or other jurisdiction of
incorporation or organization)

2836
(Primary Standard Industrial
Classification Code Number)

98-1136802
(I.R.S. Employer
Identification Number)

**251 Consumers Road, Suite 1105
Toronto, Ontario, Canada M2J 4R3
(647) 479-9828**

(Address, including zip code, and telephone number, including area code, of registrant's principal executive offices)

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(Name, address, including zip code, and telephone number, including area code, of agent for service)

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From time to time after the effective date of this Registration Statement
(Approximate date of commencement of proposed sale to the public)

If any of the securities being registered on this Form are to be offered on a delayed or continuous basis pursuant to Rule 415 under the Securities Act of 1933, please check the following box.

If this Form is used to register additional securities for an offering pursuant to Rule 462(b) under the Securities Act, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering.

If this Form is a post-effective amendment filed pursuant to Rule 462(c) under the Securities Act, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering.

If this Form is a post-effective amendment filed pursuant to Rule 462(d) under the Securities Act, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering.

Indicate by check mark whether the Company is a large accelerated filer, an accelerated filer, anon-accelerated filer, or a smaller reporting company. See the definitions of "large accelerated filer," "accelerated filer" and "smaller reporting company" in Rule 12b-2 of the Exchange Act. (Check one):

Large accelerated filer

Accelerated filer

Non-accelerated filer

Smaller reporting company

Emerging growth company

If an emerging growth company, indicate by check mark if the Company has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 7(a)(2)(B) of the Securities Act.

The Company hereby amends this registration statement on such date or date(s) as may be necessary to delay its effective date until the Company shall file a further amendment which specifically states that this registration statement shall thereafter become effective in accordance with Section 8(a) of the Securities Act of 1933, or until the registration statement shall become effective on such date as the Commission acting pursuant to said Section 8(a) may determine.

The information in this prospectus is not complete and may be changed. These securities may not be sold until the registration statement filed with the Securities and Exchange Commission of which this prospectus is a part becomes effective. This prospectus is not an offer to sell these securities and it is not soliciting an offer to buy these securities in any state where the offer or sale is not permitted.

Subject to Completion, Dated December 29, 2023

PRELIMINARY PROSPECTUS



2,164,502 Common Shares

2,164,502 Pre-Funded Warrants to Purchase up to 2,164,502 Common Shares

2,164,502 Warrants to Purchase 2,164,502 Common Shares

Up to 2,164,502 Common Shares Underlying Pre-Funded Warrants

Up to 2,164,502 Common Shares Underlying Warrants

Up to 151,515 Common Shares Underlying Underwriter's Warrants

We are offering 2,164,502 common shares, no par value ("Offered Shares"), together with Pre-Funded Warrants and/or Warrants to purchase Offered Shares ("Warrants"). Offered Shares and Warrants will be sold in combination, with one Warrant exercisable for one Offered Share. Our common shares are listed on the Nasdaq Capital Market ("Nasdaq") under the symbol "APTO" and on the Toronto Stock Exchange ("TSX") under the symbol "APS". On December 26, 2023, the last reported sale price of the common shares on Nasdaq was \$2.31 per common share and on December 22, 2023, the TSX reported C\$3.04 per common share. The assumed combined public offering price for each Offered Share and accompanying Warrant is \$2.31, which is the last reported sale price of our common shares on Nasdaq on December 26, 2023. We have applied to the TSX for conditional approval of the offering and are relying on the exemption included in section 602.1 of the TSX Company Manual. The completion of the offering is conditional upon the approval of the TSX.

Each Warrant has an assumed exercise price of \$2.31 per Offered Share, which is the last reported sale price of our common shares on Nasdaq on December 26, 2023, will be exercisable immediately upon issuance, subject to certain limitations based on the holder's beneficial ownership of our common shares, and will expire five years from the date of issuance. The Offered Shares and Warrants are immediately separable and will be issued separately in this offering, but must be purchased together in this offering. We are also offering Pre-Funded Warrants to purchase up to 2,164,502 Offered Shares to those purchasers whose purchase of Offered Shares in this offering would result in the purchaser beneficially owning more than 4.99% (or, at the election of the purchaser, 9.99%) of our outstanding common shares following the consummation of this offering in lieu of the Offered Shares that would result in ownership in excess of 4.99% (or, at the election of the purchaser, 9.99%) following the consummation of this offering. Each Pre-Funded Warrant will be exercisable for one Offered Share at an exercise price of \$0.01 per Offered Share. Each Pre-Funded Warrant is being issued together with the same Warrants described above being issued with each Offered Share. The assumed combined public offering price for each such Pre-Funded Warrant, together with the Warrants, is \$2.30, which is equal to the assumed public offering price in this offering of an Offered Share and accompanying Warrant less the \$0.01 per Offered Share exercise price of each such Pre-Funded Warrant. Each Pre-Funded Warrant will be exercisable immediately upon issuance, subject to certain limitations based on the holder's beneficial ownership of our common shares, and may be exercised at any time until the Pre-Funded Warrant is exercised in full. The Pre-Funded Warrants and Warrants are immediately separable and will be issued separately in this offering, but must be purchased together in this offering. For each Pre-Funded Warrant and the accompanying Warrants we sell, the number of Offered Shares and the accompanying Warrants we are offering will be decreased on a one-for-one basis.

We are also registering the Offered Shares issuable upon exercise of the Pre-Funded Warrants and Warrants.

There is no established public trading market for the Pre-Funded Warrants and Warrants, and we do not expect a market to develop. We do not intend to apply for listing of the Pre-Funded Warrants or Warrants on any securities exchange or other nationally recognized trading system. Without an active trading market, the liquidity of the Pre-Funded Warrants and Warrants will be limited.

Investing in our Offered Shares, Pre-Funded Warrants and Warrants involves a high degree of risk. Review "[Risk Factors](#)" beginning on page 11 of this prospectus carefully before you make an investment in our securities. You should read this prospectus, together with additional information described under the headings "Incorporation of Certain Information by Reference" and "Where You Can Find More Information," carefully before investing in any of our Offered Shares, Pre-Funded Warrants and Warrants.

Neither the Securities and Exchange Commission nor any state securities commission has approved or disapproved of these securities or passed upon the adequacy or accuracy of this prospectus. Any representation to the contrary is a criminal offense.

	Per Offered Share and Warrant	Per Pre-Funded Warrant and Warrant	Total
Public offering price			
Underwriting discounts and commissions ⁽¹⁾			
Proceeds, before expenses, to us ⁽²⁾			

(1) See "Underwriting" beginning on page 16 for additional information regarding underwriting compensation.

(2) The amount of proceeds, before expenses, to us does not give effect to any exercise of the Pre-Funded Warrants or Warrants.

(3) The amount of offering proceeds to us presented in this table does not give effect to any exercise of the: (i) over-allotment option we have granted to the underwriter as described below and (ii) the underwriter's warrants being issued to the underwriter as described below.

We have granted the underwriter an option for a period of 30 days to purchase up to an additional 324,675 common shares and/or additional Warrants to purchase 324,675 common shares, in any combination, at a price of \$2.30 per additional common share and \$0.01 per additional Warrant.

The underwriter expects to deliver the Offered Shares, Pre-Funded Warrants and Warrants on or about _____, 2024.

Sole Book-Running Manager

Newbridge Securities Corporation

The date of this prospectus is _____, 2024

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ABOUT THIS PROSPECTUS

This prospectus, including the information incorporated by reference, is part of a registration statement that we have filed with the Securities and Exchange Commission (the “SEC”). You should not assume that the information contained in this prospectus is accurate on any date subsequent to the date set forth on the front cover of this prospectus or that any information we have incorporated by reference is correct on any date subsequent to the date of the document incorporated by reference, even though this prospectus is delivered or securities are sold or otherwise disposed of on a later date. It is important for you to read and consider all information contained in this prospectus, including the Information Incorporated by Reference herein, in making your investment decision. You should also read and consider the information in the documents to which we have referred you under the captions “Where You Can Find More Information” and “Incorporation of Certain Information by Reference” in this prospectus.

Neither we nor the underwriter have authorized any dealer, salesman or other person to give any information or to make any representation other than those contained or incorporated by reference in this prospectus. You must not rely upon any information or representation not contained or incorporated by reference in this prospectus. This prospectus does not constitute an offer to sell or the solicitation of an offer to buy any of our securities other than the securities covered hereby, nor does this prospectus constitute an offer to sell or the solicitation of an offer to buy any securities in any jurisdiction to any person to whom it is unlawful to make such offer or solicitation in such jurisdiction. Persons who come into possession of this prospectus in jurisdictions outside the United States are required to inform themselves about, and to observe, any restrictions as to the offering and the distribution of this prospectus applicable to those jurisdictions.

We further note that the representations, warranties and covenants made in any agreement that is filed as an exhibit to any document that is incorporated by reference in the accompanying prospectus were made solely for the benefit of the parties to such agreement, including, in some cases, for the purpose of allocating risk among the parties to such agreements, and should not be deemed to be a representation, warranty or covenant to you. Moreover, such representations, warranties or covenants were accurate only as of the date when made. Accordingly, such representations, warranties and covenants should not be relied on as accurately representing the current state of our affairs.

The information in this prospectus is accurate as of the date on the front cover. Information incorporated by reference into this prospectus is accurate as of the date of the document from which the information is incorporated. You should not assume that the information contained in this prospectus is accurate as of any other date.

As used in this prospectus and in any prospectus supplement, unless the context otherwise requires, the terms “Aptose,” the “Company,” “we,” “us,” and “our” refer to Aptose Biosciences Inc. and, unless the context requires otherwise, the subsidiaries through which it conducts business.

In order to maintain its listing on Nasdaq, the Company effected a reverse stock split on a fifteen (15) to one (1) share basis, and common shares commenced trading on a post-reverse stock split basis at market open on Tuesday, June 6, 2023. All share and per common share amounts in this prospectus have been adjusted retroactively to reflect the reverse stock split as if it had occurred at the beginning of the earliest period presented.

Unless stated otherwise or if the context otherwise requires, all references to dollar amounts in this prospectus are references to U.S. dollars.

CAUTIONARY STATEMENT REGARDING FORWARD-LOOKING STATEMENTS

This prospectus, including the documents incorporated by reference herein, contains forward-looking statements within the meaning of the United States Private Securities Litigation Reform Act of 1995 and “forward-looking information” within the meaning of applicable Canadian securities law. We refer to such forward-looking statements and forward-looking information collectively as “forward-looking statements”. These statements relate to future events or future performance and reflect our expectations and assumptions regarding our growth, results of operations, performance and business prospects and opportunities. Such forward-looking statements reflect our current beliefs and are based on information currently available to us. In some cases, forward-looking statements can be identified by terminology such as “may”, “would”, “could”, “will”, “should”, “expect”, “plan”, “intend”, “anticipate”, “believe”, “estimate”, “predict”, “potential”, “continue” or the negative of these terms or other similar expressions concerning matters that are not historical facts.

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The forward-looking statements contained in this prospectus and in the documents incorporated by reference reflect our current views with respect to future events, are subject to significant risks and uncertainties, and are based upon a number of estimates and assumptions that, while considered reasonable by us, are inherently subject to significant business, economic, competitive, political and social uncertainties and contingencies. Many factors could cause our actual results, performance or achievements to be materially different from any future results, performance, or achievements that may be expressed or implied by such forward-looking statements, including, among others:

- our ability to continue as a going concern;
- our lack of product revenues;
- our early stage of development, particularly the inherent risks and uncertainties associated with (i) developing new drug candidates generally, (ii) demonstrating the safety and efficacy of these drug candidates in clinical studies in humans, and (iii) obtaining regulatory approval to commercialize these drug candidates;
- our need to raise substantial additional capital in the future and that we may be unable to raise such funds when needed and on acceptable terms;
- further equity financing, which may substantially dilute the interests of our existing shareholders;
- clinical studies and regulatory approvals of our drug candidates are subject to delays, and may not be completed or granted on expected timetables, if at all, and such delays may increase our costs and could substantially harm our business;
- our reliance on external contract research/manufacturing organizations for certain activities and if we are subject to quality, cost, or delivery issues with the preclinical and clinical grade materials supplied by contract manufacturers, our business operations could suffer significant harm;
- clinical studies are long, expensive and uncertain processes and the United States Food and Drug Administration, or “FDA”, or other similar foreign regulatory agencies that we are required to report to, may ultimately not approve any of our product candidates;
- our ability to comply with applicable regulations and standards;
- our inability to achieve our projected development goals in the time frames we announce and expect;
- difficulties in enrolling patients for clinical trials may lead to delays or cancellations of our clinical trials;
- our reliance on third parties to conduct and monitor our preclinical studies;
- our ability to attract and retain key personnel, including key executives and scientists;
- any misconduct or improper activities by our employees;
- our exposure to exchange rate risk;
- our ability to commercialize our business attributed to negative results from clinical trials;
- the marketplace may not accept our products or product candidates due to the intense competition and technological change in the biotechnical and pharmaceuticals, and we may not be able to compete successfully against other companies in our industries and achieve profitability;
- our ability to obtain and maintain patent protection;
- our ability to afford substantial costs incurred with defending our intellectual property;
- our ability to protect our intellectual property rights and not infringe on the intellectual property rights of others;
- our business is subject to potential product liability and other claims;
- potential exposure to legal actions and potential need to take action against other entities;
- commercialization limitations imposed by intellectual property rights owned or controlled by third parties;
- our ability to maintain adequate insurance at acceptable costs;
- our ability to find and enter into agreements with potential partners;
- extensive government regulation;
- data security incidents and privacy breaches could result in increased costs and reputational harm;
- our common share price has been and is likely to continue to be volatile;
- future sales of our common shares by us or by our existing shareholders could cause our common share price to drop;

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- changing global market and financial conditions;
- changes in an active trading market in our common shares;
- difficulties by non-Canadian investors to obtain and enforce judgments against us because of our Canadian incorporation and presence;
- potential adverse U.S. federal tax consequences for U.S. shareholders because we are a “passive foreign investment company”;
- our “smaller reporting company” status;
- any failures to maintain an effective system of internal controls may result in material misstatements of our financial statements, or cause us to fail to meet our reporting obligations or fail to prevent fraud;
- our broad discretion in how we use the proceeds of the sale of Offered Shares, Pre-Funded Warrants and Warrants;
- our ability to expand our business through the acquisition of companies or businesses; and
- other risks detailed from time-to-time in our on-going filings with the SEC and Canadian securities regulators, and those which are discussed under the heading “Risk Factors” in this prospectus and in the documents incorporated by reference.

Should one or more of these risks or uncertainties materialize, or should the assumptions described in the sections entitled “Risk Factors” in this prospectus and in the documents incorporated by reference underlying those forward-looking statements prove incorrect, actual results may vary materially from those described in the forward-looking statements.

More detailed information about these and other factors is included in this prospectus under the section entitled “Risk Factors” and in the documents incorporated by reference into this prospectus. Although we have attempted to identify factors that could cause actual actions, events or results to differ materially from those described in forward-looking statements, there may be other factors that cause actions, events or results not to be as anticipated, estimated or intended. Forward-looking statements are based upon our beliefs, estimates and opinions at the time they are made and we undertake no obligation to update forward-looking statements if these beliefs, estimates and opinions or circumstances should change, except as required by applicable law. There can be no assurance that forward-looking statements will prove to be accurate, as actual results and future events could differ materially from those anticipated in such statements. Accordingly, readers should not place undue reliance on forward-looking statements.

Forward-looking statements contained in this prospectus are made as of the date of this prospectus. Forward-looking statements made in a document incorporated by reference into this prospectus are made as of the date of the original document and have not been updated by us except as expressly provided for in this prospectus.

Except as required under applicable securities legislation, we undertake no obligation to publicly update or revise forward-looking statements, whether as a result of new information, future events or otherwise. **We qualify all the forward-looking statements contained in this prospectus and the documents incorporated by reference in this prospectus by the foregoing cautionary statements.**

ENFORCEABILITY OF CIVIL LIABILITIES

We are incorporated under the laws of Canada. Many of our directors and officers and the experts named in this prospectus are residents of countries other than the United States, and all or a substantial portion of their assets and some of our assets are located outside the United States. We have appointed Aptose Biosciences U.S. Inc. as our agent for service of process in the United States, but it may be difficult for holders of securities who reside in the United States to effect service within the United States upon those directors, officers and experts who are not residents of the United States. Additionally, it may not be possible for you to enforce judgments obtained in U.S. courts based upon the civil liability provisions of the U.S. federal securities laws or other laws of the United States. In addition, there is doubt as to whether an original action could be brought in Canada against us or our directors or officers based solely upon U.S. federal or state securities laws and as to the enforceability in Canadian courts of judgments of U.S. courts obtained in actions based upon the civil liability provisions of U.S. federal or state securities laws.

PROSPECTUS SUMMARY

This summary highlights information contained elsewhere in this prospectus or incorporated by reference. It may not contain all of the information that you should consider before investing in our securities. You should read this entire prospectus carefully, including the “Risk Factors”, “Management’s Discussion and Analysis of Financial Condition and Results of Operations” sections, and the financial statements and related notes included or incorporated by reference herein. This prospectus includes forward-looking statements that involve risks and uncertainties. See “Cautionary Statement Regarding Forward-Looking Statements.”

Aptose Biosciences Inc.

Company Overview

We are a science-driven biotechnology company advancing targeted agents to treat life-threatening cancers, such as acute myeloid leukemia (“AML”), high-risk myelodysplastic syndromes (“MDS”), and other hematologic malignancies. Based on insights into the genetic and epigenetic profiles of certain cancers and patient populations, We are building a pipeline of novel oncology therapies directed at dysregulated processes and signaling pathways. We are developing targeted medicines for precision treatment of these diseases to optimize efficacy and quality of life by minimizing the side effects associated with conventional therapies. We currently have in development two molecules: tuspetinib (HM43239) and luxepetinib (CG-806), both being evaluated for safety, tolerability, pharmacokinetics, and signals of efficacy in Phase 1 clinical trials. Each molecule is described below.

Tuspetinib is a once daily oral potent myeloid kinase inhibitor, targeting a constellation of kinases operative in myeloid malignancies and known to be involved in tumor proliferation, resistance to therapy, and differentiation but avoiding kinases that typically cause toxicities associated with other kinase inhibitors. Tuspetinib has completed the dose escalation and dose exploration stages of an international Phase 1/2 clinical trial designed to assess the safety, tolerability, pharmacokinetics, pharmacodynamic responses, and efficacy of tuspetinib as a single agent in patients with relapsed or refractory AML (“R/R AML”). Complete remissions (“CRs”) without dose limiting toxicities (“DLT”) were achieved at four dose levels across a broad diversity of mutationally-defined AML populations and with a favorable safety profile. Moreover, tuspetinib to date has caused no QTc prolongations or differentiation syndrome in treated patients and has caused no myelosuppression with continuous dosing of patients in remission. These findings led to advancement of tuspetinib into the APTIVATE expansion trial of the Phase 1/2 program to collect responses in R/R AML patient populations enriched with specific genotypic and phenotypic backgrounds when treated with single agent tuspetinib or when combined with the venetoclax BCL-2 inhibitor, with the intent to guide selection of mutationally-defined AML populations for single agent Phase 2 Accelerated Approval Trial(s) and to position tuspetinib for dual and triple combination studies in later and early lines of therapy. Based on the safety and efficacy profile of tuspetinib, we believe that tuspetinib, if approved, can reach greater than \$3 billion in annual sales by 2035 because we believe tuspetinib could (1) become the preferred kinase inhibitor for inclusion in triplet combination for front line AML patients with FLT3 mutations and for patients with wild type FLT3, (2) become the preferred kinase inhibitor for inclusion in doublet combination with venetoclax for second line R/R AML patients, (3) serve as an effective agent for maintenance therapy to prevent relapse in patients who achieved a CR through a stem cell transplant or through drug-based therapy, and 4) serve as an effective agent for the treatment of third line FLT3 mutated patients failed by prior therapy with other FLT3 inhibitors. In addition, we plan to test tuspetinib for efficacy and safety in patients with MDS, and, if found active and safe in this population, could support the overall market potential of tuspetinib at \$3 billion sales annually. However, our belief is based on management’s current assumptions and estimates, which are subject to change, and there can be no assurance that tuspetinib will ever be approved or successfully commercialized and, if approved and commercialized, that it will ever generate significant revenues. See our “Risk Factors – *“We are an early stage development company with no revenues from product sales.” and “We have a history of operating losses. We expect to incur net losses and we may never achieve or maintain profitability.”*” in our Annual Report on Form 10-K for the year ended December 31, 2022.

Luxepetinib is a novel, oral, highly potent lymphoid and myeloid kinase inhibitor that selectively targets defined clusters of kinases operative in myeloid and lymphoid hematologic malignancies. This small molecule anticancer agent has been evaluated in a Phase 1a/b study for the treatment of patients having B-cell leukemias and lymphomas that are resistant/refractory/intolerant to other therapies. Under a separate Investigational New Drug, luxepetinib has been evaluated in a Phase 1a/b study for the treatment of patients with R/R AML or high risk MDS.

These studies with the original formulation demonstrated tumor shrinkage among B-cell cancer patients, including a very recent report of a CR in a diffuse large B-cell lymphoma patient that was determined via biopsy analysis at the end of Cycle 22 with 900mg two times a day (“BID”) dosing of the original G1 formulation. Likewise, a CR in one R/R AML patient occurred with 450mg BID dosing of the original G1 formulation. While these CRs were important, poor absorption of the original G1 formulation hampered the effectiveness of luxetpinib. To address the limited absorption of the G1 formulation, a new G3 formulation was developed and demonstrated improved absorption properties. The new G3 formulation is now being tested under conditions of twice daily continuous oral dosing in R/R AML patients. It is hoped the G3 formulation of luxetpinib can serve patients across lymphoid and myeloid malignancies and combine well with other agents to extend its application to multiple lines of therapy.

Corporate Information

We were incorporated under the *Business Corporations Act* (Ontario) on September 5, 1986 under the name RML Medical Laboratories Inc. On October 28, 1991, we amalgamated with Mint Gold Resources Ltd., which caused us to become a reporting issuer in Ontario. On August 25, 1992, we changed our name to IMUTEK Corporation. On November 27, 1996, we changed our name to Imutec Pharma Inc., and on November 19, 1998, we changed our name to Lorus Therapeutics Inc. On October 1, 2005, we continued under the *Canada Business Corporations Act* and on July 10, 2007 we completed a plan of arrangement and corporate reorganization with, among others, 6650309 Canada Inc., 6707157 Canada Inc. and Pinnacle International Lands, Inc. On May 25, 2010, we consolidated our outstanding common shares on the basis of one post-consolidation common share for each 30 pre-consolidation common shares.

On August 28, 2014 we changed our name from Lorus Therapeutics Inc. to Aptose Biosciences Inc. and on October 1, 2014 we consolidated our outstanding common shares on the basis of one (1) post-consolidation common share for each twelve (12) pre-consolidation common shares. On May 24, 2023, we consolidated our outstanding common shares on the basis of one (1) post-consolidation common share for each fifteen (15) pre-consolidation common shares.

We have two subsidiaries: Aptose Biosciences U.S. Inc., a corporation incorporated under the laws of Delaware; and NuChem Pharmaceuticals Inc., a corporation incorporated under the laws of Ontario, Canada. We own 100% of the issued and outstanding voting share capital of Aptose Biosciences U.S. Inc., and 80% of the issued and outstanding voting share capital of NuChem Pharmaceuticals Inc.

Our head, registered and records office is located at 251 Consumers Road, Suite 1105, Toronto, Ontario, Canada, M2J 4R3. Our executive office is located at 12770 High Bluff Drive, Suite 120, San Diego, CA 92130. We maintain a website at www.aptose.com. Information contained on our website is not part of this prospectus.

Recent Developments

Clinical Update

We previously announced an up-to-date review of clinical data for Aptose’s two investigational products for hematologic malignancies: tuspetinib and luxetpinib.

Tuspetinib (HM43239)

As of December 26, we have dosed a total of 160 R/R AML patients.

- Completed tuspetinib dose escalation and dose exploration Phase 1/2 trial in 91 R/R AML patients. The TUS/VEN combination has dosed 69 patients:
 - Tuspetinib demonstrated a favorable safety profile.
 - As a single agent at therapeutic doses of 80-160 mg in 68 evaluable patients, TUS was more active in VEN-naïve patients, with an overall CRc rate of 29% (8/28).
 - This included a 42% CRc rate (5/12) in FLT3-mutated patients
 - And a 19% CRc rate (3/16) in FLT3-unmutated, or wildtype, AML patients
 - Responses and blood counts improved with continuous dosing.
 - Many bridged to an allogeneic stem cell transplant (HSCT).
 - Durability was observed when HSCT was not performed.
 - 80 mg was selected as the recommended phase 2 dose.
 - Tuspetinib showed a favorable safety profile with only mild adverse events (AEs) and no dose-limiting toxicities (DLTs) up to 160 mg per day, and no drug discontinuations from drug related toxicity.
 - TUS single agent showed responses and blood counts improved with continuous dosing.
 - Patients enrolled at higher dose levels above 80mg represented a different population – primarily VEN failures – more difficult-to-treat and with lower response rates to therapies. Response rates above the 80mg dose level were lower due the different patient population.
 - Tuspetinib showed a favorable safety profile with only mild adverse events (AEs) and no dose-limiting toxicities (DLTs) up to 160 mg per day, and no drug discontinuations from drug related toxicity.

- Completed successful End of Phase 1 Meeting with the United States Food and Drug Administration for tuspetinib, and a monotherapy RP2D was selected as 80mg daily, and all development paths remain open, including the single arm accelerated path.
- Initiated tuspetinib APTIVATE expansion trial with R/R AML patients:
 - TUS directly targets many of the pathways involved in venetoclax (VEN) resistance, and TUS may re-sensitize prior-VEN failure patients to VEN.
 - TUS is being administered as a combination doublet with TUS/VEN, and enrollment has been brisk.
 - Data for patients treated with the TUS/VEN doublet are available from a data cut effective 23 October 2023 with conclusions below drawn from this data cut.
 - TUS/VEN doublet study, 49 patients were dosed with 80 mg of tuspetinib and 200 mg of venetoclax, with 36 evaluable (and 13 patients too early to assess).
 - Data reflects a short median follow-up time of 1.6 months.
 - Patients were heavily exposed to Prior-VEN and Prior-FLT3 inhibitor treatment.
 - TUS/VEN was active in both VEN-naïve and prior Prior-VEN relapsed/refractory patients.
 - TUS demonstrated composite complete remission (CRc) rates:
 - Among all evaluable patients, TUS/VEN demonstrated a CRc rate of 25% (9/36); 43% (3/7) in VEN-naïve patients, and 21% (6/29) in Prior-VEN patients.
 - Among FLT3 wildtype patients, TUS/VEN demonstrated an overall CRc rate of 20% (5/25); 33% (2/6) in VEN-naïve patients, and 16% (3/19) in Prior-VEN patients.
 - Among FLT3 mutant patients, TUS/VEN demonstrated an overall CRc rate of 36% (4/11); a complete response in a VEN-naïve patient (1/1); a 30% (3/10) in Prior-VEN patients; and 44% (4/9) in patients treated prior with a FLT3 inhibitor.
- Key findings:
 - TUS/VEN is a well tolerated combination therapy.
 - TUS/VEN is active across broad populations of R/R AML.
 - TUS/VEN is active in FLT3 wildtype, representing ~70% of AML patients.
 - TUS/VEN retains activity in the difficult-to-treat Prior-VEN AML population.
 - TUS/VEN doublet has the potential to be the first-to-market in R/R prior-VEN failure setting
 - We are seeking a collaboration partner to study TUS as part of a TUS/VEN/HMA triplet in 1L newly diagnosed AML patients unfit for chemotherapy with or without FLT3 mutations

Luxepitinib (CG-806)

- 50mg G3 formulation with continuous dosing achieves roughly equivalent pharmacokinetic profile as 900mg original G1 formulation; and
- Continuous dosing of a new G3 formulation has commenced in R/R AML patients and PK data are being collected to determine if the new formulation delivers improved plasma exposures

Intellectual Property

We believe that our issued patents and pending applications are important in establishing and maintaining a competitive position with respect to our products and technology.

Tuspetinib (HM43239)

In November 2021, we licensed the exclusive rights to research, develop and commercialize HM43229. Under the terms of the agreement, Hanmi Pharmaceutical Co., Ltd. (“Hanmi”) has granted us exclusive worldwide rights to HM43239 for all indications. We are now the exclusive licensee of composition of matter and use patents covering HM43229, and HM43239 analogs. We believe that we now own rights to a strong and defensive intellectual property position.

As of December 26, 2023, we own rights in 43 issued patents, including 4 issued U.S. patents, and 23 patents validated in countries in Europe, that are in force and cover the HM43239 compound, or analog compounds. These patents are expected to provide protection until 2038 through 2039. Patent applications are also pending in the United States and in contracting states to the Patent Cooperation Treaty for coverage of HM43239 and analog compounds, with expected expiry dates between 2038 and 2042.

Luxepitinib (CG-806)

In May 2018 and June 2018, we licensed from Crystal Genomics, Inc. (“CG”) an exclusive license to research, develop and commercialize luxepitinib in all countries of the world except the Republic of Korea and China, for all fields of use (collectively, the “Rights”) to luxepitinib, by exercising an option we obtained through a June 2016 option-license agreement with CG that had granted us an exclusive option to research, develop and commercialize luxepitinib. In June 2018, we entered into a separate license agreement with CG for us to gain a license for rights to luxepitinib in China (including the People’s Republic of China, Hong Kong, and Macau) (the “China Rights”). We now own worldwide Rights to luxepitinib, including an issued patent in China but excluding any Rights in Korea.

Notwithstanding the foregoing, we expect to revise our current development as follows. Assuming the net proceeds from this offering and our existing cash, cash equivalents and short-term investments, an expected second tranche of \$4 million from Hanmi pursuant to a subscription agreement, a committed equity facility, and ATM we plan to, (i) complete our ongoing APTIVATE clinical trial studying TUS and TUS/VEN, (ii) pause enrollment in the LUX G3 study and (iii) evaluate other costs reductions in general and administrative expenses. If we do not raise the net

proceeds in this offering we may conduct additional reductions in general and administrative expenses as well as seek additional financing.

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As of December 26, 2023, we owned rights to 49 issued patents, including 3 issued U.S. patents, and 30 patents validated in countries in Europe, that are in force and cover numerous compounds, including the CG-806 compound, pharmaceutical compositions comprising the CG-806 compound, and methods of use for treating various diseases by administering various compounds, including the CG-806 compound. These patents are expected to provide protection until 2033-2038. Patent applications are also pending in the United States and in contracting states to the Patent Cooperation Treaty for coverage of CG-806, with expected expiry dates between 2038-2039.

THE OFFERING

Securities offered by us	2,164,502 Offered Shares Warrants to purchase 2,164,502 Offered Shares Pre-Funded Warrants to purchase up to 2,164,502 Offered Shares
Description of securities	Each Warrant has an assumed exercise price of \$2.31 per Offered Share, which is the last reported sale price of our common shares on Nasdaq on December 26, 2023, will be exercisable immediately upon issuance, subject to certain limitations based on the holder’s beneficial ownership of our common shares, and will expire five years from the date of issuance. The Offered Shares and Warrants are immediately separable and will be issued separately in this offering, but must be purchased together in this offering. We are also offering Pre-Funded Warrants to purchase up to 2,164,502 Offered Shares to those purchasers whose purchase of Offered Shares in this offering would result in the purchaser beneficially owning more than 4.99% (or, at the election of the purchaser, 9.99%) of our outstanding common shares following the consummation of this offering in lieu of the Offered Shares that would result in ownership in excess of 4.99% (or, at the election of the purchaser, 9.99%) following the consummation of this offering. Each Pre-Funded Warrant will be exercisable for one Offered Share at an exercise price of \$0.01 per Offered Share. Each Pre-Funded Warrant is being issued together with the same Warrants described above being issued with each Offered Share. The assumed combined public offering price for each such Pre-Funded Warrant, together with the Warrants, is \$2.31, which is equal to the assumed public offering price in this offering of an Offered Share and accompanying Warrant less the \$0.01 per Offered Share exercise price of each such Pre-Funded Warrant. Each Pre-Funded Warrant will be exercisable immediately upon issuance, subject to certain limitations based on the holder’s beneficial ownership of our common shares, and may be exercised at any time until the Pre-Funded Warrant is exercised in full. The Pre-Funded Warrants and Warrants are immediately separable and will be issued separately in this offering, but must be purchased together in this offering. For each Pre-Funded Warrant and the accompanying Warrants we sell, the number of Offered Shares and the accompanying Warrants we are offering will be decreased on a one-for-one basis. See “Description of Our Securities We Are Offering”.
Common shares outstanding prior to this offering	7,942,363 common shares
Common shares outstanding immediately after this offering	10,106,865 common shares (assuming none of the Warrants or Pre-Funded Warrants issued in this offering are exercised) or 10,431,540 common shares, if the over-allotment option granted to the underwriter is exercised in full (assuming none of the Warrants or Pre-Funded Warrants issued in this Offering are exercised).
Option to purchase additional shares	We have granted to the underwriter the option, exercisable for 30 days from the date of this prospectus, to purchase up to 324,675 additional Offered Shares and/or Warrants to purchase 324,675 additional Offered Shares. Each Offered Share purchased pursuant to this option will be at a price of \$2.30 per share, and each Warrant purchased pursuant to this option will be at a price of \$0.01 per share.
Underwriter’s Warrants	The registration statement of which this prospectus is a part also registers the offer and sale of warrants exercisable for an aggregate of 151,515 common shares (174,242 common shares in the event that the underwriter exercises its over-allotment option in full) and the shares issuable upon exercise thereof that we will issue to the underwriter as a portion of the underwriting compensation payable to the underwriter in connection with this offering. The warrants will be exercisable for a four year period commencing six months after the effective date of the registration statement of which this prospectus is a part at an exercise price equal to 125% of the public offering price of the common shares. Please see “Underwriting — Underwriter’s Warrants” for a description of these warrants.
Stock symbol	Our common shares are listed on Nasdaq under the symbol “APTO” and on the TSX under the symbol “APS”.

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Use of proceeds	<p>We estimate the net proceeds from this offering will be approximately \$4.3 million (or approximately \$5.0 million if the underwriter exercises in full its over-allotment option) million (assuming none of the Pre-Funded Warrants or Warrants issued in this offering are exercised), after deducting estimated underwriting discounts and commissions and estimated offering expenses payable by us.</p> <p>We intend to use any proceeds from this offering that we receive for working capital and general corporate purposes. See “Use of Proceeds” on page 13 for more information.</p>
Risk factors	<p>Investing in our securities involves a high degree of risk. As an investor you should be prepared to lose your entire investment. See “Risk Factors” beginning on page 11.</p>
Transfer agent	<p>Computershare Investor Service</p>

¹ The number of common shares to be outstanding prior to and after this offering is based on 7,942,363 common shares outstanding as of December 26, 2023 and excludes:

- 151,515 common shares issuable upon the exercise by the underwriter of the underwriter’s warrants;
- 1,183,947 stock options outstanding as of December 26, 2023, at a weighted average exercise price of \$44.80 per common share; and
- 378,832 common shares that have been reserved for issuance in connection with future grants under our security-based compensation plans.

Unless otherwise indicated, all information contained in this prospectus assumes: (i) no exercise of the outstanding options or warrants described above; and (ii) no sale of Pre-Funded Warrants in this offering and no exercise of the Warrants or the underwriter’s warrants in this offering.

RISK FACTORS

You should carefully consider the following risk factors in addition to other information in this prospectus before purchasing our Offered Shares. The risks and uncertainties described below are those that we currently deem to be material and that we believe are specific to our company, our industry and this offering. These risks and uncertainties are not the only ones facing us. Additional risks of which we are not presently aware or that we currently believe are immaterial may also harm our business and results of operations. The trading price of our common shares could decline due to the occurrence of any of these risks, and investors could lose all or part of their investment.

In evaluating the Company, its business and any investment in the Company, readers should carefully consider the following factors, together with the additional risk factors incorporated by reference from Item 1A of the Company's Annual Report on Form 10-K as filed with the SEC on March 24, 2023 (see "Incorporation of Certain Information by Reference").

Risks Related to this Offering

A substantial number of common shares may be sold in the market following this offering, which may depress the market price for our Offered Shares, Pre-Funded Warrants and Warrants.

Sales of a substantial number of our common shares in the public market following this offering could cause the market price of our common shares to decline. A substantial majority of the outstanding common shares are, and the Offered Shares offered hereby or issuable upon exercise of the Pre-Funded Warrants and Warrants offered hereby will be, freely tradable without restriction or further registration under the Securities Act. Because the Pre-Funded Warrants and Warrants are exercisable into our Offered Shares, volatility or a reduction in the market price of our common shares could have an adverse effect on the market price of the Pre-Funded Warrants and Warrants.

There is no public market for the Pre-Funded Warrants and Warrants being offered in this offering.

There is no established public trading market for the Pre-Funded Warrants and Warrants being offered in this offering, and we do not expect a market to develop. In addition, we do not intend to apply to list the Pre-Funded Warrants and Warrants on any national securities exchange or other nationally recognized trading system, including Nasdaq or the TSX. Without an active market, the liquidity of the Pre-Funded Warrants and Warrants will be extremely limited.

Holders of our Pre-Funded Warrants and Warrants will have no rights as a holder of our common shares until they acquire our common shares.

Until you acquire our common shares upon exercise of the Pre-Funded Warrants or Warrants, you will have no rights with respect to our common shares issuable upon exercise of the Pre-Funded Warrants or Warrants. Upon exercise of your Pre-Funded Warrants or Warrants, you will be entitled to exercise the rights of a holder of our common shares only as to matters for which the record date occurs after the exercise date.

The Pre-Funded Warrants and Warrants offered by this prospectus may not have any value.

The Warrants offered by this prospectus will be exercisable for five years from the date of issuance, and the Pre-Funded Warrants will be exercisable at any time until exercised in full. There can be no assurance that the market price of our common shares will ever exceed the exercise prices of the Pre-Funded Warrants or Warrants. In the event that the price of our common shares does not exceed the exercise price of the Pre-Funded Warrants and/or the Warrants during their terms, such Pre-Funded Warrants or Warrants may not have any value.

Investors in this offering may experience immediate dilution in the book value per share of the Offered Shares purchased in the offering.

The Offered Shares sold in this offering, if any, will be sold from time to time at various prices. However, the expected offering price of the Offered Shares may be substantially higher than the net tangible book value per share of our currently outstanding common shares. After giving effect to the sale of our Offered Shares in the aggregate amount of \$5 million which assumes that the over-allotment option is not exercised at an assumed offering price of \$2.31 per share, the last reported sale price of our common shares on December 26, 2023 on Nasdaq, and after deducting estimated commissions and estimated offering expenses, our as-adjusted net tangible book value as of September 30, 2023 would have been approximately \$11.04 million, or approximately \$1.09 per common share. While this represents an immediate increase in net tangible book value, future sales of Offered Shares in this offering may represent an immediate increase in net tangible book value to our existing shareholders and an immediate dilution to new investors, depending on the market value of our common shares.

You may experience future dilution as a result of future equity offerings.

In order to raise additional capital, we may in the future offer additional common shares or other securities convertible into or exchangeable for common shares at prices that may not be the same as the price per share in this offering. We may sell common shares or other securities convertible into or exchangeable for our shares of common shares in any other offering at a price per share that is less than the price per share paid by investors in this offering, and investors purchasing shares of common shares or other securities convertible into or exchangeable for our common shares in the future could have rights superior to existing shareholders. The price per share at which we sell additional shares of common shares or other securities convertible or exchangeable into our common shares, in future transactions may be higher or lower than the price per share paid by investors in this offering.

Our management might apply the net proceeds from this offering in ways with which you do not agree and in ways that may impair the value of your investment.

We currently intend to use the net proceeds from this offering for working capital and general corporate purposes. Our management has broad discretion as to the use of these proceeds and you will be relying on the judgment of our management regarding the application of these proceeds. We might apply these proceeds in ways with which you do not agree, or in ways that do not yield a favorable return. If our management applies these proceeds in a manner that does not yield a significant return, if any, on our investment of these net proceeds, it could compromise our ability to pursue our growth strategy and adversely affect the market price of our common shares.

We expect to be a “passive foreign investment company”, which may have adverse U.S. federal income tax consequences for U.S. investors.

We believe we were a “passive foreign investment company” (a “PFIC”) within the meaning of Section 1297 of the U.S. Internal Revenue Code of 1986, as amended (the “Code”) for our most recently completed taxable year and based on the nature of our business, the projected composition of our gross income and the projected composition and estimated fair market values of our assets, we expect to be a PFIC for our current taxable year and may be a PFIC in subsequent tax years. If we are a PFIC for any year during a U.S. taxpayer’s holding period of Common Shares, Pre-Funded Warrants, Warrants, or Warrant Shares (as defined below under the heading “*Certain Material U.S. Federal Income Tax Considerations*”), then such U.S. taxpayer generally will be required to treat any gain realized upon a disposition of the Common Shares, Pre-Funded Warrants, Warrants, or Warrant Shares or any so-called “excess distribution” received on its Common Shares, Pre-Funded Warrants or Warrant Shares as ordinary income, and to pay an interest charge on a portion of such gain or distribution. In certain circumstances, the sum of the tax and the interest charge may exceed the total amount of proceeds realized on the disposition, or the amount of excess distribution received, by the U.S. taxpayer. Subject to certain limitations, these tax consequences may be mitigated if a U.S. taxpayer makes a timely and effective QEF Election (as defined below) with respect to the Common Shares, Pre-Funded Warrants and Warrant Shares or a Mark-to-Market Election (as defined below) with respect to the Common Shares and Warrant Shares. A U.S. taxpayer generally may not make a QEF Election with respect to the Warrants or a Mark-to-Market Election with respect to the Pre-Funded Warrants or Warrants. In addition, U.S. taxpayers should be aware that there can be no assurances that we will satisfy the record keeping requirements that apply to a QEF (as defined below), or that we will supply U.S. taxpayers with information that such U.S. taxpayers are required to report under the QEF rules, in the event that we are a PFIC. Thus, U.S. Holders may not be able to make a QEF Election with respect to their Common Shares, Pre-Funded Warrants and Warrant Shares. A U.S. taxpayer who makes a Mark-to-Market Election generally must include as ordinary income each year the excess of the fair

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market value of the Common Shares or Warrant Shares over the taxpayer's basis therein. Each potential investor who is a U.S. taxpayer should review the discussion below under the heading "*Certain Material U.S. Federal Income Tax Considerations — Passive Foreign Investment Company Rule*" in its entirety and should consult its own tax advisor regarding the tax consequences of the PFIC rules and the acquisition, ownership, and disposition of the Common Shares, Pre-Funded Warrants, Warrants, and the Warrant Shares.

Proposed legislation in the U.S. Congress, including changes in U.S. tax law, and the Inflation Reduction Act of 2022 may adversely impact us and the value of the Common Shares, Pre-Funded Warrants, Warrants and Warrant Shares.

Changes to U.S. tax laws (which changes may have retroactive application) could adversely affect us or holders of the Common Shares, Pre-Funded Warrants, Warrants and Warrant Shares. In recent years, many changes to U.S. federal income tax laws have been proposed and made, and additional changes to U.S. federal income tax laws are likely to continue to occur in the future.

The U.S. Congress is currently considering numerous items of legislation which may be enacted prospectively or with retroactive effect, which legislation could adversely impact our financial performance and the value of the Common Shares, Pre-Funded Warrants, Warrants and Warrant Shares. Additionally, states in which we operate or own assets may impose new or increased taxes. If enacted, most of the proposals would be effective for the current or later years. The proposed legislation remains subject to change, and its impact on us and purchasers of the Common Shares, Pre-Funded Warrants, Warrants and Warrant Shares is uncertain.

In addition, the Inflation Reduction Act of 2022 includes provisions that impact the U.S. federal income taxation of corporations. Among other items, this legislation includes provisions that impose a minimum tax on the book income of certain large corporations and an excise tax on certain corporate stock repurchases that are imposed on the corporation repurchasing such stock. It is unclear how this legislation will be implemented by the U.S. Department of the Treasury and we cannot predict how this legislation or any future changes in tax laws might affect us or purchasers of the Common Shares, Pre-Funded Warrants, Warrants and Warrant Shares.

USE OF PROCEEDS

We estimate that the net proceeds from this offering will be approximately \$4.3 million (or approximately \$5.0 million if the underwriter exercises in full its over-allotment option), assuming a public offering price of \$2.31 per Offered Share and accompanying Warrant, which was the last reported sale price per common share on Nasdaq on December 26, 2023, after deducting estimated underwriting discounts and commissions and estimated offering expenses payable by us and assuming no sale of Pre-Funded Warrants in this offering and no exercise of the Warrants being issued in this offering.

We intend to use any proceeds from this offering for working capital and general corporate purposes. We cannot specify with certainty all of the particular uses for the net proceeds that we will have from this offering. Therefore, our management will have broad discretion to determine the specific use for the net proceeds and we may use the proceeds for purposes that are not contemplated at the time of this offering.

We will incur all costs associated with this prospectus and the registration statement of which it is a part.

Based on our planned use of the net proceeds from this offering and our existing cash, cash equivalents and short-term investments, an expected second tranche of \$4 million from Hanmi pursuant to a subscription agreement, a committed equity facility, and ATM, we estimate that such funds will be sufficient to enable us to fund our operating expenses and capital expenditure requirements for at least the next 10 months from the date of this prospectus. We have based this estimate on assumptions that may prove to be incorrect, and we could use our available capital resources sooner than we currently expect. In any event, we will require additional funding to complete the clinical development of, and commercialize, our product candidates. We may satisfy our future cash needs through the sale of equity securities, debt financings, working capital lines of credit, corporate collaborations or license agreements, grant funding, interest income earned on invested cash balances or a combination of one or more of these sources.

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This expected use of the net proceeds from this offering represents our intentions based upon our current plans and business conditions, which could change in the future as our plans and business conditions evolve. We may also use a portion of the net proceeds to fund our clinical plans. As of the date of this prospectus, we cannot predict with certainty all of the particular uses for the net proceeds received by us in this offering. Predicting the cost necessary to develop product candidates can be difficult and we anticipate that we will need additional funds to complete the development of our existing product candidates and to develop any future product candidates. The amounts and timing of our actual expenditures and the extent of clinical development may vary significantly depending on numerous factors, including the progress of our development efforts, the status of and results from preclinical studies and any ongoing clinical trials or clinical trials we may commence in the future, as well as any collaborations that we may enter into with third parties for our product candidates and any unforeseen cash needs. This may result in us having to curb our development plans and staffing levels. As a result, our management will retain broad discretion over the allocation of the net proceeds from this offering. Notwithstanding the foregoing, we expect to revise our current development as follows. Assuming the net proceeds from this offering and our existing cash, cash equivalents and short-term investments, an expected second tranche of \$4 million from Hanmi pursuant to a subscription agreement, a committed equity facility, and ATM we plan to, (i) complete our ongoing APTIVATE clinical trial studying TUS and TUS/VEN, (ii) pause enrollment in the LUX G3 study and (iii) evaluate other costs reductions in general and administrative expenses. If we do not raise the net proceeds in this offering we may conduct additional reductions in general and administrative expenses as well as seek additional financing.

DILUTION

If you invest in our securities, your ownership interest will be diluted to the extent of the difference between the public offering price per Offered Share and the as adjusted net tangible book value per common share immediately after the closing of this offering.

Our historical net tangible book value as of September 30, 2023 was \$6.7 million, or \$0.89 per common share. Our historical net tangible book value is the amount of our total tangible assets less our liabilities. Historical net tangible book value per common share is our historical net tangible book value divided by the number of common shares outstanding as of September 30, 2023.

After giving effect to the sale of Offered Shares and the Warrants in this offering at an assumed combined public offering price of \$2.31 per Offered Share and Warrant, which was the last reported sale price of our common shares on Nasdaq on December 26, 2023, and after deducting estimated underwriting discounts and commissions and estimated offering expenses payable by us, assuming no sale of Pre-Funded Warrants in this offering and excluding the proceeds, if any, from the exercise of the Warrants issued in this offering, our as adjusted net tangible book value as of September 30, 2023 would be \$11.04 million, or \$1.09 per common share. This amount represents an immediate increase in as adjusted net tangible book value of \$0.20 per common share to our existing stockholders and an immediate dilution of \$1.22 per common share to investors participating in this offering. We determine dilution per Offered Share to investors participating in this offering by subtracting as adjusted net tangible book value per common share after this offering from the assumed public offering price per Offered Share paid by investors participating in this offering.

The following table illustrates this dilution on a per Offered Share basis to new investors:

Assumed combined public offering price per Offered Share and Warrant	\$2.31
Historical net tangible book value per common share as of September 30, 2023	\$ 0.89
Increase in as adjusted net tangible book value per common share attributable to this offering	\$ 0.20
As adjusted net tangible book value per common share after giving effect to this offering	<u>\$1.09</u>
Dilution per Offered Share to new investors in this offering	<u>\$1.22</u>

Each \$0.10 increase or decrease in the assumed public offering price of \$2.31 per Offered Share and Warrant, which was the last reported sale price of our common share on Nasdaq on December 26, 2023, would increase or decrease the as-adjusted net tangible book value per common share by \$0.01 per common share and the dilution per Offered Share to investors participating in this offering by \$0.09 per Offered Share, assuming that the number of Offered Shares and Warrants offered by us, as set forth on the cover page of this prospectus, remains the same and after deducting estimated underwriting discounts and commissions and estimated offering expenses payable by us, and excluding the proceeds, if any, from the exercise of the Warrants issued in this offering.

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We may also increase or decrease the number of Offered Shares we are offering. A 1.0 million share increase in the number of Offered Shares and Warrants offered by us, as set forth on the cover page of this prospectus, would increase the as adjusted net tangible book value per common share by approximately \$0.10 and decrease the dilution per Offered Share to new investors participating in this offering by approximately \$0.10, based on an assumed combined public offering price of \$2.31 per Offered Share and Warrant, which was the last reported sale price of our common shares on Nasdaq on December 26, 2023, remaining the same and after deducting estimated underwriting discounts and commissions and estimated offering expenses payable by us, and excluding the proceeds, if any, from the exercise of the Warrants issued in this offering. A 1.0 million share decrease in the number of Offered Shares and Warrants offered by us, as set forth on the cover page of this prospectus, would decrease the as adjusted net tangible book value per Offered Share after this offering by approximately \$0.11 and increase the dilution per Offered Share to new investors participating in this offering by approximately \$0.11, based on an assumed combined public offering price of \$2.31 per Offered Share and Warrant, which was the last reported sale price of our common shares on Nasdaq on December 26, 2023, remaining the same and after deducting estimated underwriting discounts and commissions and estimated offering expenses payable by us, and excluding the proceeds, if any, from the exercise of the Warrants issued in this offering.

If the underwriter exercises its option to purchase additional Offered Shares and the Warrants in full, the adjusted tangible book value after this offering would be \$1.13 per share, the increase in net tangible book value would be \$0.24 per common share and the dilution to new investors would be \$1.18 per common share.

The information discussed above is illustrative only and will adjust based on the actual public offering price, the actual number of Offered Shares and Warrants that we offer in this offering, and other terms of this offering determined at pricing. The discussion and table above assume (i) no sale of Pre-Funded Warrants, which, if sold, would reduce the number of Offered Shares that we are offering on a one-for-one basis and (ii) no exercise of Warrants or underwriter's warrants sold in this offering.

UNDERWRITING

We entered into an underwriting agreement with the underwriter named below on _____, 2024.

The underwriting agreement provides for the purchase of a specific number of Offered Shares and Warrants to purchase Offered Shares, or Pre-Funded Warrants and Warrants to purchase Offered Shares, as applicable. Subject to the terms and conditions of the underwriting agreement, each underwriter has severally agreed to purchase the number of Offered Shares, Pre-Funded Warrants and Warrants set forth opposite its name below:

Underwriters	Number of Offered Shares	Number of Pre-Funded Warrants	Number of Warrants
Newbridge Securities Corporation	_____	_____	_____
Total	=====	=====	=====

The underwriter has agreed to purchase all of the Offered Shares, or Pre-Funded Warrants and Warrants, as applicable offered by this prospectus, if any are purchased.

The Offered Shares or Pre-Funded Warrants, as applicable, and accompanying Warrants offered hereby are expected to be ready for delivery on or about _____, 2023 against payment in immediately available funds. The Offered Shares or Pre-Funded Warrants, and the accompanying Warrants are immediately separable and will be issued separately in this offering, but must be purchased together in this offering.

The underwriter is offering the Offered Shares, Pre-Funded Warrants and Warrants subject to various conditions and may reject all or part of any order. The underwriter has advised us that it proposes to offer the Offered Shares, Pre-Funded Warrants and Warrants to the public at the public offering price set forth on the cover page of this prospectus and to dealers at a price less a concession not in excess of \$ _____ per Offered Share and accompanying Warrant, or per Pre-Funded Warrant and accompanying Warrant, as applicable. After the Offered Shares, Pre-Funded Warrants and Warrants are released for sale to the public, the representative may change the offering price, the concession, and other selling terms at various times.

The following table provides information regarding the amount of the discounts and commissions to be paid to the underwriter by us, before expenses:

	Total Per Offered Share and Warrant	Total Per Pre-Funded Warrant and Warrant	Total Without Option(2)	Total With Option(2)
Public offering price	\$ _____	\$ _____		
Underwriting discounts and commissions(1)	\$ _____	\$ _____		
Proceeds, before expenses, to us	\$ _____	\$ _____		

(1) We have agreed to pay the underwriter a commission of 7.0% of the gross proceeds of this offering.

(2) Over-allotment option is not exercisable for Pre-Funded Warrants.

We estimate that our total expenses of the offering, excluding the estimated underwriting discounts and commissions, will be approximately \$350,000. We have agreed to reimburse the underwriter for certain of their expenses in an amount up to \$125,000.

We have agreed to indemnify the underwriter against certain liabilities, including liabilities under the Securities Act.

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Rules of the SEC may limit the ability of the underwriter to bid for or purchase Offered Shares before the distribution of the Offered Shares pursuant to the offering is completed. However, the underwriter may engage in the following activities in accordance with the rules:

- Stabilizing transactions – The representative may make bids or purchases for the purpose of pegging, fixing or maintaining the price of the Offered Shares, so long as stabilizing bids do not exceed a specified maximum.
- Penalty bids – If the representative purchases Offered Shares in the open market in a stabilizing transaction or syndicate covering transaction, it may reclaim a selling concession from the underwriter and selling group members who sold those Offered Shares as part of the offering.
- Passive market making – Market makers in the Offered Shares who are underwriter or prospective underwriters may make bids for or purchases of Offered Shares, subject to limitations, until the time, if ever, at which a stabilizing bid is made.

Similar to other purchase transactions, the underwriter's purchases to cover the syndicate short sales or to stabilize the market price of the Offered Shares may have the effect of raising or maintaining the market price of the Offered Shares or preventing or mitigating a decline in the market price of the Offered Shares. As a result, the price of the Offered Shares may be higher than the price that might otherwise exist in the open market. The imposition of a penalty bid might also have an effect on the price of the Offered Shares if it discourages resales of the Offered Shares.

Neither we nor the underwriter make any representation or prediction as to the effect that the transactions described above may have on the price of the Offered Shares. These transactions may occur on Nasdaq or otherwise. If such transactions are commenced, they may be discontinued without notice at any time.

Advisory Agreement

On December 8, 2023, we entered into an advisory agreement with Newbridge Securities Corporation whereby Newbridge Securities Corporation agreed to provide certain investment advisory services in connection with this offering for an amount equal to \$50,000. On December 23, 2023, we and Newbridge Securities Corporation terminated the advisory agreement with no fees paid or owed.

Over-Allotment Option

In addition to the discount set forth in the above table, we have granted the underwriter a 30-day option to purchase from us up to an additional 324,675 common shares and/or additional Warrants to purchase 324,675 common shares at a price of \$2.30 per share or \$0.01 per Warrant, less the underwriting discount and commissions. If the underwriter exercises this option in full, the total underwriting discounts and commissions payable will be \$402,500 and the total proceeds to us, before expenses, will be \$4,997,500. The underwriter may exercise the option solely to cover over-allotments, if any, made in connection with this offering.

Underwriter's Warrants

Upon the closing of this offering, we have agreed to issue to Newbridge Securities Corporation, or its designees, warrants (the "underwriter's warrants") to purchase a number of common shares equal to an aggregate of 7% of the total securities sold in this public offering. The underwriter's warrants will be exercisable at a per share exercise price equal to 125% of the public offering price per security sold in this offering. The underwriter's warrants are exercisable at any time and from time to time, in whole or in part, during the four year period commencing six months after the effective date of the registration statement related to this offering.

We are registering hereby the issuance of the underwriter's warrants and the common shares issuable upon exercise of such warrants. The underwriter's warrants and the common shares underlying the underwriter's warrants have been deemed compensation by the Financial Industry Regulatory Authority, or FINRA, and are therefore subject to a 180-day lock-up pursuant to Rule 5110(g)(1) of FINRA. Neither Newbridge Securities Corporation or its permitted assignees under such rule, may sell, transfer, assign, pledge, or hypothecate the underwriter's warrants or the securities underlying the underwriter's warrants, nor will Newbridge Securities Corporation engage in any hedging, short sale, derivative, put, or call transaction that would result in the effective economic disposition of the underwriter's warrants or the underlying shares for a period of 180 days from the effective date of the registration statement.

Additionally, the underwriter's warrants may not be sold, transferred, assigned, pledged or hypothecated for a 180-day period following the effective date of the registration statement except to any underwriter and selected dealer participating in this offering and their bona fide officers or partners. The underwriter's warrants will provide for adjustment in the number and price of the underwriter's warrants and the common shares underlying such underwriter's warrants in the event of recapitalization, merger, stock split or other structural transaction, or a future financing undertaken by us.

Lock-Ups

Our officers, directors and holders of more than 5.0% of our outstanding common shares have agreed that, for a period of 90 days from the date of this prospectus, they will not, subject to certain exceptions, offer, pledge, sell, contract to sell, sell any option, right or warrant to purchase, lend or otherwise transfer or dispose, directly or indirectly, any common shares or any securities convertible into or exercisable or exchangeable for shares of capital stock without the prior written consent of the underwriter. Additionally, we have also agreed that, for a period of 90 days from the date of this prospectus, we will not, subject to certain exceptions (including sales of common shares in certain instances where the sales price equals or exceeds the public offering price), offer, pledge, sell, contract to sell, sell any option, right or warrant to purchase, lend or otherwise transfer or dispose, directly or indirectly, any shares of our capital stock or any securities convertible into or exercisable or exchangeable for shares of capital stock without the prior written consent of the underwriter. The underwriter, in its sole discretion, may release any of the securities subject to these lock-up agreements at any time without notice.

Electronic Delivery of Preliminary Prospectus

A prospectus in electronic format may be delivered to potential investors by one or more of the underwriters participating in the offering. The prospectus in electronic format will be identical to the paper version of such prospectus. Other than the prospectus in electronic format, the information on any underwriter's website and any information contained in any other website maintained by an underwriter is not part of this prospectus or the registration statement of which this prospectus forms a part.

Notice to Non-U.S. Investors

Belgium

The offering is exclusively conducted under applicable private placement exemptions and therefore it has not been and will not be notified to, and this document or any other offering material relating to the Offered Shares, Pre-Funded Warrants and Warrants has not been and will not be

approved by, the Belgian Banking, Finance and Insurance Commission (“Commission bancaire, financière et des assurances/Commissie voor het Bank, Financie en Assurantiewezen”). Any representation to the contrary is unlawful.

Each underwriter has undertaken not to offer sell, resell, transfer or deliver directly or indirectly, any Offered Shares, Pre-Funded Warrants and Warrants, or to take any steps relating/ancillary thereto, and not to distribute or publish this document or any other material relating to the Offered Shares, Pre-Funded Warrants and Warrants or to the offering in a manner which would be construed as: (a) a public offering under the Belgian Royal Decree of 7 July 1999 on the public character of financial transactions; or (b) an offering of securities to the public under Directive 2003/71/EC which triggers an obligation to publish a prospectus in Belgium. Any action contrary to these restrictions will cause the recipient and the company to be in violation of the Belgian securities laws.

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Canada

Any distribution of securities in Canada will be made only on a private placement basis exempt from the requirement that we prepare and file a prospectus with the securities regulatory authorities in any province where distributions of the securities are made. Any offering in Canada will be done by way of a separate Canadian offering memorandum that will be attached to and incorporate this prospectus supplement.

France

Neither this prospectus nor any other offering material relating to the Offered Shares, Pre-Funded Warrants and Warrants has been submitted to the clearance procedures of the Autorité des marchés financiers in France. The Offered Shares, Pre-Funded Warrants and Warrants have not been offered or sold and will not be offered or sold, directly or indirectly, to the public in France. Neither this prospectus nor any other offering material relating to the Offered Shares, Pre-Funded Warrants and Warrants has been or will be: (a) released, issued, distributed or caused to be released, issued or distributed to the public in France; or (b) used in connection with any offer for subscription or sale of the Offered Shares, Pre-Funded Warrants and Warrants to the public in France. Such offers, sales and distributions will be made in France only: (i) to qualified investors (*investisseurs qualifiés*) and/or to a restricted circle of investors (*cercle restreint d'investisseurs*), in each case investing for their own account, all as defined in and in accordance with Articles L.411-2, D.411-1, D.411-2, D.734-1, D.744-1, D.754-1 and D.764-1 of the French Code monétaire et financier; (ii) to investment services providers authorised to engage in portfolio management on behalf of third parties; or (iii) in a transaction that, in accordance with article L.411-2-II-1^o-or-2^o-or-3^o of the French Code monétaire et financier and article 211-2 of the General Regulations (*Règlement Général*) of the *Autorité des marchés financiers*, does not constitute a public offer (appel public à l'épargne). Such Offered Shares, Pre-Funded Warrants and Warrants may be resold only in compliance with Articles L.411-1, L.411-2, L.412-1 and L.621-8 through L.621-8-3 of the French Code *monétaire et financier*.

Israel

This prospectus does not constitute a prospectus under the Israeli Securities Law, 5728-1968, or the Securities Law, and has not been filed with or approved by the Israel Securities Authority. In the State of Israel, this document is being distributed only to, and is directed only at, and any offer of the Offered Shares, Pre-Funded Warrants and Warrants is directed only at, investors listed in the first addendum to the Israeli Securities Law, or the Addendum, consisting primarily of joint investment in trust funds, provident funds, insurance companies, banks, portfolio managers, investment advisors, members of the Tel Aviv Stock Exchange, underwriters, venture capital funds, entities with equity in excess of NIS 50 million and "qualified individuals", each as defined in the Addendum (as it may be amended from time to time), collectively referred to as qualified investors (in each case purchasing for their own account or, where permitted under the Addendum, for the accounts of their clients who are investors listed in the Addendum). Qualified investors will be required to submit written confirmation that they fall within the scope of the Addendum, are aware of the meaning of same and agree to it.

Italy

The offering of the Offered Shares, Pre-Funded Warrants and Warrants offered hereby in Italy has not been registered with the *Commissione Nazionale per la Società e la Borsa*, or CONSOB, pursuant to Italian securities legislation and, accordingly, the Offered Shares, Pre-Funded Warrants and Warrants offered hereby cannot be offered, sold or delivered in the Republic of Italy, or Italy, nor may any copy of this prospectus or any other document relating to the Offered Shares, Pre-Funded Warrants and Warrants offered hereby be distributed in Italy other than to professional investors (*operatori qualificati*) as defined in Article 31, second paragraph, of CONSOB Regulation No. 11522 of 1 July, 1998 as subsequently amended. Any offer, sale or delivery of the Offered Shares, Pre-Funded Warrants and Warrants offered hereby or distribution of copies of this prospectus or any other document relating to the Offered Shares, Pre-Funded Warrants and Warrants offered hereby in Italy must be made:

- (a) by an investment firm, bank or intermediary permitted to conduct such activities in Italy in accordance with Legislative Decree No. 58 of 24 February 1998 and Legislative Decree No. 385 of 1 September 1993, or the Banking Act;

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- (b) in compliance with Article 129 of the Banking Act and the implementing guidelines of the Bank of Italy; and
- (c) in compliance with any other applicable laws and regulations and other possible requirements or limitations which may be imposed by Italian authorities.

Sweden

This prospectus has not been nor will it be registered with or approved by Finansinspektionen (the Swedish Financial Supervisory Authority). Accordingly, this prospectus may not be made available, nor may the Offered Shares, Pre-Funded Warrants and Warrants offered hereunder be marketed and offered for sale in Sweden, other than under circumstances which are deemed not to require a prospectus under the Financial Instruments Trading Act (1991: 980).

Switzerland

The Offered Shares, Pre-Funded Warrants and Warrants offered pursuant to this prospectus will not be offered, directly or indirectly, to the public in Switzerland and this prospectus does not constitute a public offering prospectus as that term is understood pursuant to art. 652a or art. 1156 of the Swiss Federal Code of Obligations. The company has not applied for a listing of the Offered Shares, Pre-Funded Warrants and Warrants being offered pursuant to this prospectus on the SWX Swiss Exchange or on any other regulated securities market, and consequently, the information presented in this prospectus does not necessarily comply with the information standards set out in the relevant listing rules. The Offered Shares, Pre-Funded Warrants and Warrants being offered pursuant to this prospectus have not been registered with the Swiss Federal Banking Commission as foreign investment funds, and the investor protection afforded to acquirers of investment fund certificates does not extend to acquirers of Offered Shares, Pre-Funded Warrants and Warrants.

Investors are advised to contact their legal, financial or tax advisers to obtain an independent assessment of the financial and tax consequences of an investment in Offered Shares, Pre-Funded Warrants and Warrants.

European Economic Area and the United Kingdom

In relation to each Member State of the European Economic Area and the United Kingdom, each referred to as a Relevant State, no Offered Shares, Pre-Funded Warrants or Warrants have been offered or will be offered pursuant to the offering to the public in that Relevant State prior to the publication of a prospectus in relation to the Offered Shares, Pre-Funded Warrants and Warrants which has been approved by the competent authority in that Relevant State or, where appropriate, approved in another Relevant State and notified to the competent authority in that Relevant State, all in accordance with the Prospectus Regulation), except that offers of Offered Shares, Pre-Funded Warrants and Warrants may be made to the public in that Relevant State at any time under the following exemptions under the Prospectus Regulation:

- (a) to any legal entity which is a qualified investor as defined under the Prospectus Regulation;
- (b) to fewer than 150 natural or legal persons (other than qualified investors as defined under the Prospectus Regulation), subject to obtaining the prior consent of the underwriter for any such offer; or
- (c) in any other circumstances falling within Article 1(4) of the Prospectus Regulation,

provided that no such offer of Offered Shares, Pre-Funded Warrants or Warrants shall require us or any of underwriters to publish a prospectus pursuant to Article 3 of the Prospectus Regulation or supplement a prospectus pursuant to Article 23 of the Prospectus Regulation.

Each person in a Relevant State who initially acquires any Offered Shares, Pre-Funded Warrants or Warrants or to whom any offer is made will be deemed to have represented, acknowledged and agreed to and with us and the underwriter that it is a qualified investor within the meaning of the Prospectus Regulation.

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In the case of any Offered Shares, Pre-Funded Warrants or Warrants being offered to a financial intermediary as that term is used in Article 5(1) of the Prospectus Regulation, each such financial intermediary will be deemed to have represented, acknowledged and agreed that the Offered Shares, Pre-Funded Warrants or Warrants acquired by it in the offer have not been acquired on a non-discretionary basis on behalf of, nor have they been acquired with a view to their offer or resale to, persons in circumstances which may give rise to an offer to the public other than their offer or resale in a Relevant State to qualified investors, in circumstances in which the prior consent of the underwriter has been obtained to each such proposed offer or resale.

We, the underwriter and their affiliates will rely upon the truth and accuracy of the foregoing representations, acknowledgements and agreements.

For the purposes of this provision, the expression an “offer to the public” in relation to any Offered Shares, Pre-Funded Warrants or Warrants in any Relevant State means the communication in any form and by any means of sufficient information on the terms of the offer and any Offered Shares, Pre-Funded Warrants or Warrants to be offered so as to enable an investor to decide to purchase or subscribe for any Offered Shares, Pre-Funded Warrants or Warrants, and the expression “Prospectus Regulation” means Regulation (EU) 2017/1129.

References to the Prospectus Regulation includes, in relation to the United Kingdom, the Prospectus Regulation as it forms part of UK domestic law by virtue of the European Union (Withdrawal) Act 2018.

The above selling restriction is in addition to any other selling restrictions set out below.

United Kingdom

This document is for distribution only to persons who (i) have professional experience in matters relating to investments and who qualify as investment professionals within the meaning of Article 19(5) of the Financial Services and Markets Act 2000 (Financial Promotion) Order 2005 (as amended, the Financial Promotion Order), (ii) are persons falling within Article 49(2)(a) to (d), or high net worth companies, unincorporated associations etc., of the Financial Promotion Order, (iii) are outside the United Kingdom, or (iv) are persons to whom an invitation or inducement to engage in investment activity (within the meaning of Section 21 of the Financial Services and Markets Act 2000, as amended, or FSMA,) in connection with the issue or sale of any securities may otherwise lawfully be communicated or caused to be communicated (all such persons together being referred to as “relevant persons”). This document is directed only at relevant persons and must not be acted on or relied on by persons who are not relevant persons. Any investment or investment activity to which this document relates is available only to relevant persons and will be engaged in only with relevant persons.

CERTAIN MATERIAL U.S. FEDERAL INCOME TAX CONSIDERATIONS

The following is a general summary of certain material U.S. federal income tax considerations applicable to a U.S. Holder (as defined below) arising from and relating to the acquisition, ownership and disposition of Offered Shares and Warrants (one Offered Share and one Warrant acquired together pursuant to this offering is referred to in this summary as a “Offered Share Unit”) or Pre-Funded Warrants and Warrants (one Pre-Funded Warrant and one Warrant acquired together pursuant to this offering is referred to in this summary as a “Pre-Funded Warrant Unit”), the acquisition, ownership, and disposition of Offered Shares acquired as part of the Offered Share Units, the acquisition, ownership and disposition of Pre-Funded Warrants acquired as part of the Pre-Funded Warrant Units, the exercise, disposition, and lapse of Warrants acquired as part of the Offered Share Units or the Pre-Funded Warrant Units, the acquisition, ownership, and disposition of Offered Shares received upon exercise of the Pre-Funded Warrants, and the acquisition, ownership and disposition of Offered Shares received upon exercise of the Warrants (as used in this summary, the “Warrant Shares”), all as acquired pursuant to this offering. This summary is for general information purposes only and does not purport to be a complete analysis or listing of all potential U.S. federal income tax considerations that may apply to a U.S. Holder arising from or relating to the acquisition, ownership and disposition of Offered Share Units or Pre-Funded Warrant Units acquired pursuant to this offering. In addition, this summary does not take into account the individual facts and circumstances of any particular U.S. Holder that may affect the U.S. federal income tax consequences to such U.S. Holder, including, without limitation, specific tax consequences to a U.S. Holder under an applicable income tax treaty. Accordingly, this summary is not intended to be, and should not be construed as, legal or U.S. federal income tax advice with respect to any particular U.S. Holder. This summary does not address the U.S. federal alternative minimum, U.S. federal net investment income, U.S. federal estate and gift, U.S. state and local, and non-U.S. tax consequences to U.S. Holders of the acquisition, ownership and disposition of Offered Share Units, Pre-Funded Warrant Units, Offered Shares, Pre-Funded Warrants, Warrants and Warrant Shares. In addition, except as specifically set forth below, this summary does not discuss applicable income tax reporting requirements. Each prospective U.S. Holder should consult its own tax advisors regarding the U.S. federal income, U.S. federal alternative minimum, U.S. federal net investment income, U.S. federal estate and gift, U.S. state and local, and non-U.S. tax consequences relating to the acquisition, ownership and disposition of Offered Share Units, Pre-Funded Warrant Units, Offered Shares, Pre-Funded Warrants, Warrants and Warrant Shares.

No ruling from the Internal Revenue Service (the “IRS”) has been requested, or will be obtained, regarding the U.S. federal income tax consequences of the acquisition, ownership and disposition of Offered Share Units, Pre-Funded Warrant Units, Offered Shares, Pre-Funded Warrants, Warrants and Warrant Shares. This summary is not binding on the IRS, and the IRS is not precluded from taking a position that is different from, or contrary to, the positions taken in this summary. In addition, because the authorities on which this summary is based are subject to various interpretations, the IRS and the U.S. courts could disagree with one or more of the conclusions described in this summary.

Scope of this Summary

Authorities

This summary is based on the U.S. Internal Revenue Code of 1986, as amended (the “Code”), Treasury Regulations (whether final, temporary, or proposed) promulgated thereunder, published rulings of the IRS, published administrative positions of the IRS, the current provisions of the Convention Between Canada and the United States of America with respect to Taxes on Income and on Capital of 1980, as amended (the “Canada-U.S. Tax Treaty”), and U.S. court decisions that are applicable, and, in each case, as in effect and available, as of the date of this document. Any of the authorities on which this summary is based could be changed in a material and adverse manner at any time, and any such change could be applied on a retroactive or prospective basis, which could affect the U.S. federal income tax considerations described in this summary. Except as provided herein, this summary does not discuss the potential effects, whether adverse or beneficial, of any proposed legislation that, if enacted, could be applied on a retroactive or prospective basis.

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U.S. Holders

For purposes of this summary, the term “U.S. Holder” means a beneficial owner of Offered Share Units, Pre-Warrant Funded Units, Offered Shares, Pre-Funded Warrants, Warrants or Warrant Shares as acquired pursuant to this offering, that is for U.S. federal income tax purposes:

- An individual who is a citizen or resident of the United States;
- a corporation (or other entity treated as a corporation for U.S. federal income tax purposes) organized under the laws of the United States, any state thereof or the District of Columbia;
- an estate whose income is subject to U.S. federal income taxation regardless of its source; or
- a trust that (1) is subject to the primary supervision of a court within the U.S. and the control of one or more U.S. persons for all substantial decisions or (2) has a valid election in effect under applicable Treasury Regulations to be treated as a U.S. person.

Non-U.S. Holders

For purposes of this summary, a “non-U.S. Holder” is a beneficial owner of Offered Share Units, Pre-Funded Warrant Units, Offered Shares, Pre-Funded Warrants, Warrants or Warrant Shares that is not a U.S. Holder or an entity or arrangement classified as a partnership for U.S. federal income tax purposes. This summary does not address the U.S. federal, state or local tax consequences to non-U.S. Holders arising from or relating to the acquisition, ownership and disposition of Offered Share Units, Pre-Funded Warrant Units, Offered Shares, Pre-Funded Warrants, Warrants and Warrant Shares. Accordingly, a non-U.S. Holder should consult its own tax advisors regarding the U.S. federal, state or local and non-U.S. tax consequences (including the potential application of and operation of any income tax treaties) relating to the acquisition, ownership and disposition of Offered Share Units, Pre-Funded Warrant Units, Offered Shares, Pre-Funded Warrants, Warrants and Warrant Shares.

U.S. Holders Subject to Special U.S. Federal Income Tax Rules Not Addressed

This summary does not address the U.S. federal income tax considerations applicable to U.S. Holders that are subject to special provisions under the Code, including, but not limited to U.S. Holders that: (a) are tax-exempt organizations, qualified retirement plans, individual retirement accounts, or other tax-deferred accounts; (b) are financial institutions, underwriters, insurance companies, real estate investment trusts, or regulated investment companies; (c) are broker-dealers, dealers, or traders in securities or currencies that elect to apply a mark-to-market accounting method; (d) have a “functional currency” other than the U.S. dollar; (e) own Offered Share Units, Pre-Funded Warrant Units, Offered Shares, Pre-Funded Warrants, Warrants and Warrant Shares as part of a straddle, hedging transaction, conversion transaction, constructive sale, or other integrated transaction; (f) acquire Offered Share Units, Pre-Funded Warrant Units, Offered Shares, Pre-Funded Warrants, Warrants and Warrant Shares in connection with the exercise of employee stock options or otherwise as compensation for services; (g) hold Offered Share Units, Pre-Funded Warrant Units, Offered Shares, Pre-Funded Warrants, Warrants and Warrant Shares other than as a capital asset within the meaning of Section 1221 of the Code (generally, property held for investment purposes); (h) are subject to the alternative minimum tax; (i) are subject to special tax accounting rules with respect to the Offered Share Units, Pre-Funded Warrant Units, Offered Shares, Pre-Funded Warrants, Warrants and Warrant Shares; (j) are partnerships or other “pass-through” entities (and partners or other owners thereof); (k) are S corporations (and shareholders thereof); (l) are U.S. expatriates or former long-term residents of the United States subject to Section 877 or 877A of the Code; (m) hold Offered Share Units, Pre-Funded Warrant Units, Offered Shares, Pre-Funded Warrants, Warrants and Warrant Shares in connection with a trade or business, permanent establishment, or fixed base outside the United States; or (n) own or have owned or will own (directly, indirectly, or by attribution) 10% or more of the total combined voting power or value of our outstanding shares. U.S. Holders that are subject to special provisions under the Code, including, but not limited to, U.S. Holders described immediately above, should consult their own tax advisors regarding the U.S. federal income, U.S. federal alternative minimum, U.S. federal net investment income, U.S. federal estate and gift, U.S. state and local, and non-U.S. tax consequences relating to the acquisition, ownership and disposition of Offered Share Units, Pre-Funded Warrant Units, Offered Shares, Pre-Funded Warrants, Warrants and Warrant Shares.

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If an entity or arrangement that is classified as a partnership (or other “pass-through” entity) for U.S. federal income tax purposes holds Offered Share Units, Pre-Funded Warrant Units, Offered Shares, Pre-Funded Warrants, Warrants and Warrant Shares, the U.S. federal income tax consequences to such entity or arrangement and the partners (or other owners or participants) of such entity or arrangement generally will depend on the activities of the entity or arrangement and the status of such partners (or owners or participants). This summary does not address the tax consequences to any such partner (or owner or participant). Partners (or other owners or participants) of entities or arrangements that are classified as partnerships or as “pass-through” entities for U.S. federal income tax purposes should consult their own tax advisors regarding the U.S. federal income tax consequences arising from and relating to the acquisition, ownership and disposition of Offered Share Units, Pre-Funded Warrant Units, Offered Shares, Pre-Funded Warrants, Warrants and Warrant Shares.

U.S. Federal Income Tax Consequences of the Acquisition of Offered Share Units or Pre-Funded Warrant Units

For U.S. federal income tax purposes, the acquisition by a U.S. Holder of an Offered Share Unit will be treated as the acquisition of one Offered Share and one Warrant. The purchase price for each Offered Share Unit will be allocated between these two components in proportion to their relative fair market values at the time the Offered Share Unit is purchased by the U.S. Holder. This allocation of the purchase price for each Offered Share Unit will establish a U.S. Holder’s initial tax basis for U.S. federal income tax purposes in the Offered Share and one Warrant that comprise each Offered Share Unit.

For this purpose, we will allocate US\$2.30 of the purchase price for the Offered Share Unit to the Offered Share and US\$0.01 of the purchase price for each Offered Share Unit to the Warrant. However, the IRS will not be bound by such allocation of the purchase price for the Offered Share Units, and therefore, the IRS or a U.S. court may not respect the allocation set forth above. Each U.S. Holder should consult its own tax advisor regarding the allocation of the purchase price for the Offered Share Units.

For U.S. federal income tax purposes, the acquisition by a U.S. Holder of a Pre-Funded Warrant Unit will be treated as the acquisition of one Pre-Funded Warrant and one Warrant. The purchase price for each Pre-Funded Warrant Unit will be allocated between these two components in proportion to their relative fair market values at the time the Pre-Funded Warrant Unit is purchased by the U.S. Holder. This allocation of the purchase price for each Pre-Funded Warrant Unit will establish a U.S. Holder’s initial tax basis for U.S. federal income tax purposes in the Pre-Funded Warrant and one Warrant that comprise each Pre-Funded Warrant Unit.

For this purpose, we will allocate US\$2.30 of the purchase price for the Pre-Funded Warrant Unit to the Pre-Funded Warrant and US\$0.01 of the purchase price for each Pre-Funded Warrant Unit to the Warrant. However, the IRS will not be bound by such allocation of the purchase price for the Pre-Funded Warrant Units, and therefore, the IRS or a U.S. court may not respect the allocation set forth above. Each U.S. Holder should consult its own tax advisor regarding the allocation of the purchase price for the Pre-Funded Warrant Units.

Treatment of Pre-Funded Warrants

Although it is not entirely free from doubt, we believe that a Pre-Funded Warrant should be treated as a separate class of our common shares for U.S. federal income tax purposes and a U.S. Holder of Pre-Funded Warrants should generally be taxed in the same manner as a holder of Offered Shares except as described below. Accordingly, no gain or loss should be recognized upon the exercise of a Pre-Funded Warrant and, upon exercise, the holding period of a Pre-Funded Warrant should carry over to the Offered Shares received. Similarly, the tax basis of the Pre-Funded Warrant should carry over to the Offered Shares received upon exercise, increased by the exercise price of \$0.01 per Offered Share. However, such characterization is not binding on the IRS, and the IRS may treat the Pre-Funded Warrants as warrants to acquire Offered Shares. If so, the amount and character of a U.S. Holder’s gain with respect to an investment in Pre-Funded Warrants could change, and a U.S. Holder may not be entitled to make the “QEF Election” described below with respect to the Pre-Funded Warrants to mitigate PFIC consequences in the event that

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we are classified as a PFIC. A U.S. Holder generally may not make a Mark-to-Market Election with respect to the Pre-Funded Warrants. Accordingly, each U.S. Holder should consult its own tax advisor regarding the risks associated with the acquisition of a Pre-Funded Warrant pursuant to this offering (including potential alternative characterizations). The balance of this discussion generally assumes that the characterization described above is respected for U.S. federal income tax purposes.

Passive Foreign Investment Company Rules

If we were to constitute a “passive foreign investment company” or “PFIC” for any year during a U.S. Holder’s holding period, then certain potentially adverse rules would affect the U.S. federal income tax consequences to a U.S. Holder resulting from the acquisition, ownership and disposition of Offered Share Units, Pre-Funded Warrant Units, Offered Shares, Pre-Funded Warrants, Warrants and Warrant Shares. We believe we were a “passive foreign investment company” (a “PFIC”) within the meaning of Section 1297 of the Code for our most recently completed taxable year and based on the nature of our business, the projected composition of our gross income and the projected composition and estimated fair market values of our assets, we expect to be a PFIC for our current taxable year and may be a PFIC in subsequent tax years. No opinion of legal counsel or ruling from the IRS concerning our status as a PFIC has been obtained or is currently planned to be requested. The determination of whether any corporation was, or will be, a PFIC for a tax year depends, in part, on the application of complex U.S. federal income tax rules, which are subject to differing interpretations. In addition, whether any corporation will be a PFIC for any tax year depends on the assets and income of such corporation over the course of each such tax year and, as a result, cannot be predicted with certainty as of the date of this document. Accordingly, there can be no assurance that the IRS will not challenge any determination made by us (or any of our non-U.S. subsidiaries) concerning our (or its) PFIC status. Each U.S. Holder should consult its own tax advisors regarding our PFIC status of the PFIC status of each of our non-U.S. subsidiaries.

In any year in which we are classified as a PFIC, a U.S. Holder will be required to file an annual report with the IRS containing such information as Treasury Regulations and/or other IRS guidance may require. In addition to penalties, a failure to satisfy such reporting requirements may result in an extension of the time period during which the IRS can assess a tax. U.S. Holders should consult their own tax advisors regarding the requirements of filing such information returns under these rules, including the requirement to file an IRS Form 8621 annually.

We generally will be a PFIC if, for a tax year, (a) 75% or more of our gross income in such tax year is passive income (the “PFIC income test”) or (b) 50% or more of the value of our assets either produce passive income or are held for the production of passive income, based on the quarterly average of the fair market value of such assets (the “PFIC asset test”). “Gross income” generally includes all sales revenues less the cost of goods sold, plus income from investments and from incidental or outside operations or sources, and “passive income” generally includes, for example, dividends, interest, certain rents and royalties, certain gains from the sale of stock and securities, and certain gains from commodities transactions. Active business gains arising from the sale of commodities generally are excluded from passive income if substantially all of a foreign corporation’s commodities are stock in trade or inventory, depreciable property used in a trade or business, or supplies regularly used or consumed in the ordinary course of its trade or business, and certain other requirements are satisfied.

For purposes of the PFIC income test and PFIC asset test described above, if we own, directly or indirectly, 25% or more of the total value of the outstanding shares of another corporation, we will be treated as if we (a) held a proportionate share of the assets of such other corporation and (b) received directly a proportionate share of the income of such other corporation. In addition, for purposes of the PFIC income test and PFIC asset test described above, and assuming certain other requirements are met, “passive income” does not include certain interest, dividends, rents, or royalties that are received or accrued by us from certain “related persons” (as defined in Section 954(d)(3) of the Code) also organized in Canada, to the extent such items are properly allocable to the income of such related person that is not passive income.

Under certain attribution rules, if we are a PFIC, U.S. Holders will generally be deemed to own their proportionate share of our direct or indirect equity interest in any company that is also a PFIC (a “Subsidiary PFIC”), and will generally be subject to U.S. federal income tax as described below under “*Default PFIC Rules Under Section 1291 of the Code*” on their proportionate share of (a) any “excess distributions,” as described below, on the stock of a Subsidiary PFIC and (b) a disposition or deemed disposition of the stock of a Subsidiary PFIC by us or another

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Subsidiary PFIC, both as if such U.S. Holders directly held the shares of such Subsidiary PFIC. In addition, U.S. Holders may be subject to U.S. federal income tax on any indirect gain realized on the stock of a Subsidiary PFIC on the sale or disposition of Offered Share Units, Pre-Funded Warrant Units, Offered Shares, Pre-Funded Warrants, Warrants or Warrant Shares. Accordingly, U.S. Holders should be aware that they could be subject to tax under the PFIC rules even if no distributions are received and no redemptions or other dispositions of Offered Share Units, Pre-Funded Warrant Units, Offered Shares, Pre-Funded Warrants, Warrants or Warrant Shares are made.

Default PFIC Rules Under Section 1291 of the Code

If we are a PFIC for any tax year during which a U.S. Holder owns Offered Share Units, Pre-Funded Warrant Units, Offered Shares, Pre-Funded Warrants, Warrants or Warrant Shares, the U.S. federal income tax consequences to such U.S. Holder of the acquisition, ownership, and disposition of Offered Share Units, Pre-Funded Warrant Units, Offered Shares, Pre-Funded Warrants, Warrants or Warrant Shares will depend on whether such U.S. Holder makes a “qualified electing fund” or “QEF” election (a “QEF Election”) with respect to the Offered Shares, Pre-Funded Warrants or Warrant Shares or makes a mark-to-market election under Section 1296 of the Code (a “Mark-to-Market Election”) with respect to Offered Shares or Warrant Shares. A U.S. Holder that does not make either a QEF Election or a Mark-to-Market Election (a “Non-Electing U.S. Holder”) will be taxable as described below.

A Non-Electing U.S. Holder will be subject to the rules of Section 1291 of the Code (described below) with respect to: (a) any gain recognized on the sale or other taxable disposition of Offered Shares, Pre-Funded Warrants, Warrants and Warrant Shares; and (b) any “excess distribution” received on the Offered Shares, Pre-Funded Warrants, Warrants and Warrant Shares. A distribution generally will be an “excess distribution” to the extent that such distribution (together with all other distributions received in the current tax year) exceeds 125% of the average distributions received during the three preceding tax years (or during a U.S. Holder’s holding period for the Offered Shares, Pre-Funded Warrants, Warrants or Warrant Shares, if shorter).

Under Section 1291 of the Code, any gain recognized on the sale or other taxable disposition of Offered Shares, Pre-Funded Warrants, Warrants and Warrant Shares of a PFIC (including an indirect disposition of the stock of any Subsidiary PFIC), and any “excess distribution” received on Offered Shares, Pre-Funded Warrants and Warrant Shares or a distribution by a Subsidiary PFIC to its shareholder that is deemed to be received by a U.S. Holder (including a constructive distribution on the Warrants), must be ratably allocated to each day in a Non-Electing U.S. Holder’s holding period for the respective Offered Shares, Pre-Funded Warrants, Warrants and Warrant Shares. The amount of any such gain or excess distribution allocated to the tax year of disposition or distribution of the excess distribution and to years before the entity became a PFIC, if any, would be taxed as ordinary income (and not eligible for certain preferential tax rates, as discussed below). The amounts allocated to any other tax year would be subject to U.S. federal income tax at the highest tax rate applicable to ordinary income in each such year, and an interest charge would be imposed on the tax liability for each such year, calculated as if such tax liability had been due in each such year. A Non-Electing U.S. Holder that is not a corporation must treat any such interest paid as “personal interest,” which is not deductible.

If we are a PFIC for any tax year during which a Non-Electing U.S. Holder holds Offered Shares, Pre-Funded Warrants, Warrants or Warrant Shares, we will continue to be treated as a PFIC with respect to such Non-Electing U.S. Holder, regardless of whether we cease to be a PFIC in one or more subsequent tax years. If we cease to be a PFIC, a Non-Electing U.S. Holder may terminate this deemed PFIC status with respect to Offered Shares, Pre-Funded Warrants and Warrant Shares by electing to recognize gain (which will be taxed under the rules of Section 1291 of the Code discussed above), but not loss, as if such Offered Shares, Pre-Funded Warrants and Warrant Shares were sold on the last day of the last tax year for which we were a PFIC. No such election, however, may be made with respect to the Warrants.

Under proposed Treasury Regulations, if a U.S. Holder has an option, warrant, or other right to acquire stock of a PFIC (such as the Warrants), such option, warrant or right is considered to be PFIC stock subject to the default rules of Section 1291 of the Code. Under rules described below, the holding period for the Warrant Shares will begin on the date a U.S. Holder acquires the Offered Share Units or Pre-Funded Warrant Unit, as applicable. This will impact the availability of the QEF Election and Mark-to-Market Election with respect to the Warrant Shares. Thus, a U.S. Holder will have to account for Warrant Shares, Pre-Funded Warrants and Offered Shares under the PFIC rules and the applicable elections differently.

QEF Election

A U.S. Holder that makes a timely and effective QEF Election for the first tax year in which the holding period of its Offered Shares or Pre-Funded Warrants begins generally will not be subject to the rules of Section 1291 of the Code discussed above with respect to its Offered Shares or Pre-Funded Warrants. However, a U.S. Holder that makes a timely and effective QEF Election will be subject to U.S. federal income tax on such U.S. Holder's pro rata share of (a) our net capital gain, which will be taxed as long-term capital gain to such U.S. Holder, and (b) our ordinary earnings, which will be taxed as ordinary income to such U.S. Holder. Generally, "net capital gain" is the excess of (a) net long-term capital gain over (b) net short-term capital loss, and "ordinary earnings" are the excess of (a) "earnings and profits" over (b) net capital gain. A U.S. Holder that makes a QEF Election will be subject to U.S. federal income tax on such amounts for each tax year in which we are a PFIC, regardless of whether such amounts are actually distributed to such U.S. Holder by us. However, for any tax year in which we are a PFIC and have no net income or gain, U.S. Holders that have made a QEF Election would not have any income inclusions as a result of the QEF Election. If a U.S. Holder that made a QEF Election has an income inclusion, such a U.S. Holder may, subject to certain limitations, elect to defer payment of current U.S. federal income tax on such amounts, subject to an interest charge. If such U.S. Holder is not a corporation, any such interest paid will be treated as "personal interest," which is not deductible.

A U.S. Holder that makes a timely and effective QEF Election with respect to us generally (a) may receive tax-free distribution from us to the extent that such distribution represents our "earnings and profits" that were previously included in income by the U.S. Holder because of such QEF Election and (b) will adjust such U.S. Holder's tax basis in the Offered Shares or Pre-Funded Warrants to reflect the amount included in income or allowed as a tax-free distribution because of such QEF Election. In addition, a U.S. Holder that makes a QEF Election generally will recognize capital gain or loss on the sale or other taxable disposition of Offered Shares or Pre-Funded Warrants.

The procedure for making a QEF Election, and the U.S. federal income tax consequences of making a QEF Election, will depend on whether such QEF Election is timely. A QEF Election will be treated as "timely" for purposes of avoiding the default PFIC rules discussed above if such QEF Election is made for the first year in the U.S. Holder's holding period for the Offered Shares or Pre-Funded Warrants in which we are a PFIC. A U.S. Holder may make a timely QEF Election by filing the appropriate QEF Election documents at the time such U.S. Holder files a U.S. federal income tax return for such year.

A QEF Election will apply to the tax year for which such QEF Election is timely made and to all subsequent tax years, unless such QEF Election is invalidated or terminated or the IRS consents to revocation of such QEF Election. If a U.S. Holder makes a QEF Election and, in a subsequent tax year, we cease to be a PFIC, the QEF Election will remain in effect (although it will not be applicable) during those tax years in which we are not a PFIC. Accordingly, if we become a PFIC in another subsequent tax year, the QEF Election will be effective and the U.S. Holder will be subject to the QEF rules described above during any subsequent tax year in which we qualify as a PFIC.

As discussed above, under proposed Treasury Regulations, if a U.S. Holder has an option, warrant or other right to acquire stock of a PFIC (such as the Warrants), such option, warrant or right is considered to be PFIC stock subject to the default rules of Section 1291 of the Code. However, a U.S. Holder of an option, warrant or other right to acquire stock of a PFIC may not make a QEF Election that will apply to the option, warrant or other right to acquire PFIC stock. In addition, under proposed Treasury Regulations, if a U.S. Holder holds an option, warrant or other right to acquire stock of a PFIC, the holding period with respect to shares of stock of the PFIC acquired upon exercise of such option, warrant or other right will include the period that the option, warrant or other right was held.

Consequently, under the proposed Treasury Regulations, if a U.S. Holder of Offered Shares makes a QEF Election, such election generally will not be treated as a timely QEF Election with respect to Warrant Shares and the rules of Section 1291 of the Code discussed above will continue to apply with respect to such U.S. Holder's Warrant Shares. However, a U.S. Holder of Warrant Shares should be eligible to make a timely QEF Election if such U.S. Holder makes a "purging" or "deemed sale" election to recognize gain (which will be taxed under the default rules of Section 1291 of the Code discussed above) as if such Warrant Shares were sold for fair market value. As a result of the "purging" or "deemed sale" election, the U.S. Holder will have a new basis and holding period in the Warrant

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Shares acquired upon the exercise of the Warrants for purposes of the PFIC rules. In addition, gain recognized on the sale or other taxable disposition (other than by exercise) of the Warrants by a U.S. Holder will be subject to the rules of Section 1291 of the Code discussed above. Each U.S. Holder should consult its own tax advisor regarding the application of the PFIC rules to the Offered Share Purchase Units, Pre-Funded Warrant Units, Offered Shares, Pre-Funded Warrants, Warrants, and Warrant Shares.

U.S. Holders should be aware that there can be no assurances that we will satisfy the record keeping requirements that apply to a QEF, or that we will supply U.S. Holders with information that such U.S. Holders are required to report under the QEF rules, in the event that we are a PFIC. Thus, U.S. Holders may not be able to make a QEF Election with respect to their Offered Shares, Pre-Funded Warrants or Warrant Shares. Each U.S. Holder should consult its own tax advisors regarding the availability of, and procedure for making, a QEF Election with respect to us and any Subsidiary PFIC.

A U.S. Holder makes a QEF Election by attaching a completed IRS Form 8621, including a PFIC Annual Information Statement, to a timely filed United States federal income tax return. However, if we do not provide the required information with regard to us or any of our Subsidiary PFICs, U.S. Holders will not be able to make a QEF Election for such entity and will continue to be subject to the rules of Section 1291 of the Code discussed above that apply to Non-Electing U.S. Holders with respect to the taxation of gains and excess distributions.

Mark-to-Market Election

A U.S. Holder may make a Mark-to-Market Election with respect to Offered Shares and Warrant Shares only if the Offered Shares and Warrant Shares are marketable stock. The Offered Shares and Warrant Shares generally will be “marketable stock” if the Offered Shares and Warrant Shares are regularly traded on (a) a national securities exchange that is registered with the SEC, (b) the national market system established pursuant to section 11A of the Exchange Act, or (c) a foreign securities exchange that is regulated or supervised by a governmental authority of the country in which the market is located, provided that (i) such foreign exchange has trading volume, listing, financial disclosure, and surveillance requirements, and meets other requirements and the laws of the country in which such foreign exchange is located, together with the rules of such foreign exchange, ensure that such requirements are actually enforced and (ii) the rules of such foreign exchange effectively promote active trading of listed stocks. If such stock is traded on such a qualified exchange or other market, such stock generally will be “regularly traded” for any calendar year during which such stock is traded, other than in de minimis quantities, on at least 15 days during each calendar quarter. Each U.S. Holder should consult its own tax advisor in this matter.

A U.S. Holder that makes a Mark-to-Market Election with respect to its Offered Shares generally will not be subject to the rules of Section 1291 of the Code discussed above with respect to such Offered Shares. However, if a U.S. Holder does not make a Mark-to-Market Election beginning in the first tax year of such U.S. Holder’s holding period for the Offered Shares for which we are a PFIC and such U.S. Holder has not made a timely QEF Election, the rules of Section 1291 of the Code discussed above will apply to certain dispositions of, and distributions on, the Offered Shares.

Any Mark-to-Market Election made by a U.S. Holder for the Offered Shares will also apply to such U.S. Holder’s Warrant Shares. As a result, if a Mark-to-Market Election has been made by a U.S. Holder with respect to Offered Shares, any Warrant Shares received will automatically be marked-to-market in the year of exercise. Because, under the proposed Treasury Regulations, a U.S. Holder’s holding period for Warrant Shares includes the period during which such U.S. Holder held the Warrants, a U.S. Holder will be treated as making a Mark-to-Market Election with respect to its Warrant Shares after the beginning of such U.S. Holder’s holding period for the Warrant Shares unless the Warrant Shares are acquired in the same tax year as the year in which the U.S. Holder acquired its Offered Share Units or Pre-Funded Warrant Units, as applicable. Consequently, the default rules under Section 1291 described above generally will apply to the mark-to-market gain realized in the tax year in which Warrant Shares are received upon the exercise of the Warrants. However, the general mark-to-market rules will apply to subsequent tax years.

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Any Mark-to-Market Election made by a U.S. Holder for the Offered Shares will also apply to such U.S. Holder's Offered Shares received upon exercise of a Pre-Funded Warrant. As a result, if a Mark-to-Market Election has been made by a U.S. Holder with respect to Offered Shares, any Offered Shares received upon exercise of a Pre-Funded Warrant will automatically be marked-to-market in the year of exercise. Because a U.S. Holder's holding period for Offered Shares received upon exercise of a Pre-Funded Warrant should include the period during which such U.S. Holder held the Pre-Funded Warrant, a U.S. Holder will be treated as making a Mark-to-Market Election with respect to such Offered Shares after the beginning of such U.S. Holder's holding period for such Offered Shares unless such Offered Shares are acquired in the same tax year as the year in which the U.S. Holder acquired its Pre-Funded Warrant Units. Consequently, the default rules under Section 1291 described above generally will apply to the mark-to-market gain realized in the tax year in which such Offered Shares are received upon the exercise of the Pre-Funded Warrants. However, the general mark-to-market rules will apply to subsequent tax years.

A U.S. Holder that makes a Mark-to-Market Election will include in ordinary income, for each tax year in which we are a PFIC, an amount equal to the excess, if any, of (a) the fair market value of the Offered Shares and any Warrant Shares, as of the close of such tax year over (b) such U.S. Holder's adjusted tax basis in such Offered Shares and any Warrant Shares. A U.S. Holder that makes a Mark-to-Market Election will be allowed a deduction in an amount equal to the excess, if any, of (a) such U.S. Holder's adjusted tax basis in the Offered Shares and any Warrant Shares, over (b) the fair market value of such Offered Shares and any Warrant Shares (but only to the extent of the net amount of previously included income as a result of the Mark-to-Market Election for prior tax years).

A U.S. Holder that makes a Mark-to-Market Election generally also will adjust such U.S. Holder's tax basis in the Offered Shares and Warrant Shares to reflect the amount included in gross income or allowed as a deduction because of such Mark-to-Market Election. In addition, upon a sale or other taxable disposition of Offered Shares and Warrant Shares, a U.S. Holder that makes a Mark-to-Market Election will recognize ordinary income or ordinary loss (not to exceed the excess, if any, of (a) the amount included in ordinary income because of such Mark-to-Market Election for prior tax years over (b) the amount allowed as a deduction because of such Mark-to-Market Election for prior tax years). Losses that exceed this limitation are subject to the rules generally applicable to losses provided in the Code and Treasury Regulations.

A U.S. Holder makes a Mark-to-Market Election by attaching a completed IRS Form 8621 to a timely filed United States federal income tax return. A Mark-to-Market Election applies to the tax year in which such Mark-to-Market Election is made and to each subsequent tax year, unless the Offered Shares and Warrant Shares cease to be "marketable stock" or the IRS consents to revocation of such election. Each U.S. Holder should consult its own tax advisors regarding the availability of, and procedure for making, a Mark-to-Market Election.

Although a U.S. Holder may be eligible to make a Mark-to-Market Election with respect to the Offered Shares and Warrant Shares, no such election may be made with respect to the stock of any Subsidiary PFIC that a U.S. Holder is treated as owning, because such stock is not marketable. Hence, the Mark-to-Market Election will not be effective to eliminate the interest charge and other income inclusion rules described above with respect to deemed dispositions of Subsidiary PFIC stock or distributions from a Subsidiary PFIC to its shareholder.

Other PFIC Rules

Under Section 1291(f) of the Code, the IRS has issued proposed Treasury Regulations that, subject to certain exceptions, would cause a U.S. Holder that had not made a timely QEF Election to recognize gain (but not loss) upon certain transfers of Offered Shares, Pre-Funded Warrants, Warrants and Warrant Shares that would otherwise be tax-deferred (e.g., gifts and exchanges pursuant to corporate reorganizations). However, the specific U.S. federal income tax consequences to a U.S. Holder may vary based on the manner in which Offered Shares, Pre-Funded Warrants, Warrants, and Warrant Shares are transferred.

If finalized in their current form, the proposed Treasury Regulations applicable to PFICs would be effective for transactions occurring on or after April 1, 1992. Because the proposed Treasury Regulations have not yet been adopted in final form, they are not currently effective, and there is no assurance that they will be adopted in the form and with the effective date proposed. Nevertheless, the IRS has announced that, in the absence of final Treasury Regulations, taxpayers may apply reasonable interpretations of the Code provisions applicable to PFICs and that it considers the rules set forth in the proposed Treasury Regulations to be reasonable interpretations of those Code provisions. The PFIC rules are complex, and the implementation of certain aspects of the PFIC rules requires the issuance of Treasury Regulations which in many instances have not been promulgated and which, when promulgated, may have retroactive effect. U.S. Holders should consult their own tax advisors about the potential applicability of the proposed Treasury Regulations.

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Certain additional adverse rules may apply with respect to a U.S. Holder if we are a PFIC, regardless of whether such U.S. Holder makes a QEF Election. For example, under Section 1298(b)(6) of the Code, a U.S. Holder that uses Offered Shares, Pre-Funded Warrants, Warrants or Warrant Shares as security for a loan will, except as may be provided in Treasury Regulations, be treated as having made a taxable disposition of such Offered Shares, Pre-Funded Warrants, Warrants or Warrant Shares.

In addition, a U.S. Holder who acquires Offered Shares, Pre-Funded Warrants, Warrants or Warrant Shares from a decedent will not receive a “step up” in tax basis of such Offered Shares, Pre-Funded Warrants, Warrants or Warrant Shares to fair market value unless such decedent had a timely and effective QEF Election in place.

Special rules also apply to the amount of foreign tax credit that a U.S. Holder may claim on a distribution from a PFIC. Subject to such special rules, foreign taxes paid with respect to any distribution in respect of stock in a PFIC are generally eligible for the foreign tax credit. The rules relating to distributions by a PFIC and their eligibility for the foreign tax credit are complicated, and a U.S. Holder should consult with its own tax advisors regarding the availability of the foreign tax credit with respect to distributions by a PFIC.

The PFIC rules are complex, and each U.S. Holder should consult its own tax advisors regarding the PFIC rules (including the availability and advisability of making a QEF Election or Mark-to-Market Election) and how the PFIC rules may affect the U.S. federal income tax consequences of the acquisition, ownership, and disposition of Offered Shares, Pre-Funded Warrants, Warrants or Warrant Shares.

Certain additional adverse rules may apply with respect to a U.S. Holder if we are a PFIC, regardless of whether the U.S. Holder makes a QEF Election. These rules include special rules that apply to the amount of foreign tax credit that a U.S. Holder may claim on a distribution from a PFIC. Subject to these special rules, foreign taxes paid with respect to any distribution in respect of stock in a PFIC are generally eligible for the foreign tax credit. U.S. Holders are urged to consult their own tax advisors regarding the potential application of the PFIC rules to the ownership and disposition of Offered Shares, Pre-Funded Warrants, Warrants or Warrant Shares, and the availability of certain U.S. tax elections under the PFIC rules.

U.S. Federal Income Tax Consequences of the Exercise and Disposition of Warrants

The following discussion describes the general rules applicable to the ownership and disposition of the Warrants but is subject in its entirety to the special rules described above under the heading “*Passive Foreign Investment Company Rules.*”

Exercise of Warrants

A U.S. Holder should not recognize gain or loss on the exercise of a Warrant and related receipt of a Warrant Share (unless cash is received in lieu of the issuance of a fractional Warrant Share). A U.S. Holder’s initial tax basis in the Warrant Share received on the exercise of a Warrant should be equal to the sum of (a) such U.S. Holder’s tax basis in such Warrant plus (b) the exercise price paid by such U.S. Holder on the exercise of such Warrant. It is unclear whether a U.S. Holder’s holding period for the Warrant Share received on the exercise of a Warrant would commence on the date of exercise of the Warrant or the day following the date of exercise of the Warrant. If we are a PFIC, a U.S. Holder’s holding period for the Warrant Share for PFIC purposes will begin on the date on which such U.S. Holder acquired its Offered Share Units or Pre-Funded Warrant Units, as applicable.

In certain limited circumstances, a U.S. Holder may be permitted to undertake a cashless exercise of Warrants into Warrant Shares. The U.S. federal income tax treatment of a cashless exercise of Warrants into Warrant Shares is unclear, and the tax consequences of a cashless exercise could differ from the consequences upon the exercise of a Warrant described in the preceding paragraph. U.S. Holders should consult their own tax advisors regarding the U.S. federal income tax consequences of a cashless exercise of Warrants.

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Disposition of Warrants

A U.S. Holder will recognize gain or loss on the sale or other taxable disposition of a Warrant in an amount equal to the difference, if any, between (a) the amount of cash plus the fair market value of any property received and (b) such U.S. Holder's tax basis in the Warrant sold or otherwise disposed of. Subject to the PFIC rules discussed above, any such gain or loss generally will be a capital gain or loss, which will be long-term capital gain or loss if the Warrant is held for more than one year. Deductions for capital losses are subject to complex limitations under the Code.

Expiration of Warrants Without Exercise

Upon the lapse or expiration of a Warrant, a U.S. Holder will recognize a loss in an amount equal to such U.S. Holder's tax basis in the Warrant. Any such loss generally will be a capital loss and will be long-term capital loss if the Warrants are held for more than one year. Deductions for capital losses are subject to complex limitations under the Code.

Certain Adjustments to the Warrants

Under Section 305 of the Code, an adjustment to the number of Warrant Shares that will be issued on the exercise of the Warrants, or an adjustment to the exercise price of the Warrants, may be treated as a constructive distribution to a U.S. Holder of the Warrants if, and to the extent that, such adjustment has the effect of increasing such U.S. Holder's proportionate interest in the "earnings and profits" or our assets, depending on the circumstances of such adjustment (for example, if such adjustment is to compensate for a distribution of cash or other property to the shareholders). Adjustments to the exercise price of Warrants made pursuant to a bona fide reasonable adjustment formula that has the effect of preventing dilution of the interest of the holders of the Warrants should generally not be considered to result in a constructive distribution. Any such constructive distribution would be taxable whether or not there is an actual distribution of cash or other property. (See more detailed discussion of the rules applicable to distributions made by us at "*Distributions on Offered Shares, Pre-Funded Warrants and Warrant Shares*" below).

General Rules Applicable to the Ownership and Disposition of Offered Shares, Pre-Funded Warrants and Warrant Shares

The following discussion is subject, in its entirety, to the rules described above under the heading "*Passive Foreign Investment Company Rules*".

Distributions on Offered Shares, Pre-Funded Warrants and Warrant Shares

A U.S. Holder that receives a distribution, including a constructive distribution, with respect to an Offered Share, Pre-Funded Warrant or Warrant Share (as well as any constructive distribution on a Warrant) will be required to include the amount of such distribution in gross income as a dividend (without reduction for any Canadian income tax withheld from such distribution) to the extent of our current or accumulated "earnings and profits", as computed for U.S. federal income tax purposes. A dividend generally will be taxed to a U.S. Holder at ordinary income tax rates if we are a PFIC for the tax year of such distribution or were a PFIC for the preceding tax year. To the extent that a distribution exceeds our current and accumulated "earnings and profits", such distribution will be treated first as a tax-free return of capital to the extent of a U.S. Holder's tax basis in the Offered Shares, Pre-Funded Warrants or Warrant Shares and thereafter as gain from the sale or exchange of such Offered Shares, Pre-Funded Warrants or Warrant Shares. (See "*Sale or Other Taxable Disposition of Offered Shares, Pre-Funded Warrants and/or Warrant Shares*" below). However, we do not intend to maintain the calculations of our earnings and profits in accordance with U.S. federal income tax principles, and each U.S. Holder therefore should assume that any distribution by us with respect to Offered Shares, Pre-Funded Warrants or Warrant Shares will constitute ordinary dividend income. Dividends received on Offered Shares, Pre-Funded Warrants or Warrant Shares by corporate U.S. Holders generally will not be eligible for the "dividends received deduction" generally applicable to corporations. Subject to applicable limitations and provided we are eligible for the benefits of the Canada-U.S. Tax Treaty or the Offered Shares are readily tradable on a United States securities market, dividends paid by us to non-corporate U.S. Holders, including individuals, in respect of Offered Shares, Pre-Funded Warrants or Warrant Shares generally will be eligible for the preferential tax rates applicable to long-term capital gains for dividends, provided certain holding period and other conditions are satisfied, including that we not be classified as a PFIC in the tax year of distribution or in the preceding tax year. The dividend rules are complex, and each U.S. Holder should consult its own tax advisors regarding the application of such rules.

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Sale or Other Taxable Disposition of Offered Shares, Pre-Funded Warrants and/or Warrant Shares

Upon the sale or other taxable disposition of Offered Shares, Pre-Funded Warrants or Warrant Shares, a U.S. Holder generally will recognize capital gain or loss in an amount equal to the difference between the U.S. dollar value of cash received plus the fair market value of any property received and such U.S. Holder's tax basis in such Offered Shares, Pre-Funded Warrants or Warrant Shares sold or otherwise disposed of. Gain or loss recognized on such sale or other taxable disposition generally will be long-term capital gain or loss if, at the time of the sale or other taxable disposition, the Offered Shares, Pre-Funded Warrants or Warrant Shares have been held for more than one year.

Preferential tax rates may apply to long-term capital gain of a U.S. Holder that is an individual, estate, or trust. There are currently no preferential tax rates for long-term capital gain of a U.S. Holder that is a corporation. Deductions for capital losses are subject to significant limitations under the Code.

Additional Considerations

Receipt of Foreign Currency

The amount of any distribution paid to a U.S. Holder in foreign currency, or on the sale, exchange or other taxable disposition of Offered Shares, Pre-Funded Warrants, Warrants or Warrant Shares generally will be equal to the U.S. dollar value of such foreign currency based on the exchange rate applicable on the date of receipt (regardless of whether such foreign currency is converted into U.S. dollars at that time). A U.S. Holder will have a tax basis in the foreign currency equal to its U.S. dollar value on the date of receipt. Any U.S. Holder who converts or otherwise disposes of the foreign currency after the date of receipt may have a foreign currency exchange gain or loss that would be treated as ordinary income or loss, and generally will be U.S. source income or loss for foreign tax credit purposes. Different rules apply to U.S. Holders who use the accrual method of tax accounting. Each U.S. Holder should consult its own U.S. tax advisors regarding the U.S. federal income tax consequences of receiving, owning, and disposing of foreign currency.

Foreign Tax Credit

Dividends paid on the Offered Shares, Pre-Funded Warrants, or Warrant Shares (or constructive dividends on the Warrants) will be treated as foreign-source income, and generally will be treated as "passive category income" or "general category income" for U.S. foreign tax credit purposes. Any gain or loss recognized on a sale or other disposition of Offered Shares, Pre-Funded Warrants, Warrants or Warrant Shares generally will be United States source gain or loss. Certain U.S. Holders that are eligible for the benefits of Canada-U.S. Tax Treaty may elect to treat such gain or loss as Canadian source gain or loss for U.S. foreign tax credit purposes. The Code applies various complex limitations on the amount of foreign taxes that may be claimed as a credit by U.S. taxpayers. In addition, Treasury Regulations that apply to foreign taxes paid or accrued (the "Foreign Tax Credit Regulations") impose additional requirements for Canadian withholding taxes to be eligible for a foreign tax credit, and there can be no assurance that those requirements will be satisfied. The Treasury Department has recently released guidance temporarily pausing the application of certain of the Foreign Tax Credit Regulations.

Subject to the PFIC rules and the Foreign Tax Credit Regulations, each as discussed above, a U.S. Holder that pays (whether directly or through withholding) Canadian income tax with respect to dividends paid on the Offered Shares, Pre-Funded Warrants or Warrant Shares (or constructive dividends on the Warrants) generally will be entitled, at the election of such U.S. Holder, to receive either a deduction or a credit for such Canadian income tax. Generally, a credit will reduce a U.S. Holder's U.S. federal income tax liability on a dollar-for-dollar basis, whereas a deduction will reduce a U.S. Holder's income that is subject to U.S. federal income tax. This election is made on a year-by-year basis and applies to all foreign taxes paid (whether directly or through withholding) by a U.S. Holder during a year. The foreign tax credit rules are complex and involve the application of rules that depend on a U.S. Holder's particular circumstances. Accordingly, each U.S. Holder should consult its own U.S. tax advisor regarding the foreign tax credit rules.

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Backup Withholding and Information Reporting

Under U.S. federal income tax law and Treasury Regulations, certain categories of U.S. Holders must file information returns with respect to their investment in, or involvement in, a foreign corporation. For example, U.S. return disclosure obligations (and related penalties) are imposed on individuals who are U.S. Holders that hold certain specified foreign financial assets in excess of certain threshold amounts. The definition of specified foreign financial assets includes not only financial accounts maintained in foreign financial institutions, but also, unless held in accounts maintained by a financial institution, any stock or security issued by a non-U.S. person, any financial instrument or contract held for investment that has an issuer or counterparty other than a U.S. person and any interest in a non-U.S. entity. U.S. Holders may be subject to these reporting requirements unless their Offered Shares, Pre-Funded Warrants, Warrants or Warrant Shares are held in an account at certain financial institutions. Penalties for failure to file certain of these information returns are substantial. U.S. Holders should consult their own tax advisors regarding the requirements of filing information returns, including the requirement to file an IRS Form 8938.

Payments made within the U.S. or by a U.S. payor or U.S. middleman, of dividends on, and proceeds arising from the sale or other taxable disposition of Offered Shares, Pre-Funded Warrants, Warrants or Warrant Shares will generally be subject to information reporting and backup withholding tax (currently at a rate of 24%) if a U.S. Holder (a) fails to furnish such U.S. Holder's correct U.S. taxpayer identification number (generally on IRS Form W-9), (b) furnishes an incorrect U.S. taxpayer identification number, (c) is notified by the IRS that such U.S. Holder has previously failed to properly report items subject to backup withholding tax, or (d) fails to certify, under penalty of perjury, that such U.S. Holder has furnished its correct U.S. taxpayer identification number and that the IRS has not notified such U.S. Holder that it is subject to backup withholding tax. However, certain exempt persons generally are excluded from these information reporting and backup withholding rules. Backup withholding is not an additional tax. Any amounts withheld under the U.S. backup withholding tax rules will be allowed as a credit against a U.S. Holder's U.S. federal income tax liability, if any, or will be refunded, if such U.S. Holder furnishes required information to the IRS in a timely manner.

The discussion of reporting requirements set forth above is not intended to constitute a complete description of all reporting requirements that may apply to a U.S. Holder. A failure to satisfy certain reporting requirements may result in an extension of the time period during which the IRS can assess a tax, and under certain circumstances, such an extension may apply to assessments of amounts unrelated to any unsatisfied reporting requirement. Each U.S. Holder should consult its own tax advisors regarding the information reporting and backup withholding rules.

THE ABOVE SUMMARY IS NOT INTENDED TO CONSTITUTE A COMPLETE ANALYSIS OF ALL TAX CONSIDERATIONS APPLICABLE TO U.S. HOLDERS WITH RESPECT TO THE ACQUISITION, OWNERSHIP AND DISPOSITION OF OFFERED SHARE UNITS, PRE-FUNDED UNITS, OFFERED SHARES, PRE-FUNDED WARRANTS, WARRANTS, AND WARRANT SHARES. U.S. HOLDERS SHOULD CONSULT THEIR OWN TAX ADVISORS AS TO THE TAX CONSIDERATIONS APPLICABLE TO THEM IN LIGHT OF THEIR OWN PARTICULAR CIRCUMSTANCES.

DESCRIPTION OF OUR COMMON SHARES

The following description of the common shares summarizes the material terms and provisions thereof.

Authorized Capital

Our authorized share capital consists of an unlimited number of common shares, no par value, of which 7,942,363 were issued and outstanding as at December 26, 2023. None of our common shares are held by us or on our behalf.

Common Shares

The holders of our common shares are entitled to receive notice of and to attend and vote at all annual and special meetings of our shareholders. Our common shares carry one vote per common share and do not have cumulative voting rights. The holders of our common shares are entitled, at the discretion of our board of directors, to receive out of any or all of our profits or surplus properly available for the payment of dividends, any dividend declared by the board of directors and payable by us on our common shares. The holders of our common shares will participate on a pro rata basis in any distribution of our remaining property upon our liquidation, dissolution or winding-up or any other return of capital or distribution of our assets among our shareholders for the purpose of winding up our affairs.

Dividend Policy

We have not paid any dividends since our incorporation. At the discretion of our board of directors, we will consider paying dividends in the future as our operational circumstances may permit, having regard to, among other things, our earnings, cash flow and financial requirements. It is the current policy of our board of directors to retain all earnings to finance our business plan.

Listings

Our common shares are listed on Nasdaq under the symbol "APTO" and on the TSX under the symbol "APS".

DESCRIPTION OF OUR SECURITIES WE ARE OFFERING

We are offering 2,164,502 Offered Shares, together with Warrants to purchase up to 2,164,502 Offered Shares. Each Warrant has an assumed exercise price of \$2.31 per Offered Share, which is the last reported sale price of our common shares on Nasdaq on December 26, 2023. The Offered Shares and the Warrants are immediately separable and will be issued separately, but must be purchased together in this offering. We are also offering Pre-Funded Warrants to purchase up to 2,164,502 Offered Shares to those purchasers whose purchase of Offered Shares in this offering would result in the purchaser beneficially owning more than 4.99% (or, at the election of the purchaser, 9.99%) of our outstanding common shares following the consummation of this offering in lieu of the Offered Shares that would result in ownership in excess of 4.99% (or, at the election of the purchaser, 9.99%). Each Pre-Funded Warrant will be exercisable for one Offered Share at an exercise price of \$0.01 per Offered Share. Each Pre-Funded Warrant is being issued together with the same Warrants described above being issued with each Offered Share. The Pre-Funded Warrants and Warrants are immediately separable and will be issued separately in this offering, but must be purchased together in this offering. For each Pre-Funded Warrant and accompanying Warrant we sell, the number of Offered Shares and accompanying Warrants we are offering will be decreased on a one-for-one basis.

Offered Shares

The material terms and provisions of our common shares are described under the section titled “Description of our Common Shares” on page 33.

Pre-Funded Warrants

The following summary of certain terms and provisions of the Pre-Funded Warrants that are being issued hereby is not complete and is subject to, and qualified in its entirety by, the provisions of the Pre-Funded Warrant, the form of which is filed as an exhibit to the registration statement of which this prospectus forms a part. Prospective investors should carefully review the terms and provisions of the form of Pre-Funded Warrant for a complete description of the terms and conditions of the Pre-Funded Warrants.

Duration and Exercise Price

Each Pre-Funded Warrant offered hereby will have an initial exercise price per Offered Share equal to \$0.01. Each Pre-Funded Warrant will be exercisable immediately upon issuance until the Pre-Funded Warrant is exercised in full. We may at any time during the term of each Pre-Funded Warrant reduce the then current exercise price to any amount and for any period of time deemed appropriate by our board of directors. The exercise price and number of Offered Shares issuable upon exercise is subject to appropriate adjustment in the event of stock splits and combinations affecting our Offered Shares. The Pre-Funded Warrants and Warrants are immediately separable and will be issued separately but must be purchased together in this offering.

Exercisability

The Pre-Funded Warrants will be exercisable, at the option of each holder, in whole or in part, by delivering to us a duly executed exercise notice accompanied by payment in full for the number of Offered Shares purchased upon such exercise (except in the case of a cashless exercise as discussed below). A holder (together with its affiliates) may not exercise any portion of the Pre-Funded Warrant to the extent that the holder would beneficially own (as determined in accordance with the terms of the Pre-Funded Warrants and the rules and regulations of the SEC) more than 4.99% (or, at the election of the purchaser, 9.99%) of the outstanding Offered Shares immediately after exercise, or the maximum percentage, except that upon at least 61 days' prior notice from the holder to us, the holder may increase or decrease the maximum percentage, provided that the maximum percentage cannot be increased to more than 9.99% and any increase does not take effect for 61 days after such notice is delivered.

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Cashless Exercise

In lieu of making the cash payment otherwise contemplated to be made to us upon such exercise in payment of the aggregate exercise price, the holder may elect instead to receive upon such exercise (either in whole or in part) the net number of Offered Shares determined according to a formula set forth in the Pre-Funded Warrants.

Transferability

Subject to applicable laws, a Pre-Funded Warrant may be transferred at the option of the holder upon surrender of the Pre-Funded Warrant to us together with the appropriate instruments of transfer.

Fractional Shares

No fractional Offered Shares will be issued upon the exercise of the Pre-Funded Warrants. Rather, the number of Offered Shares to be issued will be rounded to the nearest whole number.

Trading Market

There is no trading market available for the Pre-Funded Warrants on any securities exchange or nationally recognized trading system, and we do not expect a trading market to develop. We do not intend to list the Pre-Funded Warrants on any securities exchange or other trading market. Without a trading market, the liquidity of the Pre-Funded Warrants will be extremely limited. The Offered Shares issuable upon exercise of the Pre-Funded Warrants are currently listed on Nasdaq. We have applied to list the Offered Shares issuable upon exercise of the Pre-Funded Warrants on the TSX.

Right as a Shareholder

Except as otherwise provided in the Pre-Funded Warrants or by virtue of such holder's ownership of Offered Shares, the holders of the Pre-Funded Warrants do not have the rights or privileges of holders of our common shares, including any voting rights, until they exercise their Pre-Funded Warrants. The Pre-Funded Warrants provide that holders have the right to participate in distributions or dividends paid on our Offered Shares.

Fundamental Transaction

In the event we are subject to a Fundamental Transaction (as such term is defined in the form of Pre-Funded Warrant), then we will not enter into or be a party to the Fundamental Transaction unless the successor entity assumes in writing all of the obligations of the Company under the Pre-Funded Warrant. If the Fundamental Transaction is a Change of Control (as such term is defined in the form of Pre-Funded Warrant), at the request of the holder delivered no later than 30 days after the closing of such Change of Control, we or the successor entity shall purchase the Pre-Funded Warrant for an amount equal to the Black Scholes Value (as defined in the Pre-Funded Warrant) of the unexercised portion of the Pre-Funded Warrant on the effective date of the Change of Control. Such purchase shall be payable in cash unless the Change of Control is not within our control, including not having been approved by our board of directors, in which case the holder shall be entitled to receive the same type or form of consideration (and in the same proportion) at the Black Scholes Value of the unexercised portion of the Pre-Funded Warrant, that is being offered and paid to the holders of Offered Shares.

Warrants to Purchase Offered Shares

The following summary of certain terms and provisions of the Warrants is not complete and is subject to, and qualified in its entirety by, the provisions of the Warrants, the form of which is filed as an exhibit to the registration statement of which this prospectus forms a part. Prospective investors should carefully review the terms and provisions of the form of Warrant for a complete description of the terms and conditions of the Warrants.

Duration and Exercise Price

Each Warrant offered hereby has an assumed initial exercise price equal to \$2.31 per Offered Share, which is the last reported sale price of our common shares on Nasdaq on December 26, 2023. The Warrants will be exercisable immediately upon issuance and will expire five years from the date of issuance. We may at any time during the term of each Warrant reduce the then current exercise price to any amount and for any period of time deemed appropriate by our board of directors. The exercise price and number of Offered Shares issuable upon exercise is subject to appropriate adjustment in the event of stock splits and combinations affecting our Offered Shares. The Warrants will be issued separately from the Offered Shares, or the Pre-Funded Warrants, as the case may be.

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Exercisability

The Warrants will be exercisable, at the option of each holder, in whole or in part, by delivering to us a duly executed exercise notice accompanied by payment in full for the number of Offered Shares purchased upon such exercise (except in the case of a cashless exercise as discussed below). A holder (together with its affiliates) may not exercise any portion of the Warrant to the extent that the holder would beneficially own more than the maximum percentage, except that upon prior notice from the holder to us, the holder may increase or decrease the maximum percentage, provided that the maximum percentage cannot be increased to more than 9.99% and any increase does not take effect for 61 days after such notice is delivered.

Cashless Exercise

If, at the time a holder exercises its Warrants, a registration statement registering the issuance of the Offered Shares underlying the Warrants or the resale of such shares under the Securities Act is not then effective or available for the issuance or resale, as applicable, of such shares, then in lieu of making the cash payment otherwise contemplated to be made to us upon such exercise in payment of the aggregate exercise price, the holder may elect instead to receive upon such exercise (either in whole or in part) the net number of Offered Shares determined according to a formula set forth in the Warrants.

Fractional Shares

No fractional Offered Shares will be issued upon the exercise of the Warrants. Rather, the number of Offered Shares to be issued will be rounded to the nearest whole number.

Transferability

Subject to applicable laws, a Warrant may be transferred at the option of the holder upon surrender of the Warrant to us together with the appropriate instruments of transfer.

Trading Market

There is no trading market available for the Warrants on any securities exchange or nationally recognized trading system, and we do not expect a trading market to develop. We do not intend to list the Warrants on any securities exchange or other trading market. Without a trading market, the liquidity of the Warrants will be extremely limited. Our common shares are currently listed on Nasdaq. We have applied to list the Offered Shares issuable upon exercise of the Warrants on the TSX.

Right as a Shareholder

Except as otherwise provided in the Warrants or by virtue of such holder's ownership of Offered Shares, the holders of the Warrants do not have the rights or privileges of holders of our Offered Shares, including any voting rights, until they exercise their Warrants.

Fundamental Transaction

In the event we are subject to a Fundamental Transaction (as such term is defined in the form of Warrant), then we will not enter into or be a party to the Fundamental Transaction unless the successor entity assumes in writing all of the obligations of the Company under the Warrant. If the Fundamental Transaction is a Change of Control (as such term is defined in the form of Warrant), at the request of the holder delivered no later than 30 days after the closing of such Change of Control, we or the successor entity shall purchase the Warrant for an amount equal to the Black Scholes Value (as defined in the Warrant) of the unexercised portion of the Warrant on the effective date of the Change of Control. Such purchase shall be payable in cash unless the Change of Control is not within our control, including not having been approved by our board of directors, in which case the holder shall be entitled to receive the same type or form of consideration (and in the same proportion) at the Black Scholes Value of the unexercised portion of the Warrant, that is being offered and paid to the holders of Offered Shares.

Table of Contents*U.S. Tax Consequences*

In the event of an adjustment (or nonoccurrence of an adjustment) to the exercise price or the number of Offered Shares or other consideration for which a Warrant or Pre-Funded Warrant may be exercised, the holders of the Warrants or Pre-Funded Warrants may, in certain circumstances, be deemed to have received a distribution subject to U.S. federal income tax as a dividend. See “Material U.S. Federal Income Tax Consequences.” Because this deemed income would not give rise to any cash from which any applicable withholding tax could be satisfied, if withholding taxes (including backup withholding taxes) are paid on behalf of a holder, those withholding taxes may be set off against any cash or shares received pursuant to the Warrants or Pre-Funded Warrants (or, in some circumstances, against any payments on the Offered Shares).

**DISCLOSURE OF COMMISSION POSITION ON INDEMNIFICATION FOR SECURITIES ACT
LIABILITIES**

Insofar as indemnification for liabilities arising under the Securities Act may be permitted to our directors, officers and controlling persons pursuant to the foregoing provisions, we have been informed that in the opinion of the SEC such indemnification is against public policy as expressed in the Securities Act and is, therefore, unenforceable.

LEGAL MATTERS

The validity of the securities being offered hereby is being passed upon for us by McCarthy Tétrault LLP, Toronto, Ontario, with respect to matters of Canadian law and Dorsey & Whitney LLP, Vancouver, British Columbia and Denver, Colorado with respect to matters of U.S. law. Certain legal matters will be passed upon for the underwriter by Mintz, Levin, Cohn, Ferris, Glovsky and Popeo, P.C.

EXPERTS

The consolidated financial statements of Aptose Biosciences Inc. as of December 31, 2022 and 2021, and for each of the years then ended, have been incorporated by reference from our Annual Report on Form 10-K as filed with the SEC on March 24, 2023, in reliance upon the report of KPMG LLP, an independent registered public accounting firm. Such report is incorporated by reference upon the authority of said firm as experts in accounting and auditing. The audit report covering the December 31, 2022 consolidated financial statements contains an explanatory paragraph that states that the Company's recurring losses from operations and net capital deficiency raise substantial doubt about the entity's ability to continue as a going concern. The consolidated financial statements do not include any adjustments that might result from the outcome of that uncertainty.

WHERE YOU CAN FIND MORE INFORMATION

We are subject to the information requirements of the Securities Exchange Act of 1934 and, accordingly, we file reports with and furnish other information to the SEC. This prospectus forms part of a registration statement we have filed with the SEC relating to, among other things, the Offered Shares. As permitted by SEC rules, this prospectus does not contain all of the information contained in the registration statement that we filed. For further information regarding us and the securities covered by this prospectus, you may desire to review the full registration statement, including its exhibits. The registration statement, including its exhibits, as well as the documents that we file with the SEC, may be inspected and copied at the public reference facilities maintained by the SEC at 100 F Street, N.E., Room 1580, Washington, D.C. 20549. You may obtain information on the operation of the public reference room by calling 1-800-SEC-0330. Copies of such materials are also available by mail from the Public Reference Branch of the SEC at 100 F Street, N.E., Washington, D.C. 20549 at prescribed rates. In addition, the SEC maintains a website (<http://www.sec.gov>) from which interested persons can electronically access the registration statement, including the exhibits to the registration statement.

INCORPORATION OF CERTAIN INFORMATION BY REFERENCE

The SEC allows us to "incorporate by reference" information we file with the SEC. This means that we can disclose important information to you by referring you to those documents.

We incorporate by reference into this prospectus the documents listed below:

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- Annual Report on [Form 10-K](#) for the fiscal year ended December 31, 2022 filed with the SEC on March 24, 2023;
- Quarterly Reports on Form 10-Q filed with the SEC on [May 8, 2023](#), [August 10, 2023](#) and [November 9, 2023](#);
- Our definitive proxy statement on [Schedule 14A](#) filed on April 19, 2023;
- Our Current Reports on Form 8-K filed with the SEC on [January 6, 2023](#), [May 23, 2023](#), [May 26, 2023](#), [June 5, 2023](#), [June 12, 2023](#), [June 26, 2023](#) and [September 12, 2023](#) (other than current reports furnished under Item 2.02 or Item 7.01 of Form 8-K and exhibits that are related to such item); and

The description of our common shares set forth under the heading “Additional Information - Common Shares” contained in our Annual Report on Form 20-F for the fiscal year end May 31, 2014, filed with the SEC on [July 30, 2014](#), and incorporated by reference into our Registration Statement on Form 8-A, as filed with the SEC on [October 21, 2014](#), including any amendment or report to such Registration Statement on Form 8-A filed for the purpose of amending such description.

In addition, all documents filed by us under Sections 13(a), 13(c), 14 or 15(d) of the Securities Exchange Act of 1934, after the date of this prospectus but before the termination of the offering of the securities covered by this prospectus, are hereby incorporated by reference into this prospectus.

We have not authorized anyone to provide you with any different or additional information other than that contained in or incorporated by reference into this prospectus. We take no responsibility for, and can provide no assurance as to the reliability of, any information that others may provide.

Any statement contained in a document incorporated or deemed to be incorporated by reference into this prospectus will be deemed to be modified or superseded for purposes of this prospectus to the extent that a statement contained in this prospectus or any other subsequently filed document that is deemed to be incorporated by reference into this prospectus modifies or supersedes the statement. Any statement so modified or superseded will not be deemed, except as so modified or superseded, to constitute a part of this prospectus.

The documents incorporated by reference into this prospectus are available from us upon request. We will provide a copy of any and all of the information that is incorporated by reference into this prospectus to any person, including a beneficial owner, to whom a prospectus is delivered, without charge, upon written or oral request. If exhibits to the documents incorporated by reference into this prospectus are not themselves specifically incorporated by reference in this prospectus, then the exhibits will not be provided.

Requests for any of these documents should be directed to:

Investor Relations
Aptose Biosciences Inc.
251 Consumers Road, Suite 1105
Toronto, Ontario, Canada M2J 4R3
(647) 479-9828

2,164,502 Common Shares

2,164,502 Pre-Funded Warrants to Purchase up to 2,164,502 Common Shares

2,164,502 Warrants to Purchase 2,164,502 Common Shares

Up to 2,164,502 Common Shares Underlying Pre-Funded Warrants

Up to 2,164,502 Common Shares Underlying Warrants

Up to 151,515 Common Shares Underlying Underwriter's Warrants



PROSPECTUS

Sole Book-Running Manager

Newbridge Securities Corporation

, 2024

PART II
INFORMATION NOT REQUIRED IN THE PROSPECTUS

Item 13. Other Expenses of Issuance and Distribution.

The following table sets forth all expenses to be paid by the Company, other than underwriting discounts and commissions, upon the completion of this offering. All amounts shown are estimates except for the SEC filing fee.

	Approximate Amount
SEC registration fee	\$ 2,952
Legal fees and expenses	280,000
Accounting fees and expenses	55,000
Transfer agent and registrar fees	12,048
Total	<u>\$ 350,000</u>

Item 14. Indemnification of Directors and Officers.

Under the *Canada Business Corporations Act* or the “CBCA”, the Company may indemnify its current or former directors or officers or another individual who acts or acted at the Company’s request as a director or officer, or an individual acting in a similar capacity, of another entity, against all costs, charges and expenses, including an amount paid to settle an action or satisfy a judgment, reasonably incurred by the individual in respect of any civil, criminal, administrative, investigative or other proceeding in which the individual is involved because of his or her association with the Company or another entity, and the individual seeking indemnity shall have a right to such indemnity if such individual was not judged by the court or other competent authority to have committed any fault or omitted to do anything that such individual ought to have done. The CBCA also provides that the Company may advance moneys to such an individual for the costs, charges and expenses of such a proceeding.

The CBCA also provides that the Company may with the approval of a court, indemnify such an individual or advance moneys against all costs, charges and expenses reasonably incurred by the individual in connection with an action by or on behalf of the Company or other entity to procure a judgment in its favour, to which the individual is made a party because of the individual’s association with the Company or other entity at the Company’s request.

However, indemnification under any of the foregoing circumstances is prohibited under the CBCA unless the individual:

- acted honestly and in good faith with a view to the Company’s best interests, or the best interests of the other entity for which the individual acted as director or officer or in a similar capacity at the Company’s request; and
- in the case of a criminal or administrative action or proceeding that is enforced by a monetary penalty, the individual had reasonable grounds for believing that his or her conduct was lawful.

The Company’s by-law No. 2 provides that the Company will indemnify its directors or officers, former directors or officers or other individuals who act or have acted at the Company’s request as a director or officer, or in a similar capacity, of another entity, and his or her heirs and legal representatives to the extent permitted by the CBCA.

The Company’s by-law No. 2 further provides that, except as otherwise required by the CBCA, the Company may from time to time indemnify and save harmless any person who was or is a party or is threatened to be made a party to any threatened, pending or completed action, suit or proceeding, whether civil, criminal, administrative or investigative (other than an action by or in the right of the Company) by reason of the fact that he or she is or was an employee or agent of the Company, or is or was serving at the request of the Company as an employee, agent of or participant in another entity against expenses (including legal fees), judgments, fines and any amount actually and

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reasonably incurred by him or her in connection with such action, suit or proceeding if he or she acted honestly and in good faith with a view to the best interests of the Company or, as the case may be, to the best interests of the other entity for which he or she served at the Company's request and, with respect to any criminal or administrative action or proceeding that is enforced by a monetary penalty, had reasonable grounds for believing that his or her conduct was lawful. The termination of any action, suit or proceeding by judgment, order, settlement or conviction will not, of itself, create a presumption that the person did not act honestly and in good faith with a view to the best interests of the Company or other entity and, with respect to any criminal or administrative action or proceeding that is enforced by a monetary penalty, had no reasonable grounds for believing that his or her conduct was lawful.

The Company has entered into indemnity agreements with its directors and certain officers pursuant to which it has agreed to indemnify its officers and directors for:

- (a) all costs, charges and expenses, including an amount paid to settle an action or satisfy a judgment, reasonably incurred by them in respect of any civil, criminal or administrative action or proceeding to which they are made a party by reason of being or having been a director and/or officer of the Company, if (i) they acted honestly and in good faith with a view to the best interests of the Company, and (ii) in the case of a criminal or administrative action or proceeding that is enforced by a monetary penalty, they had reasonable grounds for believing that their conduct was lawful.
- (b) all costs, charges and expenses reasonably incurred by them in connection with any action by or on behalf of the Company to procure a judgment in the Company's favour to which they are made a party by reason of being or having been a director and/or officer of the Company.
- (c) all costs, charges and expenses reasonably incurred by them in connection with the defense of any civil, criminal or administrative proceeding to which they are made a party by reason of being or having been a director and/or officer of the Company if they have been substantially successful on the merits in their defense of the action or proceeding and they fulfil the conditions set forth in the two foregoing clauses (a)(i) and (a)(ii) above.

Insofar as indemnification for liabilities arising under the Securities Act of 1933 may be permitted to directors, officers or persons controlling the Company pursuant to the foregoing provisions, the Company has been informed that in the opinion of the Securities and Exchange Commission such indemnification is against public policy as expressed in the Securities Act of 1933 and is therefore unenforceable.

Item 15. Recent Sales of Unregistered Securities.

The Company sold the securities described below within the past three years which were not registered under the Securities Act.

On May 25, 2023, the Company entered into Purchase Agreement with Keystone Capital Partners, LLC ("Keystone"), pursuant to which Keystone has committed to purchase from the Company, at the Company's direction, up to \$25 million common shares, subject to the terms and conditions specified in such purchase agreement. Pursuant to the Purchase Agreement, the Company issued to Keystone 7,547 Initial Commitment Shares concurrently with the Company's execution of the Purchase Agreement as consideration for its irrevocable commitment to purchase the common shares thereunder, subject the terms and conditions contained therein. In the nine months ended September 30, 2023, the Company's issuance of common shares to Keystone comprised 328,438 common shares. The securities were issued pursuant to an exemption from registration provided for under Section 4(a)(2) of the Securities Act. The Company relied on this exemption from registration based in part on representations made by the investor.

On September 6, 2023, the Company entered into a subscription agreement (the "Subscription Agreement") with Hanmi Pharmaceutical Co., Ltd., a corporation formed under the laws of the Republic of Korea ("Hanmi Pharmaceutical"), pursuant to which the Company agreed to sell and issue to Hanmi Pharmaceutical and Hanmi Pharmaceutical agreed to purchase from the Company up to \$7.0 million of our common shares, at a purchase price per common share of \$4.448 (the "Purchase Price"), which represents a premium to the Nasdaq "Minimum Price" as defined under Rule 5635(d)(1)(A) under Nasdaq's Listing Rules of \$4.04 per common share for aggregate gross

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proceeds to the Company of up to \$7.0 million (such transaction, the “Hanmi Investment”). Hanmi Pharmaceutical is a current shareholder of the Company and holds, as of the date of this current report, approximately 884,152 common shares which represents approximately 11.13% of the Company’s issued and outstanding common shares on a non-diluted basis. The Hanmi Investment was structured in two tranches. The first tranche of \$3.0 million was paid upon the signing of the Subscription Agreement for the issuance of 668,449 common shares at the Purchase Price. The second tranche of \$4.0 million (the “Second Tranche”) will be priced at a premium to the Nasdaq “Minimum Price” based on a formula set forth in the Subscription Agreement and will be paid upon the Company achieving certain milestones. The securities were issued pursuant to an exemption from registration provided for under Section 4(a)(2) of the Securities Act. The Company relied on this exemption from registration based in part on representations made by the investor.

Item 16. Exhibits and Financial Statement Schedules.

(a) See the Exhibit Index on the page immediately preceding the signature page hereto for a list of exhibits filed as part of this registration statement on Form S-1, which Exhibit Index is incorporated herein by reference.

(b) No financial statement schedules are provided because the information called for is not required or is shown either in the financial statements or the notes thereto.

Item 17. Undertakings.

The undersigned registrant hereby undertakes:

(1) To file, during any period in which offers or sales are being made, a post-effective amendment to this registration statement:

(i) To include any prospectus required by section 10(a)(3) of the Securities Act;

(ii) To reflect in the prospectus any facts or events arising after the effective date of the registration statement (or the most recent post-effective amendment thereof) which, individually or in the aggregate, represent a fundamental change in the information set forth in the registration statement. Notwithstanding the foregoing, any increase or decrease in volume of securities offered (if the total dollar value of securities offered would not exceed that which was registered) and any deviation from the low or high end of the estimated maximum offering range may be reflected in the form of prospectus filed with the Securities and Exchange Commission pursuant to Rule 424(b) if, in the aggregate, the changes in volume and price represent no more than a 20 percent change in the maximum aggregate offering price set forth in the “Calculation of Registration Fee” table in the effective registration statement; and

(iii) To include any material information with respect to the plan of distribution not previously disclosed in the registration statement or any material change to such information in the registration statement.; provided, however, that paragraphs (1)(i), (1)(ii) and (1)(iii) above do not apply if the information required to be included in a post-effective amendment by those paragraphs is contained in reports filed with or furnished to the Securities and Exchange Commission by the Company pursuant to Section 13 or Section 15(d) of the Securities Exchange Act of 1934 that are incorporated by reference in the registration statement, or is contained in a form of prospectus filed pursuant to Rule 424(b) that is part of the registration statement.

(2) That, for the purpose of determining any liability under the Securities Act, each such post-effective amendment shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial bona fide offering thereof.

(3) To remove from registration by means of a post-effective amendment any of the securities being registered which remain unsold at the termination of the offering.

(4) That, for the purpose of determining liability under the Securities Act to any purchaser:

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(A) Each prospectus filed by the Company pursuant to Rule 424(b)(3) shall be deemed to be part of the registration statement as of the date the filed prospectus was deemed part of and included in the registration statement; and

(B) Each prospectus required to be filed pursuant to Rule 424(b)(2), (b)(5) or (b)(7) as part of a registration statement in reliance on Rule 430B relating to an offering made pursuant to Rule 415(a)(1)(i), (vii), or (x) for the purpose of providing the information required by Section 10(a) of the Securities Act shall be deemed to be part of and included in the registration statement as of the earlier of the date such form of prospectus is first used after effectiveness or the date of the first contract of sale of securities in the offering described in the prospectus. As provided in Rule 430B, for liability purposes of the issuer and any person that is at that date an underwriter, such date shall be deemed to be a new effective date of the registration statement relating to the securities in the registration statement to which that prospectus relates, and the offering of such securities at that time shall be deemed to be the initial bona fide offering thereof. *Provided, however*, that no statement made in a registration statement or prospectus that is part of the registration statement or made in a document incorporated or deemed incorporated by reference into the registration statement or prospectus that is part of the registration statement will, as to a purchaser with a time of contract of sale prior to such effective date, supersede or modify any statement that was made in the registration statement or prospectus that was part of the registration statement or made in any such document immediately prior to such effective date.

(5) That, for purposes of determining any liability under the Securities Act, each filing of the Company's annual report pursuant to Section 13(a) or 15(d) of the Exchange Act (and, where applicable, each filing of an employee benefit plan's annual report pursuant to Section 15(d) of the Exchange Act) that is incorporated by reference in the registration statement shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial bona fide offering thereof.

(6) Insofar as indemnification for liabilities arising under the Securities Act may be permitted to directors, officers and controlling persons of the Company pursuant to any charter provision, by law or otherwise, the Company has been advised that in the opinion of the Securities and Exchange Commission such indemnification is against public policy as expressed in the Securities Act and is, therefore, unenforceable. In the event that a claim for indemnification against such liabilities (other than payment by the Company of expenses incurred or paid by a director, officer or controlling person of the Company in the successful defense of any action, suit or proceeding) is asserted by such director, officer or controlling person in connection with the securities being registered, the Company will, unless in the opinion of its counsel the matter has been settled by controlling precedent, submit to a court of appropriate jurisdiction the question whether such indemnification by it is against public policy as expressed in the Securities Act and will be governed by the final adjudication of such issue.

EXHIBIT INDEX

The following documents are being filed with the Commission as exhibits to this registration statement on FormS-1.

Exhibit Number	Description of Document
1.1*	Form of Underwriting Agreement
3.1	Articles of Incorporation, Arrangement and Amendment (incorporated herein by reference to Exhibit 99.3 to the Company's Current Report on Form 6-K filed with the SEC on June 12, 2015)
3.2	Certificate of Amendment (incorporated herein by reference to Exhibit 3.1 to the Company's Current Report on Form8-K filed with the SEC on June 5, 2023)
3.3	By-law #2 of the Company (incorporated herein by reference to Exhibit 99.2 to the Company's Current Report on Form 6-K filed with the SEC on June 12, 2015)
4.1	Description of Securities (incorporated by reference to Exhibit 4.1 to the Company's Annual report on Form10-K filed with the SEC on March 22, 2022)
4.2**	Form of Warrant Offered in this Offering
4.3**	Form of Pre-Funded Warrant Offered in this Offering
4.4*	Form of Underwriter's Warrant
5.1**	Opinion of McCarthy Tétrault LLP
5.2*	Opinion of Dorsey & Whitney LLP related to the Warrants and Pre-Funded Warrants
10.1	Indemnification Agreement dated July 10, 2007 between Lorus Therapeutics Inc. and the Company (incorporated herein by reference to Exhibit 99.10 to the Company's Current Report on Form 6-K filed with the SEC on September 4, 2007)
10.2+	Amended and Restated Executive Employment Agreement between the Company and Dr. William G. Rice dated August 19, 2014 (incorporated herein by reference to Exhibit 4.9A to the Company's Annual Report on Form 20-F filed with the SEC on March 4, 2015)
10.3+	Share Option Plan as amended May 5, 2015 (incorporated herein by reference to Exhibit 99.2 to the Company's Current Report on Form6-K filed with the SEC on June 12, 2015)
10.4+	Stock Incentive Plan as adopted May 5, 2015 (incorporated herein by reference to Exhibit 99.1 to the Company's Current Report on Form 6-K filed with the SEC on June 12, 2015)
10.5+	Form of Executive Employment Agreement, dated December 4, 2019, between the Company and Dr. Rafael Bejar (incorporated herein by reference to Exhibit 10.7 to the Company's Annual Report filed on Form 10-K filed with the SEC on March 10, 2020)
10.6	License agreement dated June 13, 2018 by and between the Company and CrystalGenomics, Inc. (incorporated herein by reference to Exhibit 1.1 to the Company's Current Report on Form 6-K filed with the SEC filed on June 22, 2018)
10.7	Option and License Agreement between the Company and CrystalGenomics, Inc. dated March 21, 2016 (incorporated herein by reference on Form 10-KA/3 filed with the SEC on April 22, 2019)

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10.8	<u>Amendment to Option and License Agreement between the Company and CrystalGenomics, Inc., dated April 26, 2016 (incorporated herein by reference to Exhibit 99.2 to the Company's Current Report on Form 6-K filed with the SEC on June 8, 2016)</u>
10.9	<u>Second Amendment to Option and License Agreement between the Company and CrystalGenomics, Inc., dated May 13, 2016 (incorporated herein by reference to Exhibit 99.3 to the Company's Current Report on Form 6-K filed with the SEC on June 8, 2016)</u>
10.10	<u>Third Amendment to Option and License Agreement between the Company and CrystalGenomics, Inc., dated May 19, 2016 (incorporated herein by reference to Exhibit 99.4 to the Company's Current Report on Form 6-K filed with the SEC on June 8, 2016)</u>
10.11	<u>Fourth Amendment to Option and License Agreement between the Company and CrystalGenomics, Inc., dated June 1, 2016 (incorporated herein by reference to Exhibit 99.5 to the Company's Current Report on Form 6-K filed with the SEC on June 8, 2016)</u>
10.12	<u>License Agreement dated as of March 6, 2018 by and between the Company and Ohm Oncology Inc. (incorporated herein by reference to Exhibit 99.2 on Form 6-K filed with the SEC on March 8, 2018)</u>
10.13+	<u>Aptose Biosciences Inc. 2021 Employee Stock Purchase Plan (incorporated by reference to the Definitive Proxy statement on Schedule 14A filed with the SEC on April 1, 2021)</u>
10.14+	<u>Aptose Biosciences Inc. 2021 Employee Stock Incentive Plan (incorporated by reference to the Definitive Proxy statement on Schedule 14A filed with the SEC on April 1, 2021)</u>
10.15	<u>Exclusive License Agreement, dated November 4, 2021, by and between Hanmi Pharmaceutical Co. Ltd. and Aptose Biosciences Inc. (incorporated herein by reference to Exhibit 10.1 to the Company's Current Report filed on Form 8-K on November 4, 2021)</u>
10.16	<u>Employment Agreement dated June 3, 2019 between Aptose Biosciences Inc. and Philippe Ledru (incorporated herein by reference to Exhibit 10.1 to the Company's Current Report filed on Form 8-K on April 11, 2022)</u>
10.17	<u>Employment Agreement, dated June 27, 2022, between Aptose Biosciences Inc. and Fletcher Payne (incorporated herein by reference to Exhibit 10.1 to the Company's Current Report filed on Form 8-K on June 28, 2022)</u>
10.18	<u>Equity Distribution Agreement, dated December 9, 2022, among Aptose Biosciences Inc. and JonesTrading Institutional Services LLC (incorporated herein by reference to Exhibit 10.1 to the Company's Current Report filed on Form 8-K on December 12, 2022)</u>
21.1	<u>List of Subsidiaries (incorporated herein by reference to Exhibit 21.1 to the Company's Current Report filed on Form 10-K on March 24, 2023)</u>
23.1*	<u>Consent of Independent Registered Public Accounting Firm (KPMG)</u>
23.2**	<u>Consent of McCarthy Tétrault LLP (included in Exhibit 5.1)</u>
23.3*	<u>Consent of Dorsey & Whitney LLP (included in Exhibit 5.2)</u>
24.1**	<u>Powers of Attorney</u>
107*	<u>Filing Fees</u>

+ Indicates management contract or compensatory plan.

* Filed herewith.

** Previously filed

SIGNATURES

Pursuant to the requirements of the Securities Act of 1933, the Company certifies that it has reasonable grounds to believe that it meets all of the requirements for filing this on Form S-1 and has duly caused this Amendment No.1 to this Registration Statement on Form S-1 to be signed on its behalf by the undersigned, thereunto duly authorized, in the City of Toronto, Ontario, Canada on December 29, 2023.

Aptose Biosciences Inc.

By: /s/ Fletcher Payne

Fletcher Payne

Senior Vice President and Chief Financial Officer

Pursuant to the requirements of the Securities Act of 1933, this registration statement has been signed by the following persons in the capacities and on the dates indicated.

APTOSE BIOSCIENCES INC.

[●] Common Shares

[●] Pre-Funded Warrants

[●] Warrants

UNDERWRITING AGREEMENT

[●], 2024

Newbridge Securities Corporation
as Representative of the several
Underwriters named in Schedule I hereto
1200 North Federal Highway, Suite 400
Boca Raton, FL 33432

Ladies and Gentlemen:

Aptose Biosciences Inc., a company incorporated under the Canada Business Corporations Act (the “Company”), proposes, subject to the terms and conditions contained herein, to sell to you and the other underwriters (the “Underwriters”) named on Schedule I to this Underwriting Agreement (the “Agreement”), for whom you are acting as Representative (the “Representative”), an aggregate of (i) [●] shares (the “Firm Shares”) of the Company’s common shares, no par value per share (the “Common Shares”), (ii) pre-funded warrants to purchase up to [●] Common Shares at an exercise price of \$0.01 per share, in the form attached hereto as Exhibit A (the “Pre-Funded Warrants”), and (iii) warrants (the “Common Warrants”) to purchase up to [●] Common Shares, in the form attached hereto as Exhibit B (the “Firm Common Warrants,” and, together with the Pre-Funded Warrants and the Firm Shares, the “Firm Securities”). The respective amounts of the Firm Securities to be purchased by each of the several Underwriters are set forth opposite their names on Schedule I hereto.

In addition, the Company proposes to grant to the Underwriters an option to purchase up to an additional [] Common Shares (the “Option Shares” and, together with the Firm Shares, the “Shares”) and/or Common Warrants (the “Option Common Warrants,” and collectively with the Option Shares, the “Option Securities”) from the Company for the purpose of covering over-allotments in connection with the sale of the Firm Securities.

The Firm Common Warrants and the Option Common Warrants are collectively called the “Common Warrants.” The Firm Common Warrants, Pre-Funded Warrants and Option Common Warrants are collectively called the “Warrants.” The Common Shares issuable upon exercise of the Warrants are referred to herein as the “Warrant Shares.” The Shares, the Warrants and the Warrant Shares are collectively called the “Securities.”

The Firm Securities in the transaction will be sold as units, with each unit consisting of (i) one Firm Share or one Pre-Funded Warrant to purchase one Warrant Share and (ii) one Firm Common Warrant to purchase one Warrant Share. The Firm Shares and/or Pre-Funded Warrants and Firm Common Warrants will be issued separately but will be purchased together in this offering.

The Company has prepared and filed in conformity with the requirements of the Securities Act of 1933, as amended (the “Securities Act”), and the published rules and regulations thereunder (the “Rules”) adopted by the Securities and Exchange Commission (the “Commission”), a Registration Statement (as hereinafter defined) on Form S-1 (No. 333-), including a preliminary prospectus, and such amendments thereof as may have been required to the date of this Agreement. Copies of such Registration Statement (including all amendments thereof) and of the related Preliminary Prospectus (as hereinafter defined) have heretofore been delivered by the Company or are otherwise available to you. The term “Preliminary Prospectus”

means any preliminary prospectus included at any time as a part of the Registration Statement or filed with the Commission by the Company pursuant to Rule 424(a) of the Rules. The term "Registration Statement" as used in this Agreement means the initial registration statement (including all exhibits and financial schedules and all documents and information deemed to be part of the Registration Statement by incorporation by reference or otherwise), as amended at the time and on the date it becomes effective (the "Effective Date"), including the information (if any) contained in the form of final prospectus filed with the Commission pursuant to Rule 424(b) of the Rules and deemed to be part thereof at the time of effectiveness pursuant to Rule 430A of the Rules. If the Company has filed an abbreviated registration statement to register additional Securities pursuant to Rule 462(b) under the Rules (the "462(b) Registration Statement"), then any reference herein to the Registration Statement shall also be deemed to include such 462(b) Registration Statement. The term "Prospectus" as used in this Agreement means the prospectus in the form included in the Registration Statement at the time of effectiveness or, if Rule 430A of the Rules is relied on, the term Prospectus shall also include the final prospectus filed with the Commission pursuant to and within the time limits described in Rule 424(b) of the Rules.

The Company understands that the Underwriters propose to make a public offering of the Securities, as set forth in and pursuant to the Statutory Prospectus (as hereinafter defined) and the Prospectus, as soon after the Effective Date and the date of this Agreement as the Representative deems advisable. The Company hereby confirms that the Underwriters and dealers have been authorized to distribute or cause to be distributed each Preliminary Prospectus, and, if applicable, each Issuer Free Writing Prospectus (as hereinafter defined) and are authorized to distribute the Prospectus (as from time to time amended or supplemented if the Company furnishes amendments or supplements thereto to the Underwriters).

1. Sale, Purchase, Delivery and Payment for the Securities On the basis of the representations, warranties and agreements contained in, and subject to the terms and conditions of, this Agreement:

(a) The Company agrees to issue and sell to each of the Underwriters, and each of the Underwriters agrees, severally and not jointly, to purchase from the Company, the number of Firm Shares and/or Pre-Funded Warrants and Firm Common Warrants set forth opposite the name of such Underwriter on Schedule I to this Agreement. The combined purchase price for one Firm Share and one Firm Common Warrant shall be \$[●] (93% of the price offered to the public) (the "Firm Price"). The combined purchase price for one Pre-Funded Warrant and one Firm Common Warrant shall be \$[●] (93% of the price offered to the public, minus \$0.01).

(b) The Company hereby grants to the several Underwriters an option (the "Over-Allotment Option") to purchase, severally and not jointly, (i) up to an additional [] Common Shares (the "Option Shares") and/or (ii) additional Warrants to purchase up to [] Common Shares (the "Option Warrants," and together with the Option Shares, the "Option Securities"), for the purpose of covering over-allotments of such securities, if any. The purchase price to be paid per Option Share is \$[]¹. The purchase price to be paid per Option Warrant is \$0.01. The Over-Allotment Option may be elected with respect to, at the Underwriter's sole discretion, Option Shares and Option Warrants together, solely Option Shares, solely Option Warrants, or any combination thereof. The number of Option Securities to be purchased by each Underwriter shall be the same percentage (adjusted by the Representative to eliminate fractions) of the total number of Option Securities to be purchased by the Underwriters as such Underwriter is purchasing of the Firm Securities. The Over-Allotment Option may be exercised only to cover over-allotments in the sales of the Firm Securities by the Underwriters and may be exercised in whole or in part at anytime on or before 12:00 noon, New York City time, on the business day before the Firm Securities Closing Date (as defined below), and from time to time thereafter within 30 days after the date of this Agreement, in each case upon written, facsimile or electronic notice, or verbal or telephonic notice confirmed by written, facsimile or electronic notice, by the Representative to the Company no later than 12:00 noon, New York City time, on the business day before the Firm Securities Closing Date or at least two business days before the Option Securities Closing Date (as defined below), as the case may be, setting forth the number of Company Option Securities to be purchased and the time and date (if other than the Firm Securities Closing Date) of such purchase.

(c) On the Firm Securities Closing Date, the Company agrees to issue to Newbridge Securities Corporation (for its own account and not as the Representative of the several Underwriters), warrants (the "Underwriter Warrants") to purchase an aggregate of []² Common Shares at a price per share equal to 125% of the Firm Price. The Underwriter Warrants will be exercisable at any time and from time to time on or after six months following the Firm Securities Closing Date (as defined below) up to four years and six months following the Firm Securities Closing Date. Each Underwriter Warrant shall be substantially identical to the form of Warrant filed as an exhibit to the Registration Statement (as defined herein).

(d) Payment of the purchase price for the Firm Securities, and delivery of certificates for the Firm Shares, shall be made at the offices of Newbridge Securities Corporation, 1200 North Federal Highway, Boca Raton, FL 33432, at 10:00 a.m., New York City time, on the second business day following the date of this Agreement or at such time on such other date, not later than ten (10) business days after the date of this Agreement, as shall be agreed upon by the Company and the Representative (such time and date of delivery and payment are called the "Firm Securities Closing Date"). In addition, in the event that any or all of the Option Securities are purchased by the Underwriters, payment of the purchase price, and delivery of the certificates, for such Option Securities shall be made at the above-mentioned offices, or at such other place as shall be agreed upon by the Representative and the Company, on each date of delivery as specified in the notice from the Representative to the Company (such time and date of delivery and payment are called the "Option Securities Closing Date"). The Firm Securities Closing Date and any Option Securities Closing Date are called, individually, a "Closing Date" and, together, the "Closing Dates."

(e) Payment for the Securities shall be made to the Company by wire transfer of immediately available funds or by certified or official bank check or checks payable in New York Clearing House (same day) funds drawn to the order of the Company, against delivery to the Representative for the respective accounts of the Underwriters of certificates for the Securities to be purchased by them.

¹ To be the Firm Price minus \$0.01.

² To be equal to 7.0% of Firm Shares/PFWs.

(f) The Securities shall be registered in such names and shall be in such denominations as the Representative shall request before the Firm Securities Closing Date, or, in the case of Option Securities, on the day of notice of exercise of the option as described in Section 1(b), and the Shares shall be delivered by or on behalf of the Company to the Representative through the facilities of the Depository Trust Company (“DTC”) for the account of such Representative. The original, signed Warrants shall be delivered to the Representative (or its designees) in definitive form and shall be made available for inspection by the Representative on the business day prior to the applicable Closing Date.

2. Representations and Warranties of the Company. The Company represents and warrants to each Underwriter as of the date hereof, as of the Firm Securities Closing Date and as of each Option Securities Closing Date (if any), as follows:

(a) On the Effective Date, the Registration Statement complied, and on the date of the Prospectus, the date any post-effective amendment to the Registration Statement becomes effective, the date any supplement or amendment to the Prospectus is filed with the Commission, the Registration Statement and the Prospectus (and any amendment thereof or supplement thereto) will comply, in all material respects, with the requirements of the Securities Act and the Rules and the Securities and Exchange Act of 1934, as amended (the “Exchange Act”), and the rules and regulations of the Commission thereunder. Neither the Registration Statement nor any amendments thereto as of the times they became effective, contained any untrue statement of a material fact or omit to state any material fact required to be stated therein or necessary in order to make the statements therein not misleading; and on the Effective Date and the other dates referred to above neither the Registration Statement nor the Prospectus, nor any amendment or supplement of either of the foregoing, will contain any untrue statement of a material fact or will omit to state any material fact required to be stated therein or necessary in order to make the statements therein not misleading. When any Preliminary Prospectus was first filed with the Commission (whether filed as part of the Registration Statement or any amendment thereto or pursuant to Rule 424(a) of the Rules) and when any amendment thereof or supplement thereto was first filed with the Commission, such Preliminary Prospectus as amended or supplemented complied in all material respects with the applicable provisions of the Securities Act and the Rules and did not contain any untrue statement of a material fact or omit to state any material fact required to be stated therein or necessary in order to make the statements therein not misleading. If applicable, each Preliminary Prospectus and the Prospectus delivered to the Underwriters for use in connection with this offering was identical to the electronically transmitted copies thereof filed with the Commission pursuant to the Commission’s Electronic Data Gathering, Analysis and Retrieval system (“EDGAR”), except to the extent permitted by Regulation S-T. Notwithstanding the foregoing, none of the representations and warranties in this paragraph 2(a) shall apply to statements in, or omissions from, the Registration Statement, any Preliminary Prospectus or the Prospectus made in reliance upon, and in conformity with, information herein or otherwise furnished in writing by the Representative on behalf of the several Underwriters specifically for use in the Registration Statement, any Preliminary Prospectus or the Prospectus, as the case may be. With respect to the preceding sentence, the Company acknowledges that the only information furnished in writing by the Representative on behalf of the several Underwriters for use in the Registration Statement, any Preliminary Prospectus or the Prospectus is the statements contained in the [●] and [●] paragraphs under the caption “Underwriting” in the Prospectus (collectively, the “Underwriter Information”).

(b) As of the Applicable Time (as hereinafter defined), none of (i) the price to the public and the number of Securities offered and sold, as indicated on the cover page of the Prospectus and the Statutory Prospectus (as hereinafter defined), all considered together (collectively, the “General Disclosure Package”), (ii) any individual Issuer Free Writing Prospectus when considered together with the General Disclosure Package, and (iii) any individual Written Testing-the-Waters Communication (as defined herein), when considered together with the General Disclosure Package, included, includes or will include any untrue statement of a material fact or omitted, omits or will omit to state any material fact required to be stated therein or necessary in order to make the statements therein, in the light of the circumstances under which they were made, not misleading; provided, however, that this representation and warranty shall not apply to statements in or omissions in the General Disclosure Package made in reliance upon and in conformity with the Underwriter Information.

Each Issuer Free Writing Prospectus (as hereinafter defined), including any electronic road show (including without limitation any “bona fide electronic road show” as defined in Rule 433(h)(5) under the Securities Act) (each, a “Road Show”) (i) is identified in Schedule III hereto and (ii) complied when issued, and complies, in all material respects with the requirements of the Securities Act and the Rules and the Exchange Act and the rules and regulations of the Commission thereunder. The Company has made at least one version of the Road Show available without restriction by means of graphic communication to any person, including any potential investor in the Securities (and if there is more than one version of a Road Show for the offering that is a written communication, the version available without restriction was made available no later than the other versions).

As used in this Section and elsewhere in this Agreement:

“Applicable Time” means [●] [a.m.][p.m.] (Eastern time) on the date of this Agreement.

“Issuer Free Writing Prospectus” means each “free writing prospectus” (as defined in Rule 405 of the Rules) prepared by or on behalf of the Company or used or referred to by the Company in connection with the offering of the Securities, including, without limitation, each Road Show

“Statutory Prospectus” as of any time means the Preliminary Prospectus relating to the Securities that is included in the Registration Statement immediately prior to the Applicable Time.

(c) The Registration Statement is effective under the Securities Act and no stop order preventing or suspending the effectiveness of the Registration Statement or suspending or preventing the use of any Preliminary Prospectus, the Prospectus or any “free writing prospectus”, as defined in Rule 405 under the Rules, has been issued by the Commission and no proceedings for that purpose have been instituted or are threatened under the Securities Act. Any required filing of any Preliminary Prospectus and/or the Prospectus and any supplement thereto pursuant to Rule 424(b) of the Rules has been or will be made in the manner and within the time period required by such Rule 424(b). Any material required to be filed by the Company pursuant to Rule 433(d) or

Rule 163(b)(2) of the Rules has been or will be made in the manner and within the time period required by such Rules. The documents incorporated by reference in the Registration Statement, any Preliminary Prospectus and the Prospectus, at the time they became effective or were filed with the Commission, as the case may be, complied in all material respects with the requirements of the Securities Act or the Exchange Act, as applicable, and the rules and regulations of the Commission thereunder, and none of such documents contained an untrue statement of a material fact or omitted to state a material fact required to be stated therein or necessary in order to make the statements therein, in the light of the circumstances under which they were made, not misleading, and any further documents so filed and incorporated by reference in the Registration Statement, any Preliminary Prospectus and the Prospectus, when such documents become effective or are filed with the Commission, as the case may be, will conform in all material respects to the requirements of the Securities Act or the Exchange Act, as applicable, and the rules and regulations of the Commission thereunder and will not contain an untrue statement of a material fact or omit to state a material fact required to be stated therein or necessary to make the statements therein, in light of the circumstances under which they are made, not misleading.

(d) Each Issuer Free Writing Prospectus, as of its issue date and at all subsequent times through the completion of the public offer and sale of the Securities or until any earlier date that the Company notified or notifies the Representative as described in the next sentence, did not, does not and will not include any information that conflicted, conflicts or will conflict with the information contained in the Registration Statement, including any document incorporated by reference therein and any prospectus supplement deemed to be a part thereof that has not been superseded or modified, the Statutory Prospectus or the Prospectus.

If at any time following issuance of an Issuer Free Writing Prospectus there occurred or occurs an event or development as a result of which such Issuer Free Writing Prospectus conflicted or would conflict with the information contained in the Registration Statement, the Statutory Prospectus or the Prospectus or included or would include an untrue statement of a material fact or omitted or would omit to state a material fact required to be stated therein or necessary in order to make the statements therein, in the light of the circumstances prevailing at the subsequent time, not misleading, the Company has promptly notified or will promptly notify the Representative and has promptly amended or will promptly amend or supplement, at its own expense, such Issuer Free Writing Prospectus to eliminate or correct such conflict, untrue statement or omission.

(e) The financial statements filed with the Commission as a part of and included or incorporated by reference in the Registration Statement, the Statutory Prospectus and the Prospectus, present fairly in all material respects the consolidated financial position of the Company and its subsidiaries as of the dates indicated and the results of their operations, changes in shareholders' equity and cash flows for the periods specified. Such financial statements have been prepared in conformity with generally accepted accounting principles as applied in the United States applied on a consistent basis throughout the periods involved, except as may be expressly stated in the related notes thereto. The interactive data in eXtensible Business Reporting Language included or incorporated by reference in the Registration Statement and Prospectus fairly presents the information called for in all material respects and has been prepared in accordance with the Commission's rules and guidelines applicable thereto. No other financial statements or supporting schedules are required to be included in the Registration Statement, the Statutory Prospectus and

the Prospectus. The financial data set forth in each of the Registration Statement, the Statutory Prospectus and the Prospectus fairly present the information set forth therein on a basis consistent with that of the audited financial statements contained in the Registration Statement, the Statutory Prospectus and the Prospectus. To the Company's knowledge, no person who has been suspended or barred from being associated with a registered public accounting firm, or who has failed to comply with any sanction pursuant to Rule 5300 promulgated by the Public Company Accounting Oversight Board ("PCAOB"), has participated in or otherwise aided the preparation of, or audited, the financial statements, supporting schedules or other financial data filed with the Commission as a part of and included in the Registration Statement, the Statutory Prospectus and the Prospectus.

(f) KPMG LLP (the "Auditor"), which has expressed its opinion with respect to the financial statements (which term as used in this Agreement includes the related notes thereto) filed with the Commission as a part of the Registration Statement and the Prospectus, was during the periods covered by its reports (i) an independent registered public accounting firm as required by the Securities Act, the Exchange Act, and the rules of the PCAOB, (ii) in compliance with the applicable requirements relating to the qualification of accountants under Rule 2-01 of Regulation S-X under the Securities Act and (iii) a registered public accounting firm as defined by the PCAOB whose registration has not been suspended or revoked and who has not requested such registration to be withdrawn.

(g) The Company and each of its subsidiaries, including each entity (corporation, partnership, joint venture, association or other business organization) controlled directly or indirectly by the Company (each, a "subsidiary"), (i) is duly organized, validly existing and in good standing under the laws of their respective jurisdictions of incorporation or organization and each such entity has all requisite power and authority to carry on its business as is currently being conducted as described in the Statutory Prospectus and the Prospectus, and to own, lease and operate its properties and to enter into and perform its obligations pursuant to the public offer and sale of Securities and this Agreement, and (ii) has duly authorized, executed and delivered this Agreement and the other agreements to be entered into by it in connection with the public offer and sale of Securities, and each of them, assuming due authorization, execution and delivery by the other parties hereto or thereto, constitutes legal, valid and binding obligations enforceable against it in accordance with their respective terms. All of the issued shares of capital stock of, or other ownership interests in, each subsidiary have been duly and validly authorized and issued and are fully paid and non-assessable and are owned, directly or indirectly, by the Company, free and clear of any lien, charge, mortgage, pledge, security interest, claim, limitation on voting rights, equity, trust or other encumbrance, preferential arrangement, defect or restriction of any kind whatsoever. The Company and each of its subsidiaries is duly qualified to do business and is in good standing as a foreign corporation in each jurisdiction in which the nature of the business conducted by it or location of the assets or properties owned, leased or licensed by it requires such qualification, except for such jurisdictions where the failure to so qualify individually or in the aggregate would not have a material adverse effect on the assets, properties, condition, financial or otherwise, or in the results of operations, business affairs or business prospects of the Company and its subsidiaries considered as a whole or in the context of the public offer and sale of Securities or underwriting of the Securities (a "Material Adverse Effect"); and to the Company's knowledge, no proceeding has been instituted or is threatened in any such jurisdiction revoking, limiting or curtailing, or seeking to revoke, limit or curtail, such power and authority or qualification or taken against it for its winding-up, liquidation or dissolution or for any similar or analogous proceeding in any jurisdiction, or for it to enter into any arrangement or composition for the benefit of creditors, or for the appointment of a receiver, administrative receiver, trustee or similar officer.

(h) (i) At the time of filing the Registration Statement and (ii) on the date hereof, the Company was not and is not an “ineligible issuer,” as defined in Rule 405 of the Rules, including (but not limited to) the Company or any other subsidiary in the preceding three (3) years not having been convicted of a felony or misdemeanor or having been made the subject of a judicial or administrative decree or order as described in Rule 405 of the Rules.

(i) Except as disclosed in the Registration Statement, General Disclosure Package, Statutory Prospectus and the Prospectus, the Company and each of its subsidiaries (i) owns, possesses, or has valid and enforceable licenses or other legally enforceable rights to use all patents, patent rights, inventions, trademarks, trademark applications, trade names, service marks, copyrights, copyright applications, licenses, know-how (including trade secrets and other unpatented and/or unpatentable proprietary or confidential information, systems, processes or procedures) and other similar rights and proprietary knowledge (in each case, whether registered or not and including applications for registration) (collectively, “Intangibles”) that is, to the knowledge of the Company, necessary for the conduct of its business. Neither the Company nor any of its subsidiaries has received any notice of, or is not aware of, any infringement of or conflict with valid asserted rights of others with respect to any Intangibles and neither the Company nor any of its subsidiaries has knowledge of any infringement of or conflict with valid asserted rights of others or of any infringement of, or conflict with the Company and its subsidiaries’ rights with respect to any Intangibles, (ii) the conduct of the Company’s business does not, to its knowledge, infringe Intangibles of a third party and neither of the Company nor any of its subsidiaries has received any notice of infringement of or conflict with, and neither of the Company nor any of its subsidiaries has knowledge of any infringement of or conflict with, valid asserted rights of a third party with respect to any Intangibles, except for or in respect of any such infringements or conflicts that would not, individually or in the aggregate, have a Material Adverse Effect.

(j) The Company has filed all reports, schedules, forms, statements and other documents required to be filed by the Company under the Securities Act and the Exchange Act, including pursuant to Section 13(a) or 15(d) thereof, for the two years preceding the date hereof (or such shorter period as the Company was required by law or regulation to file such material) (the foregoing materials, including the exhibits thereto and documents incorporated by reference therein, together with the Prospectus, being collectively referred to herein as the “SEC Reports”) on a timely basis or has received a valid extension of such time of filing and has filed any such SEC Reports prior to the expiration of any such extension. As of their respective dates, the SEC Reports complied in all material respects with the requirements of the Securities Act and the Exchange Act, as applicable, and none of the SEC Reports, when filed, contained any untrue statement of a material fact or omitted to state a material fact required to be stated therein or necessary in order to make the statements therein, in the light of the circumstances under which they were made, not misleading. The Company has never been an issuer subject to Rule 144(i) under the Securities Act. The financial statements of the Company included in the SEC Reports comply in all material respects with applicable accounting requirements and the rules and regulations of the Commission with respect thereto as in effect at the time of filing. Such financial statements have been prepared in accordance with United States generally accepted accounting principles in the United States, applied on a consistent basis during the periods involved

("GAAP"), except as may be otherwise specified in such financial statements or the notes thereto and except that unaudited financial statements may not contain all footnotes required by GAAP, and fairly present in all material respects the financial position of the Company and its consolidated Subsidiaries as of and for the dates thereof and the results of operations and cash flows for the periods then ended, subject, in the case of unaudited statements, to normal, immaterial, year-end audit adjustments. The agreements and documents described in the Registration Statement, the Preliminary Prospectus, the General Disclosure Package, the Prospectus, and the SEC Reports conform in all material aspects to the descriptions thereof contained therein and there are no agreements or other documents required by the Securities Act and the rules and regulations thereunder to be described in the Registration Statement, the Preliminary Prospectus, the General Disclosure Package, the Prospectus or the SEC Reports or to be filed with the Commission as exhibits to the Registration Statement, that have not been so described or filed. Each agreement or other instrument (however characterized or described) to which the Company is a party or by which it is or may be bound or affected and that is listed in the exhibits to the Registration Statement and is material to the Company's business, has been duly authorized and validly executed by the Company, is in full force and effect in all material respects and is enforceable against the Company and, to the Company's knowledge, the other parties thereto, in accordance with its terms, except (x) as such enforceability may be limited by bankruptcy, insolvency, reorganization or similar laws affecting creditors' rights generally, (y) as enforceability of any indemnification or contribution provision may be limited under the federal and state securities laws, and (z) that the remedy of specific performance and injunctive and other forms of equitable relief may be subject to the equitable defenses and to the discretion of the court before which any proceeding therefore may be brought. None of such agreements or instruments has been assigned by the Company, and neither the Company nor, to the Company's knowledge, any other party is in default thereunder and, to the Company's knowledge, no event has occurred that, with the lapse of time or the giving of notice, or both, would constitute a default thereunder. To the Company's knowledge, performance by the Company of the material provisions of such agreements or instruments will not result in a violation of any existing applicable law, rule, regulation, judgment, order or decree of any governmental agency or court, domestic or foreign, having jurisdiction over the Company or any of its assets or businesses, including, without limitation, those relating to environmental laws and regulations, except in each case, as would not reasonably be expected to have a Material Adverse Effect.

(k) Subsequent to the respective dates as of which information is given in the Registration Statement, the Statutory Prospectus and the Prospectus, (i) there has not been any event which could have a Material Adverse Effect; (ii) neither the Company nor any of its subsidiaries has sustained any loss or interference with its assets, businesses or properties (whether owned or leased) from fire, explosion, earthquake, flood or other calamity, whether or not covered by insurance, or from any labor dispute or any court or legislative or other governmental action, order or decree which would have a Material Adverse Effect; and (iii) since the date of the latest balance sheet included in the Registration Statement and the Prospectus, neither the Company nor its subsidiaries has (A) issued any securities or incurred any liability or obligation, direct or contingent, for borrowed money, except such liabilities or obligations incurred in the ordinary course of business, (B) entered into any transaction not in the ordinary course of business or (C) declared or paid any dividend or made any distribution on any shares of its stock or redeemed, purchased or otherwise acquired or agreed to redeem, purchase or otherwise acquire any shares of its capital stock.

(l) There is no document, contract or other agreement required to be described in the Registration Statement, the Statutory Prospectus or the Prospectus or to be filed as an exhibit to the Registration Statement which is not described or filed as required by the Securities Act or Rules. Each description of a contract, document or other agreement in the Registration Statement, the Statutory Prospectus or the Prospectus accurately reflects in all material respects the terms of the underlying contract, document or other agreement. Each contract, document or other agreement listed in the exhibits to the Registration Statement is in full force and effect and is valid and enforceable by and against the Company or its subsidiary, as the case may be, in accordance with its terms. Neither the Company nor any of its subsidiaries, if a subsidiary is a party, nor to the Company's knowledge, any other party, is in default in the observance or performance of any term or obligation to be performed by it under any such agreement, and to the Company's knowledge, no event has occurred which with notice or lapse of time or both would constitute such a default, in any such case which default or event, individually or in the aggregate, would have a Material Adverse Effect. No default exists, and no event has occurred which with notice or lapse of time or both would constitute a default, in the due performance and observance of any term, covenant or condition, by the Company or its subsidiary, if a subsidiary is a party thereto, of any other agreement or instrument to which the Company or any of its subsidiaries is a party or by which Company or its properties or business or a subsidiary or its properties or business may be bound or affected which default or event, individually or in the aggregate, would have a Material Adverse Effect.

(m) The statistical and market related data included in the Registration Statement, the Statutory Prospectus or the Prospectus are based on or derived from sources that the Company believes to be reliable and accurate.

(n) Neither the Company nor any subsidiary (i) is in violation of its certificate or articles of incorporation, bylaws, certificate of formation, limited liability company agreement, partnership agreement or other organizational documents, (ii) is in default under, and no event has occurred which, with notice or lapse of time, or both, would constitute a default under, or result in the creation or imposition of any lien, charge, mortgage, pledge, security interest, claim, limitation on voting rights, equity, trust or other encumbrance, preferential arrangement, defect or restriction of any kind whatsoever, upon, any property or assets of the Company or any subsidiary pursuant to, any bond, debenture, note, indenture, mortgage, deed of trust, loan agreement or other agreement or instrument to which it is a party or by which it is bound or to which any of its properties or assets is subject, or (iii) is in violation of any statute, law, rule, regulation, ordinance, directive, judgment, decree or order of any judicial, regulatory or other legal or governmental agency or body, foreign or domestic.

(o) The Company has full right, power and authority to execute and deliver this Agreement and the Warrants, and to perform its obligations hereunder and thereunder; and all action required to be taken for the due and proper authorization, execution and delivery by it of this Agreement and the Warrants, and the consummation by it of the transactions contemplated hereby and thereby has been duly and validly taken.

(p) This Agreement and the Warrants have been duly authorized, executed and delivered by the Company and each, assuming the due authorization, execution and delivery by the other parties hereto, constitutes a valid and legally binding agreement of the Company, enforceable in

accordance with its terms, except as (i) the enforcement hereof may be limited by bankruptcy, insolvency, fraudulent transfer, reorganization, moratorium or other similar laws relating to or affecting the rights and remedies of creditors or by general equitable principles (whether considered in a proceeding at law or in equity) relating to enforceability and (ii) rights to indemnification and contribution hereunder may be limited by applicable law and public policy considerations.

(q) Neither the execution, delivery and performance of this Agreement by the Company nor the consummation of any of the transactions contemplated hereby (including, without limitation, the issuance and sale by the Company of the Securities) will give rise to a right to terminate or accelerate the due date of any payment due under, or conflict with or result in the breach of any term or provision of, or constitute a default (or an event which with notice or lapse of time or both would constitute a default) under, or require any consent or waiver under, or result in the execution or imposition of any lien, charge or encumbrance upon any properties or assets of the Company or its subsidiaries pursuant to the terms of, any indenture, mortgage, deed of trust or other agreement or instrument to which the Company or any of its subsidiaries is a party or by which either the Company or its subsidiaries or any of their properties or businesses is bound, or any franchise, license, permit, judgment, decree, order, statute, rule or regulation applicable to the Company or any of its subsidiaries or violate any provision of the charter or bylaws or other organizational documents of the Company or any of its subsidiaries, except for such consents or waivers which have already been obtained and are in full force and effect.

(r) The Company has authorized and outstanding capital stock as set forth under the caption "Capitalization" in the Statutory Prospectus and the Prospectus. All of the issued and outstanding shares of capital stock of the Company have been duly and validly issued and are fully paid and nonassessable and have been issued in compliance with all federal, state and local laws and regulations. There are no statutory preemptive or other similar rights to subscribe for or to purchase or acquire any shares of capital stock of the Company or any of its subsidiaries, or any such rights pursuant to its charter, certificate of incorporation or bylaws or any other applicable organizational documents or any agreement or instrument to or by which the Company or any of its subsidiaries is a party or bound. The Securities have been duly authorized for issuance and sale pursuant to this Agreement. When issued and sold pursuant to this Agreement, the Shares will be duly and validly issued, fully paid and nonassessable and none of them will be issued in violation of any preemptive or other similar right. When paid for and issued in accordance with the Warrants, the Warrant Shares will be validly issued, fully paid and non-assessable and none of them will be issued in violation of any preemptive or other similar right. Except as disclosed in the Registration Statement, the Statutory Prospectus and the Prospectus, there is no outstanding option, warrant or other right calling for the issuance of, and there is no commitment, plan or arrangement to issue, any share of capital stock of the Company or any of its subsidiaries or any security convertible into, or exercisable or exchangeable for, such shares. The exercise price of each option to acquire Common Shares (each, a "Company Stock Option") is no less than the fair market value of a share of Common Shares as determined on the date of grant of such Company Stock Option. All grants of Company Stock Options were validly issued and properly approved by the Board of Directors of the Company (and, if required, by a committee of the Board of Directors of the Company and/or the shareholders of the Company) in material compliance with all applicable laws and the terms of the plans under which such Company Stock Options were issued and were recorded on the financial statements of the Company, in accordance with generally accepted

accounting principles in the United States, and no such grants involved any “back dating”, “forward dating,” “spring loading” or similar practices with respect to the effective date of grant. The Securities conform in all material respects to all statements in relation thereto contained in the Registration Statement and the Statutory Prospectus and the Prospectus.

(s) As of the date hereof, the Company has reserved and the Company shall continue to reserve and keep available at all times from its duly authorized capital stock, free of preemptive rights, a sufficient number of Common Shares for the purpose of enabling the Company to issue Warrant Shares issuable upon exercise of outstanding Warrants.

(t) No holder of any security of the Company has any right, which has not been waived, to have any security owned by such holder included in the Registration Statement or to demand registration of any security owned by such holder for a period of ninety (90) days after the date of this Agreement. Each director and executive officer of the Company listed on Schedule II hereto has delivered to the Representative his enforceable written lock-up agreement in the form attached to this Agreement as Exhibit C hereto (“Lock-Up Agreement”).

(u) There are no legal or governmental proceedings pending to which the Company or any of its subsidiaries is a party or of which any property of the Company or any of its subsidiaries is the subject which, if determined adversely to the Company or any of its subsidiaries could, except as set forth in or contemplated in the Registration Statement, General Disclosure Package, Statutory Prospectus and the Prospectus, individually or in the aggregate have a Material Adverse Effect; and, to the knowledge of the Company, no such proceedings are threatened or contemplated by governmental authorities or threatened by others.

(v) Neither the Company nor any of its subsidiaries is involved in any labor dispute with its employees nor, to the knowledge of the Company, is any such dispute threatened, which dispute would have a Material Adverse Effect, except as set forth in or contemplated in the Registration Statement, General Disclosure Package, Statutory Prospectus and the Prospectus. The Company is not aware of any existing or imminent labor disturbance by the employees of any of its principal suppliers or contractors which would reasonably be expected to have a Material Adverse Effect, except as set forth in or contemplated in the Registration Statement, General Disclosure Package, Statutory Prospectus and the Prospectus. The Company is not aware of any threatened or pending litigation between the Company or its subsidiaries and any of its executive officers which, if adversely determined, could have a Material Adverse Effect.

(w) No transaction has occurred between or among the Company and any of its officers or directors, shareholders or any affiliate or affiliates of any such officer or director or shareholder that is required to be described in and is not described in the Registration Statement, the Statutory Prospectus and the Prospectus.

(x) The Company has not taken, nor will it take, directly or indirectly, any action designed to, or which might reasonably be expected to cause or result in, or which has constituted or which might reasonably be expected to constitute, the stabilization or manipulation of the price of the Common Shares or any security of the Company to facilitate the sale or resale of any of the Securities.

(y) The Company has filed all tax returns that are required to be filed or has requested extensions thereof (except (i) in any case where such failure to file would not reasonably be expected to have a Material Adverse Effect or (ii) as set forth in or contemplated in the General Disclosure Package, Statutory Prospectus and the Prospectus (exclusive of any amendment or supplement thereto)) and has paid all taxes required to be paid by it and any other assessment, fine or penalty levied against it, to the extent that any of the foregoing is due and payable, except (i) where any such failure to pay, assessment, fine or penalty is currently being contested in good faith or would not reasonably be expected to have a Material Adverse Effect or (ii) as set forth in or, contemplated in, the General Disclosure Package, Statutory Prospectus and the Prospectus (exclusive of any amendment or supplement thereto).

(z) The Common Shares are registered pursuant to Section 12(b) or 12(g) of the Exchange Act and are listed on The Nasdaq Capital Market (“Nasdaq”) and the Toronto Stock Exchange (“TSX”), and the Company has taken no action designed to, or likely to have the effect of, terminating the registration of the Common Shares under the Exchange Act or delisting the Common Shares from Nasdaq or the TSX, nor, except as disclosed in the Registration Statement, the Statutory Prospectus and the Prospectus, has the Company received any notification that the Commission, Nasdaq, or the TSX is contemplating terminating such registration or listing. Except as disclosed in the Registration Statement, the Statutory Prospectus and the Prospectus, the Company is in compliance with all applicable listing requirements of Nasdaq and the TSX and is in compliance with the requirements of Nasdaq and the TSX for the continued listing of the Common Shares.

(aa) The Company has taken no action designed to, or likely to have the effect of, terminating the registration of the Securities under the Exchange Act or the quotation of the Common Shares on the Nasdaq Capital Market or TSX, nor has the Company received any notification that the Commission or the Nasdaq Capital Market or the TSX is contemplating terminating such registration or quotation.

(bb) The books, records and accounts of the Company and its subsidiaries accurately and fairly reflect the transactions in, and dispositions of, the assets of, and the results of operations of, the Company and its subsidiaries. The Company and each of its subsidiaries, considered together as one entity, maintains a system of internal accounting controls sufficient to provide reasonable assurances that (i) transactions are executed in accordance with management’s general or specific authorizations, (ii) transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles in the United States and to maintain asset accountability, (iii) access to assets is permitted only in accordance with management’s general or specific authorization and (iv) the recorded accountability for assets is compared with the existing assets at reasonable intervals and appropriate action is taken with respect to any differences. The Company maintains, and periodically reviews, written policies and has implemented written procedures reasonably designed to cause it and its directors, officers and employees, when acting for the Company, to comply with the laws, rules and regulations applicable to the company and its business activities.

(cc) The Company and its subsidiaries, considered together as one entity, have established and maintain disclosure controls and procedures (as such term is defined in Rule 13a-15 under the Exchange Act) and such disclosure controls and procedures are effective in all material respects to perform the functions for which they were established.

(dd) Based on the evaluation of its disclosure controls and procedures, the Company is not aware of (i) any material weakness or significant deficiency in the design or operation of internal controls which could adversely affect the Company's ability to record, process, summarize and report financial data or any material weaknesses in internal controls; or (ii) any fraud, whether or not material, that involves management or other employees who have a role in the Company's internal controls.

(ce) As preapproved in accordance with the requirements set forth in Section 10A of the Exchange Act, the Auditor has not been engaged by the Company to perform any "prohibited activities" (as defined in Section 10A of the Exchange Act).

(ff) There are no material off-balance sheet arrangements (as defined in Item 303 of Regulation S-K) that have or are reasonably likely to have a material current or future effect on the Company's financial condition, revenues or expenses, changes in financial condition, results of operations, liquidity, capital expenditures or capital resources.

(gg) The Company's Board of Directors has validly appointed an audit committee whose composition satisfies the requirements of Rule 5605 of the Nasdaq Stock Market and the Board of Directors and/or the audit committee has adopted a charter that satisfies the requirements of Rule 5605 of the Nasdaq Stock Market. The audit committee has reviewed the adequacy of its charter within the past twelve (12) months.

(hh) The Company is in compliance with all other applicable provisions of the Sarbanes-Oxley Act of 2002, as amended (the "Sarbanes-Oxley Act"), any related rules and regulations promulgated by the Commission and corporate governance requirements under applicable Nasdaq regulations upon the effectiveness of such provisions and has no reason to believe that it will not be able to comply with such provisions at the time of effectiveness. There is and has been no failure on the part of the Company or any of its directors or officers, in their capacities as such, to comply with any provision of the Sarbanes-Oxley Act, including, without limitation, Section 402 related to loans and Sections 302 and 906 related to certifications.

(ii) The Company and its subsidiaries are insured by insurers of recognized financial responsibility against such losses and risks and in such amounts as the Company reasonably believes are prudent and customary in the businesses in which they are engaged; all policies of insurance insuring the Company or any of its subsidiaries or the Company's or its subsidiaries' respective businesses, assets, employees, officers and directors are in full force and effect; the Company and each of its subsidiaries are in compliance with the terms of such policies and instruments in all material respects; and neither the Company nor any subsidiary of the Company has any reason to believe that it will not be able to renew its existing insurance coverage as and when such coverage expires or to obtain similar coverage from similar insurers as may be necessary to continue its business at a cost that would not reasonably be expected to have a Material Adverse Effect, except as set forth in the General Disclosure Package, Statutory Prospectus and the Prospectus (exclusive of any amendment or supplement thereto). Neither the Company nor any of its subsidiaries has been denied any insurance coverage which it has sought or for which it has applied.

(jj) Each approval, consent, order, authorization, designation, declaration or filing of, by or with any regulatory, administrative or other governmental body necessary in connection with the execution and delivery by the Company of this Agreement and the Warrants and the consummation of the transactions herein and therein contemplated required to be obtained or performed by the Company has been obtained or performed, except for (i) such additional steps as may be required by the Financial Industry Regulatory Authority ("FINRA") or the TSX; (ii) as may be necessary to qualify the Securities for public offering by the Underwriters under the state securities or Blue Sky laws; and (iii) the approval by the Nasdaq Capital Market for the listing of the Common Shares, including the Warrant Shares, sold pursuant to this Agreement.

(kk) None of the Company's officers or directors or, to the best of the knowledge of the Company, any five percent or greater stockholder of the Company are affiliated with or are associated persons of any member of FINRA, except as set forth in the Registration Statement or otherwise disclosed in writing to the Representative.

(ll) (i) Each of the Company and each of its subsidiaries is in compliance in all material respects with all rules, laws and regulation relating to the use, treatment, storage and disposal of toxic substances and protection of health or the environment (each such law, an "Environmental Law") which are applicable to its business; (ii) neither the Company nor its subsidiaries has received any notice from any governmental authority or third party of an asserted claim under Environmental Laws; (iii) each of the Company and each of its subsidiaries has received all permits, licenses or other approvals required of it under applicable Environmental Laws to conduct its business and is in compliance with all terms and conditions of any such permit, license or approval; (iv) to the Company's knowledge, no facts currently exist that will require the Company or any of its subsidiaries to make future material capital expenditures to comply with Environmental Laws; and (v) no property which is or has been owned, leased or occupied by the Company or its subsidiaries has been designated as a Superfund site pursuant to the Comprehensive Environmental Response, Compensation of Liability Act of 1980, as amended (42 U.S.C. Section 9601, et. seq.) ("CERCLA 1980") or otherwise designated as a contaminated site under other Environmental Laws. Neither the Company nor any of its subsidiaries has been named as a "potentially responsible party" under CERCLA 1980.

(mm) In the ordinary course of its business, the Company periodically reviews the effect of Environmental Laws on the business, operations and properties of the Company and its subsidiaries, in the course of which the Company identifies and evaluates associated costs and liabilities (including, without limitation, any capital or operating expenditures required for clean-up, closure of properties or compliance with Environmental Laws, or any permit, license or approval, any related constraints on operating activities and any potential liabilities to third parties). On the basis of such review, the Company has reasonably concluded that such associated costs and liabilities would not, singly or in the aggregate, have a Material Adverse Effect.

(nn) The Company is not and, immediately after giving effect to the sale of the Securities and the application of proceeds thereof as described in the Statutory Prospectus and the Prospectus under the caption "Use of Proceeds", will not be required to be registered as an "investment company" within the meaning of the Investment Company Act of 1940, as amended (the "Investment Company Act").

(oo) Neither the Company nor any of its subsidiaries nor, to the knowledge of the Company, any director, officer, agent, employee, affiliate or other person acting on behalf of the Company or any of its subsidiaries is aware of or has taken any action, directly or indirectly, that could result in a violation or a sanction for violation by such persons of the Foreign Corrupt Practices Act of 1977 or the U.K. Bribery Act 2010, each as may be amended, or similar law of any other relevant jurisdiction, or the rules or regulations thereunder to which the Company and its subsidiaries are subject (the “Anti-Corruption Laws”); and the Company and its subsidiaries have instituted and maintain policies and procedures designed to ensure compliance therewith. No part of the proceeds of the offering will be used, directly or indirectly, in violation of the Anti-Corruption Laws.

(pp) The operations of the Company and its subsidiaries are and have been conducted at all times in compliance with applicable financial recordkeeping and reporting requirements of the Currency and Foreign Transactions Reporting Act of 1970, as amended, the money laundering statutes of all jurisdictions, the rules and regulations thereunder and any related or similar rules, regulations or guidelines, issued, administered or enforced by any governmental agency (collectively, the “Money Laundering Laws”) and no action, suit or proceeding by or before any court or governmental agency, authority or body or any arbitrator involving the Company or any of its subsidiaries with respect to the Money Laundering Laws is pending, or to the best knowledge of the Company, threatened.

(qq) Neither the Company nor any of its subsidiaries nor, to the knowledge of the Company, any director, officer, agent, employee or affiliate of the Company or any of its subsidiaries, is currently subject to any U.S. sanctions administered by the Office of Foreign Assets Control of the U.S. Treasury Department (“OFAC”); and the Company will not directly or indirectly use the proceeds of the offering, or lend, contribute or otherwise make available such proceeds to any subsidiary, joint venture partner or other person or entity, for the purpose of financing the activities of any person currently subject to any U.S. sanctions administered by OFAC.

(rr) The Company has fulfilled its obligations, if any, under the minimum funding standards of Section 302 of the U.S. Employee Retirement Income Security Act of 1974 (“ERISA”) and the regulations and published interpretations thereunder with respect to each “plan” as defined in Section 3(3) of ERISA and such regulations and published interpretations in which its employees are eligible to participate and each such plan is in compliance in all material respects with the presently applicable provisions of ERISA and such regulations and published interpretations. No “Reportable Event” (as defined in 12 ERISA) has occurred that would reasonably be expected to have a Material Adverse Effect with respect to any “Pension Plan” (as defined in ERISA) for which the Company could have any liability.

(ss) None of the Company, its directors or its officers has distributed nor will distribute prior to the later of (i) the latest Closing Date and (ii) completion of the distribution of the Securities, any offering material in connection with the offering and sale of the Securities other than any Preliminary Prospectus, the Prospectus, the Registration Statement and other materials, if any, permitted by the Securities Act and consistent with the terms of this Agreement.

(tt) Since the date of the preliminary prospectus included in the Registration Statement filed with the Commission on [●], 2023 (or, if earlier, the first date on which the Company engaged directly or through any Person authorized to act on its behalf in any Testing-the-Waters Communication (as defined herein)) through the date hereof, the Company has been and is an “emerging growth company,” as defined in Section 2(a) of the Securities Act (an “Emerging Growth Company”). “Testing-the-Waters Communication” means any oral or written communication by the Company or by any person authorized to act on its behalf, with potential investors undertaken in reliance on Section 5(d) of the Securities Act.

(uu) The Company (a) has not alone engaged in any Testing-the-Waters Communication other than Testing-the-Waters Communications with the consent of the Representative with entities that are qualified institutional buyers within the meaning of Rule 144A under the Securities Act or institutions that are accredited investors within the meaning of Rule 501 under the Securities Act, and (b) has not authorized anyone other than the Representative to engage in Testing-the-Waters Communications. The Company reconfirms that the Representative has been authorized to act on its behalf in undertaking Testing-the-Waters Communications. The Company has not distributed any Written Testing-the-Waters Communications (as defined herein) other than those listed on Schedule IV hereto. “Written Testing-the-Waters Communication” means any Testing-the-Waters Communication that is a written communication within the meaning of Rule 405 under the Securities Act.

(vv) [Omitted]

(ww) The Company and each of its subsidiaries has all requisite corporate power and authority, and all necessary authorizations, approvals, consents, orders, licenses, certificates and permits of and from all governmental or regulatory bodies or any other person or entity (collectively, the “Permits”), to own, lease and license its assets and properties and conduct its business, all of which are valid and in full force and effect, except where the lack of such Permits, individually or in the aggregate, would not have a Material Adverse Effect. The Company and each of its subsidiaries has fulfilled and performed in all material respects all of its obligations with respect to such Permits and no event has occurred that allows, or after notice or lapse of time would allow, revocation or termination thereof or results in any other material impairment of the rights of the Company thereunder. Except as may be required under the Securities Act and state and foreign Blue Sky laws, no other Permits are required to enter into, deliver and perform this Agreement and to issue and sell the Securities.

(xx) Any certificate signed by an officer of the Company and delivered to the Underwriters or to counsel for the Underwriters pursuant to the terms of this Agreement shall be deemed a representation and warranty by the Company, as appropriate, to the Underwriters as to matters covered thereby.

(yy) Without limiting the Company’s representation and warranty under (a) above, all forward-looking statements, forecasts, estimates, targets and predictions and expressions of opinion, belief, intention and expectation made by the Company expressed in or included in the

Registration Statement and in the General Disclosure Package have been made on reasonable grounds after due and careful consideration of such relevant circumstances and assumptions reasonably deemed relevant by the Company and there are no facts which have not been disclosed which by their omission make any such estimates materially misleading or which are material for disclosure. To the Company's knowledge, each of the assumptions used in the preparation of the forward-looking statements, forecasts, estimates, targets and predictions are reasonable and, to the Company's knowledge, there are no other material assumptions that should reasonably be taken into account in the preparation of such information and the adjustments used therein are appropriate to give effect to the transactions and circumstances referred to therein.

(zz) (i) No outstanding indebtedness of the Company or any of its subsidiaries has become repayable before its stated maturity, nor has any security in respect of such indebtedness become enforceable by reason of default by the Company or any of its subsidiaries, and no event has occurred or is, to the Company's knowledge, impending which, with the lapse of time or the fulfilment of any condition or the giving of notice or the compliance with any other formality, may reasonably be expected to result in any such indebtedness becoming so repayable or any such security becoming enforceable and neither the Company nor any of its subsidiaries has received notice from any person to whom any indebtedness of the Company or any of its subsidiaries which is repayable on demand is owed, demanding or, to the Company's knowledge, threatening to demand repayment of, or to take any steps to enforce any security for, the same; (ii) the amounts borrowed by the Company or any of its subsidiaries do not exceed any limitation (A) on borrowing contained in its constitutional documents, any debenture or other deed or document binding upon them, and neither the Company nor any of its subsidiaries has outstanding any loan capital, or is or has engaged in a financing of a type which would not be required to be shown or reflected in its audited accounts, except in any such case as would not, individually or in the aggregate, have a Material Adverse Effect; and (B) all borrowing facilities of each of the Company and each of its subsidiaries have been duly executed by the Company and each of its subsidiaries and are in full force and effect and are in compliance with all covenants and undertakings contained therein, except as may terminate in accordance with their terms.

(aaa) The Company and its subsidiaries have no pending insolvency, bankruptcy, composition or similar proceedings pending against them and have no reason to believe that any such proceeding may be brought and are not in liquidation or receivership.

(bbb) (i) All the information and communications technologies required for use in the business of the Company and its subsidiaries, including, without limitation, hardware, proprietary and third party software, networks, peripherals and associated documentation and any IT systems currently being implemented by the Company ("IT Systems") used in connection with the businesses of the Company and its subsidiaries: (A) are owned by, or properly licensed or leased to, the Company or its subsidiaries, as applicable, and are not dependent on any facilities or systems which are not under the ownership or control of the Company and its subsidiaries and the Company and its subsidiaries do not share any user rights with any other person; and (B) are all the IT Systems required for the present needs of the business of the Company and its subsidiaries and the Company has taken reasonable steps to ensure system capacity and ability to process current peak volumes in a timely manner; (ii) in relation to the IT Systems, there has not been any act or default by the Company or any of its subsidiaries or their sub-lessees, sub-licensees, sub-contractors nor any other person, and there is no breach of any lease, license, support, maintenance

service agreement, understanding or other arrangement (together, “**IT Contracts**”) granted or provided by a third party in favor of the Company or any of its subsidiaries which may in any way, in the reasonable opinion of the Company, result in any IT Contract being terminated. There is no reason to believe that any IT Contract granted or provided by a third party will not be renewed when it expires on the same or substantially the same terms (including as regards pricing and any other commercial details); (iii) there are no circumstances in which the ownership, benefit or right to use the IT Systems may be lost or rendered liable to termination, by virtue of the making of the public offer and sale of Securities as contemplated by this Agreement (and the Registration Statement and the General Disclosure Package), the entry into and performance of this Agreement and each agreement referred to in it, or the offering and sale of the Securities, except for any such losses or terminations that would not, individually or in the aggregate, have a Material Adverse Effect or otherwise be material in the context of the offering of Securities.

(ccc) The Company and its subsidiaries comply in all material respects with all applicable data protection laws, guidelines and industry standards and of any privacy policies of its own. Neither the Company nor any of its subsidiaries has received any notice from a competent authority (including any information or enforcement notice, or any transfer prohibition notice) alleging that the Company or any of its subsidiaries has not complied with applicable data protection laws, guidelines and industry standards. None of the Company or any of its subsidiaries has received any material unresolved written claim from an individual for compensation for breaches of applicable data protection laws or for loss or unauthorized disclosure of personal data.

(ddd) Neither the Company nor any of its subsidiaries has engaged in price exchange, price fixing or other comparable anti-competitive practices. Neither the Company nor any of its subsidiaries is a party to any agreement, arrangement or concerted practice or is carrying on any practice which in whole or in part contravenes or is invalidated by any anti-trust, anti-monopoly, competition, fair trading, consumer protection or similar legislation in any jurisdiction of the Company or any of its subsidiaries is established or operating or in respect of which any filing, registration or notification is required or is advisable pursuant to such legislation (whether or not the same has in fact been made), except for any such contraventions or invalidations, or any such failures to make a filing, registration or notification, that would not, individually or in the aggregate, have a Material Adverse Effect or otherwise be material in the context of the public offer and sale of Securities.

(eee) Neither the Company, nor any of its Affiliates, nor any Person acting on its or their behalf has, directly or indirectly, made any offers or sales of any security or solicited any offers to buy any security, under circumstances that would cause this offering of the Securities to be integrated with prior offerings by the Company for purposes of any applicable shareholder approval provisions of any Trading Market on which any of the securities of the Company are listed or designated.

3. Conditions of the Underwriters’ Obligations. The obligations of the Underwriters under this Agreement are several and not joint. The respective obligations of the Underwriters to purchase the Securities are subject to each of the following terms and conditions:

(a) Notification that the Registration Statement has become effective shall have been received by the Representative and the Prospectus shall have been timely filed with the

Commission in accordance with Section 4(a) of this Agreement and any material required to be filed by the Company pursuant to Rule 433(d) of the Rules shall have been timely filed with the Commission in accordance with such rule.

(b) No order preventing or suspending the use of any Preliminary Prospectus, the Prospectus or any "free writing prospectus" (as defined in Rule 405 of the Rules), shall have been or shall be in effect and no order suspending the effectiveness of the Registration Statement shall be in effect and no proceedings for such purpose shall be pending before or threatened by the Commission, and any requests for additional information on the part of the Commission (to be included in the Registration Statement or the Prospectus or otherwise) shall have been complied with to the satisfaction of the Commission and the Representative. If the Company has elected to rely upon Rule 430A, Rule 430A information previously omitted from the effective Registration Statement pursuant to Rule 430A shall have been transmitted to the Commission for filing pursuant to Rule 424(b) within the prescribed time period and the Company shall have provided evidence satisfactory to the Underwriters of such timely filing, or a post-effective amendment providing such information shall have been promptly filed and declared effective in accordance with the requirements of Rule 430A.

(c) The representations and warranties of the Company contained in this Agreement and in the certificates delivered pursuant to Section 3(d) shall be true and correct when made and on and as of each Closing Date as if made on such date. The Company shall have performed all covenants and agreements and satisfied all the conditions contained in this Agreement required to be performed or satisfied by it at or before each Closing Date.

(d) The Representative shall have received on each Closing Date a certificate, addressed to the Representative and dated as of the respective Closing Date, of the chief executive or chief operating officer and the chief financial officer or chief accounting officer of the Company to the effect that: (i) the representations, warranties and agreements of the Company in this Agreement were true and correct when made and are true and correct as of such Closing Date; (ii) the Company has performed all covenants and agreements and satisfied all conditions contained herein; (iii) they have carefully examined the Registration Statement, the Prospectus, the General Disclosure Package, and any individual Issuer Free Writing Prospectus and, in their opinion (A) as of the Effective Date the Registration Statement and Prospectus did not include, and as of the Applicable Time, neither (i) the General Disclosure Package, nor (ii) any individual Issuer Free Writing Prospectus, when considered together with the General Disclosure Package, included any untrue statement of a material fact and did not omit to state a material fact required to be stated therein or necessary to make the statements therein, in light of the circumstances under which they were made, not misleading, and (B) since the Effective Date, no event has occurred which should have been set forth in a supplement or otherwise required an amendment to the Registration Statement, the Statutory Prospectus or the Prospectus; (iv) no stop order suspending the effectiveness of the Registration Statement has been issued and, to their knowledge, no proceedings for that purpose have been instituted or are pending under the Securities Act and (v) there has not occurred any Material Adverse Effect.

(e) The Representative shall have received: (i) simultaneously with the execution of this Agreement, a signed letter from the Auditor addressed to the Representative and dated the date of this Agreement, in form and substance reasonably satisfactory to the Representative, containing

statements and information of the type ordinarily included in accountants' "comfort letters" to underwriters with respect to the financial statements and certain financial information contained in the Registration Statement and the General Disclosure Package, and (ii) on each Closing Date, a signed letter from the Auditor addressed to the Representative and dated the date of the respective Closing Date, in form and substance reasonably satisfactory to the Representative containing statements and information of the type ordinarily included in accountants' "comfort letters" to underwriters with respect to the financial statements and certain financial information contained in the Registration Statement and the Prospectus.

(f) The Representative shall have received on each Closing Date from Dorsey & Whitney LLP, U.S. counsel for the Company, an opinion and a negative assurance letter, addressed to the Representative and dated as of such Closing Date, in form and substance reasonably satisfactory to the Representative.

(g) The Representative shall have received on each Closing Date from McCarthy Tétrault LLP, Canadian counsel for the Company, an opinion, addressed to the Representative and dated as of such Closing Date, in form and substance reasonably satisfactory to the Representative.

(h) The Representative shall have received on each Closing Date from Cooley LLP, intellectual property counsel to the Company, an opinion, addressed to the Representative and dated as of such Closing Date, in form and substance reasonably satisfactory to the Representative.

(i) The Representative shall have received on each Closing Date from Mintz, Levin, Cohn, Ferris, Glovsky and Popeo, P.C., counsel for the Representative, a negative assurance statement, addressed to the Representative and dated as of such Closing Date, with respect to such matters as the Representative may reasonably require, and the Company shall have furnished or provided access to such counsel of such documents as they request for enabling them to pass upon such matters.

(j) All proceedings taken in connection with the sale of the Securities as herein contemplated shall be reasonably satisfactory in form and substance to the Representative and its counsel.

(k) The Representative shall have received copies of the Lock-up Agreements executed by each entity or person listed on Schedule II hereto.

(l) The Company shall apply to list or quote and promptly secure the listing of all of the Common Shares, including the Warrant Shares, sold pursuant to this Agreement on the Nasdaq Capital Market. The Company has taken no action to, or likely to have the effect of, delisting the Common Shares, nor has the Company received any notification that the Nasdaq Capital Market is contemplating terminating such listing.

(m) The Representative shall be reasonably satisfied that since the respective dates as of which information is given in the Registration Statement, the Statutory Prospectus, the General Disclosure Package and the Prospectus, (i) there shall not have been any material change in the capital stock of the Company or any material change in the indebtedness (other than in the ordinary course of business) of the Company, (ii) except as set forth or contemplated by the Registration Statement, the Statutory Prospectus, the General Disclosure Package or the Prospectus, no material

oral or written agreement or other transaction shall have been entered into by the Company that is not in the ordinary course of business or that would result in a material reduction in the future earnings of the Company, (iii) no loss or damage (whether or not insured) to the property of the Company shall have been sustained that had or would have a Material Adverse Effect, (iv) no legal or governmental action, suit or proceeding affecting the Company or any of its properties that is material to the Company or that affects or could affect the transactions contemplated by this Agreement shall have been instituted or threatened and (v) there shall not have been any material change in the assets, properties, condition (financial or otherwise), or in the results of operations, business affairs or business prospects of the Company or its subsidiaries considered as a whole that makes it impractical or inadvisable in the Representative's judgment to proceed with the purchase or offering of the Securities as contemplated hereby.

(n) FINRA shall have confirmed that it has not raised any objection with respect to the fairness and reasonableness of the underwriting terms and agreements in connection with the offering of the Securities.

(o) The Company shall have furnished or caused to be furnished to the Representative such further certificates or documents as the Representative shall have reasonably requested.

4. Covenants and other Agreements of the Company and the Underwriters.

(a) The Company covenants and agrees as follows:

(i) The Company will use its best efforts to cause the Registration Statement, if not effective at the time of execution of this Agreement, and any amendments thereto, to become effective as promptly as possible. The Company shall prepare the Prospectus in a form approved by the Representative and file such Prospectus pursuant to Rule 424(b) under the Securities Act not later than the Commission's close of business on the second business day following the execution and delivery of this Agreement, or, if applicable, such earlier time as may be required by the Rules. The Company will file with the Commission all Issuer Free Writing Prospectuses in the time and manner required under Rules 433(d) or 163(b)(2), as the case may be.

(ii) The Company shall promptly advise the Representative in writing (A) when any post-effective amendment to the Registration Statement shall have become effective or any supplement to the Prospectus shall have been filed, (B) of any request by the Commission for any amendment of the Registration Statement or the Prospectus or for any additional information, (C) of the issuance by the Commission of any stop order suspending the effectiveness of the Registration Statement or of any order preventing or suspending the use of any preliminary prospectus or any "free writing prospectus", as defined in Rule 405 of the Rules, or the institution or threatening of any proceeding for that purpose and (D) of the receipt by the Company of any notification with respect to the suspension of the qualification of the Securities for sale in any jurisdiction or the initiation or threatening of any proceeding for such purpose. The Company shall not file any amendment of

the Registration Statement or supplement to the Prospectus or any document incorporated by reference in the Registration Statement or any Issuer Free Writing Prospectus unless the Company has furnished the Representative a copy for its review prior to filing and shall not file any such proposed amendment or supplement to which the Representative reasonably objects. The Company shall use its best efforts to prevent the issuance of any such stop order and, if issued, to obtain as soon as possible the withdrawal thereof.

(iii) If, at any time when a prospectus relating to the Securities (or, in lieu thereof, the notice referred to in Rule 173(a) of the Rules) is required to be delivered under the Securities Act and any event occurs as a result of which the Prospectus as then amended or supplemented would include any untrue statement of a material fact or omit to state any material fact necessary to make the statements therein in the light of the circumstances under which they were made not misleading, or if it shall be necessary to amend or supplement the Prospectus to comply with the Securities Act or the Rules or the Exchange Act and the rules and regulations of the Commission thereunder, the Company promptly shall prepare and file with the Commission, subject to the second sentence of paragraph (ii) of this Section 4(a), an amendment or supplement which shall correct such statement or omission or an amendment which shall effect such compliance.

(iv) If at any time following issuance of an Issuer Free Writing Prospectus there occurs an event or development as a result of which such Issuer Free Writing Prospectus would conflict with the information contained in the Registration Statement or would include an untrue statement of a material fact or would omit to state a material fact required to be stated therein or necessary in order to make the statements therein, in the light of the circumstances prevailing at the subsequent time, not misleading, the Company will promptly notify the Representative and will promptly amend or supplement, at its own expense, such Issuer Free Writing Prospectus to eliminate or correct such conflict, untrue statement or omission.

(v) The Company shall make generally available to its security holders and to the Representative as soon as practicable, but not later than forty-five (45) days after the end of the 12-month period beginning at the end of the fiscal quarter of the Company during which the Effective Date occurs (or ninety (90) days if such 12-month period coincides with the Company's fiscal year), an earning statement (which need not be audited) of the Company, covering such 12-month period, which shall satisfy the provisions of Section 11(a) of the Securities Act or Rule 158 of the Rules.

(vi) The Company shall furnish to the Representative and counsel for the Underwriters, without charge, signed copies of the Registration Statement (including all exhibits thereto and amendments thereof) and to each other Underwriter a copy of the Registration Statement (without exhibits thereto) and all amendments thereof and, so long as delivery of a prospectus by

an Underwriter or dealer may be required by the Securities Act or the Rules, as many copies of any Preliminary Prospectus, any Issuer Free Writing Prospectus and the Prospectus and any amendments thereof and supplements thereto as the Representative may reasonably request. If applicable, the copies of the Registration Statement, Preliminary Prospectus, any Issuer Free Writing Prospectus and Prospectus and each amendment and supplement thereto furnished to the Underwriters will be identical to the electronically transmitted copies thereof filed with the Commission pursuant to EDGAR, except to the extent permitted by Regulation S-T.

(vii) The Company shall cooperate with the Representative and their counsel in endeavoring to qualify the Securities for offer and sale in connection with the offering under the laws of such jurisdictions as the Representative may designate and shall maintain such qualifications in effect so long as required for the distribution of the Securities; provided, however, that the Company shall not be required in connection therewith, as a condition thereof, to qualify as a foreign corporation or to execute a general consent to service of process in any jurisdiction or subject itself to taxation as doing business in any jurisdiction.

(viii) The Company, during the period when the Prospectus (or in lieu thereof, the notice referred to in Rule 173(a) of the Rules) is required to be delivered under the Securities Act and the Rules or the Exchange Act and the rules and regulations of the Commission thereunder, will file all reports and other documents required to be filed with the Commission pursuant to Section 13, 14 or 15 of the Exchange Act within the time periods required by the Exchange Act and the regulations promulgated thereunder.

(ix) Without the prior written consent of the Representative, for a period of 90 days after the date of this Agreement ("Lock-Up Period"), the Company shall not issue, sell or register with the Commission (other than on Form S-8 or on any successor form), or otherwise dispose of, directly or indirectly, any equity securities of the Company (or any securities convertible into, exercisable for or exchangeable for equity securities of the Company), except for (i) the issuance of the Securities pursuant to the Registration Statement, (ii) the issuance of shares pursuant to the Company's existing equity incentive plan, employee stock option plan or bonus plan as described in the Registration Statement and the Prospectus, (iii) the issuance of Common Shares pursuant to the conversion of securities or the exercise of warrants, which securities or warrants are outstanding on the date hereof and described in the Registration Statement and the Prospectus; (iv) the adoption of a new equity incentive plan, and filing a registration statement on Form S-8 under the Securities Act to register the offer and sale of securities to be issued pursuant to such new equity incentive plan, and issue securities pursuant to such new equity incentive plan (including, without limitation, the issuance of Common Shares upon the exercise of options or other securities issued pursuant to such new equity incentive plan), provided that (1) such new equity incentive plan

satisfies the transaction requirements of General Instruction A.1 of Form S-8 under the Securities Act and (2) this clause shall not be available unless each recipient of Common Shares, or securities exchangeable or exercisable for or convertible into Common Shares, pursuant to such new equity incentive plan shall be contractually prohibited from selling, offering, disposing of or otherwise transferring any such shares or securities during the remainder of the Lock-Up Period; (v) the sale of shares pursuant to the Equity Distribution Agreement, dated December 9, 2022, between the Company and Jones Trading Institutional Services LLC, provided that such sales may not occur prior to 45 days following the date of this Agreement unless the price per share during such period equals or exceeds 125% of the Firm Price; (vi) the sale of shares pursuant to the Common Share Purchase Agreement, dated May 25, 2023, between the Company and Keystone Capital Partners, LLC, provided that such sales may not occur prior to 45 days following the date of this Agreement unless the price per share during such period equals or exceeds 125% of the Firm Price; and (vii) the sale of shares to Hanmi Pharmaceutical, Inc. pursuant to the agreements between the Company and Hanmi Pharmaceutical, Inc. in effect of the date hereof, provided that the subscription price paid by Hanmi Pharmaceutical, Inc. equals or exceeds the Firm Price.

(x) On or before completion of this offering, the Company shall make all filings required under applicable securities laws and by Nasdaq (including any required registration under the Exchange Act).

(xi) Prior to the Closing Date, the Company will issue no press release or other communications directly or indirectly and hold no press conference with respect to the Company, the condition, financial or otherwise, or the earnings, business affairs or business prospects of any of them, or the offering of the Securities without the prior written consent of the Representative unless in the judgment of the Company and its counsel, and after notification to the Representative, such press release or communication is required by law.

(xii) The Company will apply the net proceeds from the offering of the Securities in the manner set forth under "Use of Proceeds" in the Prospectus.

(xiii) The Company will promptly notify the Representative if the Company ceases to be an Emerging Growth Company at any time prior to the later of (a) completion of the distribution of the Securities within the meaning of the Securities Act and (b) completion of the 90-day restricted period referred to in Section 4(a)(ix) hereof.

(xiv) If at any time following the distribution of any Written Testing-the-Waters Communication there occurred or occurs an event or development as a result of which such Written Testing-the-Waters Communication included or would include an untrue statement of a material fact or omitted or would omit to state a material fact necessary in order to make the statements therein, in the light of the circumstances existing at that subsequent time, not misleading, the Company will promptly notify the Representative and will promptly amend or supplement, at its own expense, such Written Testing-the-Waters Communication to eliminate or correct such untrue statement or omission.

(b) The Company agrees to pay, or reimburse if paid by the Representative, whether or not the transactions contemplated hereby are consummated or this Agreement is terminated, all costs and expenses incident to the public offering of the Securities and the performance of the

obligations of the Company under this Agreement including those relating to: (i) the preparation, printing, reproduction filing and distribution of the Registration Statement including all exhibits thereto, each Preliminary Prospectus, the Prospectus, any Issuer Free Writing Prospectus, all amendments and supplements thereto and any document incorporated by reference therein, and the printing, filing and distribution of this Agreement; (ii) the preparation and delivery of the Securities to the Underwriters; (iii) the furnishing (including costs of shipping and mailing) to the Representative and to the Underwriters of copies of each Preliminary Prospectus, the Prospectus and all amendments or supplements to the Prospectus, any Issuer Free Writing Prospectus, and of the several documents required by this Section 4 to be so furnished, as may be reasonably requested for use in connection with the offering and sale of the Securities by the Underwriters or by dealers to whom Securities may be sold; (iv) inclusion of the Shares and Warrant Shares for quotation on Nasdaq; (v) all transfer taxes, if any, with respect to the sale and delivery of the Securities by the Company to the Underwriters; and (vi) all reasonable out-of-pocket costs and expenses incident to the offering and the performance of the obligations of the Representative under this Agreement (including, without limitation, the fees and expenses of counsel to the Underwriters) not to exceed \$125,000 in the aggregate (without the Company's prior approval and for certainty, such \$125,000 shall be inclusive of the fees and expenses of counsel to the Underwriters for services provided to any prior proposed underwriter for an offering of securities by the Company), excluding (x) the registration or qualification of the Shares and Warrant Shares for offer and sale under the securities or Blue Sky laws of the various jurisdictions referred to in Section 4(a)(vi), including the reasonable fees and disbursements of counsel for the Underwriters in connection with such registration and qualification and the preparation, printing, distribution and shipment of preliminary and supplementary Blue Sky memoranda and (y) the filing fees of FINRA in connection with its review of the terms of the public offering and reasonable fees and disbursements of counsel for the Underwriters in connection with such review. The Underwriters agree to pay, whether or not the transactions contemplated hereby are consummated or this Agreement is terminated, all costs and expenses incident to the performance of the obligations of the Underwriters under this Agreement not payable by the Company pursuant to the preceding sentence, including, without limitation, the fees and disbursements of counsel for the Underwriters.

(c) The Company acknowledges and agrees that each of the Underwriters has acted and is acting solely in the capacity of a principal in an arm's length transaction between the Company, on the one hand, and the Underwriters, on the other hand, with respect to the offering of Securities contemplated hereby (including in connection with determining the terms of the offering) and not as a financial advisor, agent or fiduciary to the Company or any other person, and that the Underwriters may have interests that differ from those of the Company. Additionally, the Company acknowledges and agrees that the Underwriters have not and will not advise the Company or any other person as to any legal, tax, investment, accounting or regulatory matters in

any jurisdiction. The Company has consulted with its own advisors concerning such matters and shall be responsible for making its own independent investigation and appraisal of the transactions contemplated hereby, and the Underwriters shall have no responsibility or liability to the Company or any other person with respect thereto, whether arising prior to or after the date hereof. Any review by the Underwriters of the Company, the transactions contemplated hereby or other matters relating to such transactions have been and will be performed solely for the benefit of the Underwriters and shall not be on behalf of the Company. The Company agrees that it will not claim that the Underwriters, or any of them, has rendered advisory services of any nature or respect, or owes a fiduciary duty to the company or any other person in connection with any such transaction or the process leading thereto.

(d) The Company represents and agrees that, unless it obtains the prior consent of the Representative, and each Underwriter represents and agrees that, unless it obtains the prior consent of the Company and the Representative, it has not made and will not make any offer relating to the Securities that would constitute an "issuer free writing prospectus," as defined in Rule 433, or that would otherwise constitute a "free writing prospectus," as defined in Rule 405, required to be filed with the Commission. The Company has complied and will comply with the requirements of Rule 433 under the Securities Act applicable to any Issuer Free Writing Prospectus, including timely filing with the Commission where required, legending and record keeping. The Company represents that it has satisfied and agrees that it will satisfy the conditions set forth in Rule 433 of the Rules to avoid a requirement to file with the Commission any Road Show.

5. Indemnification.

(a) The Company agrees to indemnify and hold harmless each Underwriter, its officers and employees and each person, if any, who controls any Underwriter within the meaning of Section 15 of the Securities Act or Section 20 of the Exchange Act against any and all losses, claims, damages and liabilities, joint or several (including any reasonable investigation, legal and other expenses incurred in connection with, and any amount paid in settlement of, any action, suit or proceeding or any claim asserted), to which they, or any of them, may become subject under the Securities Act, the Exchange Act or other federal or state law or regulation, at common law or otherwise, insofar as such losses, claims, damages or liabilities arise, directly or indirectly, in connection with, out of or are based upon i) any untrue statement or alleged untrue statement of a material fact contained in any preliminary prospectus, the Registration Statement, the Statutory Prospectus, the Prospectus, any Issuer Free Writing Prospectus or any "issuer-information" filed or required to be filed pursuant to Rule 433(d) of the Rules, any amendment thereof or supplement thereto, any Written Testing-the-Waters Communication, or in any Blue Sky application or other information or other documents executed by the Company filed in any state or other jurisdiction to qualify any or all of the Securities under the securities laws thereof (any such application, document or information being hereinafter referred to as a "Blue Sky Application"), ii) any omission or alleged omission to state therein a material fact required to be stated therein or necessary to make the statements therein not misleading, or iii) any actual or alleged breach by the Company of any of its obligations, or of any of its representations, warranties and undertakings, set out in this Agreement; provided, however, that such indemnity shall not inure to the benefit of any Underwriter (or any person controlling such Underwriter) on account of any losses, claims, damages or liabilities arising from the sale of the Securities to any person by such Underwriter if such untrue statement or omission or alleged untrue statement or omission was made in such

preliminary prospectus, the Registration Statement, the Prospectus, the Statutory Prospectus, any Issuer Free Writing Prospectus or such amendment or supplement thereto, any Written Testing-the-Waters Communication, or in any Blue Sky Application in reliance upon and in conformity with the Underwriter Information. This indemnity agreement will be in addition to any liability which the Company may otherwise have.

(b) Each Underwriter, severally and not jointly, agrees to indemnify and hold harmless the Company, and each person, if any, who controls the Company within the meaning of Section 15 of the Securities Act or Section 20 of the Exchange Act, each director of the Company, and each officer of the Company who signs the Registration Statement, against any losses, claims, damages or liabilities to which such party may become subject, under the Securities Act or otherwise, insofar as such losses, claims, damages or liabilities (or actions in respect thereof) arise out of or are based upon an untrue statement or alleged untrue statement of a material fact contained in any preliminary prospectus, the Registration Statement or the Prospectus, or any amendment or supplement thereto, or arise, directly or indirectly, in connection with, out of or are based upon the omission or alleged omission to state therein a material fact required to be stated therein or necessary to make the statements therein not misleading, in each case to the extent, but only to the extent, that such untrue statement or alleged untrue statement or omission or alleged omission was made in any Preliminary Prospectus, the Registration Statement, the Statutory Prospectus or the Prospectus or any such amendment or supplement in reliance upon and in conformity with the Underwriter Information; provided, however, that the obligation of each Underwriter to indemnify the Company (including any controlling person, director or officer thereof) shall be limited to the amount of the underwriting discount and commissions applicable to the Securities to be purchased by such Underwriter hereunder.

(c) Any party that proposes to assert the right to be indemnified under this Section 5 will, promptly after receipt of notice of commencement of any action, suit or proceeding against such party in respect of which a claim is to be made against an indemnifying party or parties under this Section 5, notify each such indemnifying party in writing of the commencement of such action, suit or proceeding, enclosing a copy of all papers served. No indemnification provided for in Section 5(a) or 5(b) shall be available to any party who shall fail to give notice as provided in this Section 5(c) if the party to whom notice was not given was unaware of the action, suit or proceeding to which such notice would have related and was prejudiced by the failure to give such notice but the omission so to notify such indemnifying party of any such action, suit or proceeding shall not relieve it from any liability that it may have to any indemnified party for contribution or otherwise than under this Section 5. In case any such action, suit or proceeding shall be brought against any indemnified party and it shall notify the indemnifying party of the commencement thereof, the indemnifying party shall be entitled to participate in, and, to the extent that it shall wish, jointly with any other indemnifying party similarly notified, to assume the defense thereof, with counsel reasonably satisfactory to such indemnified party, and after notice from the indemnifying party to such indemnified party of its election so to assume the defense thereof and the approval by the indemnified party of such counsel, the indemnifying party shall not be liable to such indemnified party for any legal or other expenses, except as provided below and except for the reasonable costs of investigation subsequently incurred by such indemnified party in connection with the defense thereof. The indemnified party shall have the right to employ its counsel in any such action, but the fees and expenses of such counsel shall be at the expense of such indemnified party unless (i) the employment of counsel by such indemnified party has been

authorized in writing by the indemnifying parties, (ii) the indemnified party shall have been advised by counsel that there may be one or more legal defenses available to it which are different from or in addition to those available to the indemnifying party (in which case the indemnifying parties shall not have the right to direct the defense of such action on behalf of the indemnified party) or (iii) the indemnifying parties shall not have employed counsel to assume the defense of such action within a reasonable time after notice of the commencement thereof, in each of which cases the fees and expenses of counsel shall be at the expense of the indemnifying parties. An indemnifying party shall not be liable for any settlement of any action, suit, and proceeding or claim effected without its written consent, which consent shall not be unreasonably withheld or delayed. No indemnifying party shall settle any action, suit or proceeding for which indemnification or contribution is or would have been available hereunder to an indemnified person that was or could have been made party thereto without obtaining a release in favor of each such indemnified person from all claims brought in or arising from such action, suit or proceeding.

6. Contribution. In order to provide for just and equitable contribution in circumstances in which the indemnification provided for in Section 5(a) or 5(b) is due in accordance with its terms but for any reason is unavailable to or insufficient to hold harmless an indemnified party in respect to any losses, liabilities, claims, damages or expenses referred to therein, then each indemnifying party shall contribute to the aggregate losses, liabilities, claims, damages and expenses (including any investigation, legal and other expenses reasonably incurred in connection with, and any amount paid in settlement of, any action, suit or proceeding or any claims asserted, but after deducting any contribution received by any person entitled hereunder to contribution from any person who may be liable for contribution) incurred by such indemnified party, as incurred, in such proportion as is appropriate to reflect the relative benefits received by the Company on the one hand and the Underwriters on the other hand from the offering of the Securities pursuant to this Agreement or, if such allocation is not permitted by applicable law, in such proportion as is appropriate to reflect not only the relative benefits referred to above but also the relative fault of the Company on the one hand and the Underwriters on the other hand in connection with the statements or omissions which resulted in such losses, liabilities, claims, damages or expenses, as well as any other relevant equitable considerations. The Company and the Underwriters agree that it would not be just and equitable if contribution pursuant to this Section 6 were determined by pro rata allocation (even if the Underwriters were treated as one entity for such purpose) or by any other method of allocation which does not take account of the equitable considerations referred to above. The aggregate amount of losses, liabilities, claims, damages and expenses incurred by an indemnified party and referred to above shall be deemed to include any legal or other expenses reasonably incurred by such indemnified party in investigating, preparing or defending against any litigation, or any investigation or proceeding by any governmental agency or body, commenced or threatened, or any claim whatsoever based upon any such untrue or alleged untrue statement or omission or alleged omission. Notwithstanding the provisions of this Section 6, no Underwriter (except as may be provided in any agreement among Underwriters) shall be required to contribute any amount in excess of the underwriting discounts and commissions applicable to the Securities purchased by such Underwriter. No person guilty of fraudulent misrepresentation (within the meaning of Section 11(f) of the Securities Act) shall be entitled to contribution from any person who was not guilty of such fraudulent misrepresentation. For purposes of this Section 6, each person, if any, who controls an Underwriter within the meaning of Section 15 of the Securities Act or Section 20 of the Exchange Act shall have the same rights to contribution as such Underwriter, and each director of the Company, each officer of the

Company who signed the Registration Statement, and each person, if any, who controls the Company within the meaning of the Section 15 of the Securities Act or Section 20 of the Exchange Act, shall have the same rights to contribution as the Company. Any party entitled to contribution will, promptly after receipt of notice of commencement of any action, suit or proceeding against such party in respect of which a claim for contribution may be made against another party or parties under this Section 6, notify such party or parties from whom contribution may be sought, but the omission so to notify such party or parties from whom contribution may be sought shall not relieve the party or parties from whom contribution may be sought from any other obligation it or they may have hereunder or otherwise than under this Section 6. No party shall be liable for contribution with respect to any action, suit, proceeding or claim settled without its written consent. The Underwriters' obligations to contribute pursuant to this Section 6 are several in proportion to their respective underwriting commitments and not joint.

7. Termination.

(a) This Agreement may be terminated with respect to the Securities to be purchased on the Firm Securities Closing Date by the Representative by notifying the Company at any time at or before the Firm Securities Closing Date in the absolute discretion of the Representative if: (i) there has occurred any material adverse change in the securities markets or any event, act or occurrence that has materially disrupted, or in the opinion of the Representative, will in the future materially disrupt, the securities markets or there shall be such a material adverse change in general financial, political or economic conditions or the effect of international conditions on the financial markets in the United States is such as to make it, in the judgment of the Representative, inadvisable or impracticable to market the Securities or enforce contracts for the sale of the Securities; (ii) there has occurred any outbreak or material escalation of hostilities or acts of terrorism or other calamity or crisis the effect of which on the financial markets of the United States is such as to make it, in the judgment of the Representative, inadvisable or impracticable to market the Securities or enforce contracts for the sale of the Securities; (iii) trading in the Securities or any securities of the Company has been suspended or materially limited by the Commission or trading generally on the New York Stock Exchange, Inc. or the Nasdaq Stock Market has been suspended or materially limited, or minimum or maximum ranges for prices for securities shall have been fixed, or maximum ranges for prices for securities have been required, by any of said exchanges or by such system or by order of the Commission, FINRA, or any other governmental or regulatory authority; (iv) a banking moratorium has been declared by any state or federal authority; (v) in the judgment of the Representative, there has been, since the time of execution of this Agreement or since the respective dates as of which information is given in the Prospectus, any material adverse change in the assets, properties, condition, financial or otherwise, or in the results of operations, business affairs or business prospects of the Company and its subsidiaries considered as a whole, whether or not arising in the ordinary course of business; (vi) the representations and warranties given by the Company in this Agreement have ceased to be true and accurate in all material respects; or (vii) there has been a material breach by the Company of any of the covenants contained in this Agreement.

(b) If this Agreement is terminated pursuant to any of its provisions, the Company shall not be under any liability to any Underwriter, and no Underwriter shall be under any liability to the Company, except that (y) if this Agreement is terminated by the Representative or the Underwriters because of any failure, refusal or inability on the part of the Company to comply

with the terms or to fulfill any of the conditions of this Agreement, the Company will reimburse the Underwriters for all out-of-pocket expenses (including the reasonable fees and disbursements of their counsel) incurred by them in connection with the proposed purchase and sale of the Securities or in contemplation of performing their obligations hereunder and (z) no Underwriter who shall have failed or refused to purchase the Securities agreed to be purchased by it under this Agreement, without some reason sufficient hereunder to justify cancellation or termination of its obligations under this Agreement, shall be relieved of liability to the Company or to the other Underwriters for damages occasioned by its failure or refusal.

8. Substitution of Underwriters. If any Underwriter shall default in its obligation to purchase on any Closing Date the Securities agreed to be purchased hereunder on such Closing Date, the Representative shall have the right, within thirty-six (36) hours thereafter, to make arrangements for one or more of the non-defaulting Underwriters, or any other underwriters, to purchase such Securities on the terms contained herein. If, however, the Representative shall not have completed such arrangements within such 36-hour period, then the Company shall be entitled to a further period of thirty-six (36) hours within which to procure another party or other parties satisfactory to the Underwriters to purchase such Securities on such terms. If, after giving effect to any arrangements for the purchase of the Securities of a defaulting Underwriter or Underwriters by the Representative and the Company as provided above, the aggregate number of Securities which remains unpurchased on the Closing Date does not exceed one-eleventh ($1/11$) of the aggregate number of all the Securities that all the Underwriters are obligated to purchase on such date, then the Company shall have the right to require each non-defaulting Underwriter to purchase the number of Securities which such Underwriter agreed to purchase hereunder at such date and, in addition, to require each non-defaulting Underwriter to purchase its pro rata share (based on the number of Securities which such Underwriter agreed to purchase hereunder) of the Securities of such defaulting Underwriter or Underwriters for which such arrangements have not been made; but nothing herein shall relieve a defaulting Underwriter from liability for its default. In any such case, either the Representative or the Company shall have the right to postpone the Closing Date for a period of not more than seven (7) days in order to effect any necessary changes and arrangements (including any necessary amendments or supplements to the Registration Statement or Prospectus or any other documents), and the Company agrees to file promptly any amendments to the Registration Statement or the Prospectus which in the opinion of the Company and the Underwriters and their counsel may thereby be made necessary.

If, after giving effect to any arrangements for the purchase of the Securities of a defaulting Underwriter or Underwriters by the Representative and the Company as provided above, the aggregate number of such Securities which remains unpurchased exceeds 10% of the aggregate number of all the Securities to be purchased at such date, then this Agreement shall terminate, without liability on the part of any non-defaulting Underwriter to the Company, and without liability on the part of the Company, except as provided in Sections 4(b), 5, 6 and 7. The provisions of this Section 8 shall not in any way affect the liability of any defaulting Underwriter to the Company or the nondefaulting Underwriters arising out of such default. The term "Underwriter" as used in this Agreement shall include any person substituted under this Section 8 with like effect as if such person had originally been a party to this Agreement with respect to such Securities.

9. Miscellaneous. The respective agreements, representations, warranties, indemnities and other statements of the Company and the several Underwriters, as set forth in this Agreement or made by or on behalf of them pursuant to this Agreement, shall remain in full force and effect, regardless of any investigation (or any statement as to the results thereof) made by or on behalf of any Underwriter or the Company or any of their respective officers, directors or controlling persons referred to in Sections 5 and 6 hereof, and shall survive delivery of and payment for the Securities. In addition, the provisions of Sections 4(b), 5, 6 and 7 shall survive the termination or cancellation of this Agreement.

This Agreement has been and is made for the benefit of the Underwriters, the Company, the indemnified persons and their respective successors and assigns, and, to the extent expressed herein, for the benefit of persons controlling any of the Underwriters, or the Company, and directors and officers of the Company, and their respective successors and assigns, and no other person shall acquire or have any right under or by virtue of this Agreement. The term "successors and assigns" shall not include any purchaser of Securities from any Underwriter merely because of such purchase.

All notices and communications hereunder shall be in writing and mailed or delivered or by telephone or facsimile if subsequently confirmed in writing, (a) if to the Representative, c/o Newbridge Securities Corporation, 1200 North Federal Highway, Suite 400, Boca Raton, FL 33432, Attention: Robert Abrams, General Counsel, and to Mintz, Levin, Cohn, Ferris, Glovsky and Popeo, P.C., 919 Third Avenue, New York, New York 10022, Attention: Ivan K. Blumenthal, Esq., and (b) if to the Company, to its agent for service as such agent's address appears on the cover page of the Registration Statement with copies to Dorsey & Whitney LLP, 1095 West Pender Street, Suite 1070, Vancouver, BC V6E 2M6, Attention: Daniel M. Miller.

This Agreement shall be governed by and construed in accordance with the internal laws of the State of New York applicable to agreements made and to be performed in such state.

[Remainder of Page Intentionally Left Blank. Signature Page Follows.]

This Agreement may be signed in any number of counterparts, each of which shall be an original, with the same effect as if the signatures thereto and hereto were upon the same instrument.

Please confirm that the foregoing correctly sets forth the agreement among us.

Very truly yours,

APTOSE BIOSCIENCES INC.

By: _____
Name:
Title:

Confirmed:

NEWBRIDGE SECURITIES CORPORATION

By: _____
Name:
Title:

Acting severally on behalf of itself
and as representative of the several
Underwriters named in Schedule I annexed
hereto.

[Signature Page to Underwriting Agreement]

SCHEDULE I

<u>Name</u>	<u>Number of Shares to Be Purchased</u>	<u>Number of Pre-Funded Warrants to Be Purchased</u>	<u>Number of Common Warrants to Be Purchased</u>
Newbridge Securities Corporation			
Total			

SCHEDULE II

Lock-up Signatories

Dr. William G. Rice
Dr. Rafael Bejar
Philippe Ledru
Fletcher Payne
Carol G. Ashe
Dr. Denis Burger
Dr. Erich Platzer
Dr. Mark D. Vincent
Warren Whitehead
Dr. Bernd R. Seizinger

SCHEDULE III

Issuer Free Writing Prospectuses

None.

SCHEDULE IV

Testing-the-Waters Communications

Testing-the-Waters presentation dated

FORM OF PRE-FUNDED WARRANT

Included as Exhibit 4.3 to the Registration Statement on Form S-1

FORM OF COMMON WARRANT

Included as Exhibit 4.2 to the Registration Statement on Form S-1

Form of Lock-Up Agreement

____, 2023

Oppenheimer & Co. Inc.
85 Broad Street
New York, NY 10004

Re: Proposed Offering by Aptose Biosciences Inc.

Ladies and Gentlemen:

This letter agreement (“this Agreement”) is being delivered to you in connection with the proposed offering (the “Offering”) by Aptose Biosciences Inc., a corporation organized and existing under the laws of Canada (the “Company”), of its securities (the “Securities”), including common shares, no par value (the “Common Shares”), pursuant to the proposed Underwriting Agreement (the “Underwriting Agreement”) to be entered into between the Company and the several underwriters identified therein (each, including its successors and assigns, an “Underwriter” and collectively, the “Underwriters”).

In order to induce the Underwriters to enter into the Underwriting Agreement, and in light of the benefits that the Offering will confer upon the undersigned in his, her or its capacity as a securityholder and/or an officer, director or employee of the Company, and for good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the undersigned agrees with Oppenheimer & Co. Inc. (the “Representative”), that, during the period beginning on the date hereof through and including the date that is the 90th day after the date of the Underwriting Agreement (the “Lock-Up Period”), the undersigned will not, without the prior written consent of the Representative, directly or indirectly, (i) offer, sell, assign, transfer, pledge, contract to sell, or otherwise dispose of (or announce the intention to otherwise dispose of), any Common Shares (including, without limitation, Common Shares which may be deemed to be beneficially owned by the undersigned in accordance with the rules and regulations promulgated under the Securities Act of 1933, as amended (such shares, the “Beneficially Owned Shares” and such act the “Securities Act”)) or securities convertible into or exercisable or exchangeable for Common Shares, (ii) enter into any swap, hedge or similar agreement or arrangement that transfers to another, in whole or in part, the economic consequences of ownership of the Beneficially Owned Shares or securities convertible into or exercisable or exchangeable for Common Shares, whether now owned or hereafter acquired by the undersigned or with respect to which the undersigned has or hereafter acquires the power of disposition, or (iii) engage in any short selling of the Common Shares or securities convertible into or exercisable or exchangeable for Common Shares.

The restrictions set forth in the immediately preceding paragraph shall not apply to:

- (1) transactions relating to Common Shares acquired in open market transactions after the completion of the Offering of Securities acquired in the Offering, *provided* that no public

announcement or filing under Section 16(a) of the Securities Exchange Act of 1934, as amended (the "Exchange Act") shall be required or voluntarily made in connection therewith,

- (2) if the undersigned is a natural person, any transfers made by the undersigned (a) as a bona fide gift to any member of the immediate family (as defined below) of the undersigned or to a trust the beneficiaries of which are exclusively the undersigned or members of the undersigned's immediate family, (b) by will or intestate succession upon the death of the undersigned or (c) as a bona fide gift to a charity or educational institution,
- (3) if the undersigned is a corporation, partnership, limited liability company or other business entity, any transfers to any shareholder, partner or member of, or owner of a similar equity interest in, the undersigned, as the case may be, if, in any such case, such transfer is not for value,
- (4) if the undersigned is a corporation, partnership, limited liability company or other business entity, any transfer made by the undersigned (a) in connection with the sale or other bona fide transfer in a single transaction of all or substantially all of the undersigned's capital stock, partnership interests, membership interests or other similar equity interests, as the case may be, or all or substantially all of the undersigned's assets, in any such case not undertaken for the purpose of avoiding the restrictions imposed by this agreement or (b) to another corporation, partnership, limited liability company or other business entity so long as the transferee is an affiliate (as defined below) of the undersigned and such transfer is not for value,
- (5) the exercise of an option to purchase Common Shares granted under an equity incentive plan or equity purchase plan of the Company described (including through incorporation by reference) in the prospectus relating to the Offering, the exercise or conversion of a warrant or other convertible security to purchase Common Shares described (including through incorporation by reference) in the prospectus relating to the Offering, provided that the underlying Common Shares continue to be subject to the restrictions set forth herein, or the receipt of restricted stock awards from the Company and disposition of shares of Common Shares to the Company pursuant to the terms of any such plan or awards to satisfy tax withholding obligations or the payment of taxes or any exercise price due with respect to the vesting of restricted stock awards or the cashless exercise of stock options or upon termination of employment with the Company,
- (6) sales to the Company in connection with the vesting or settlement of restricted stock units or the "net" or "cashless" exercise of options, warrants or other rights to purchase shares of Common Shares for purposes of exercising such options, warrants or rights, including any transfer for the payment of tax withholdings or remittance payments due as a result of the vesting, settlement, or exercise of such restricted stock units, options, warrants or other rights, so long as any such "net" or "cashless" exercise is effected solely by the surrender of outstanding options or warrants (or the Common Shares issuable upon the exercise thereof) to the Company and the Company's cancellation of all or a portion thereof to pay the exercise price and/or withholding tax and remittance obligations,

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- (7) sales to the Company pursuant to (A) any contractual arrangement in effect on the date of the Underwriting Agreement that provides for the repurchase of the undersigned's securities by the Company at the lower of cost or fair market value or (B) a right of first refusal that the Company has with respect to transfers of such securities, in each case upon termination of employment or service of the undersigned with the Company,
 - (8) by operation of law, such as pursuant to a qualified domestic order or in connection with a divorce settlement or any other court order or order of a regulatory agency,
 - (9) in connection with a transfer not involving a change in beneficial ownership, and
 - (10) the entry into a trading plan pursuant to Rule 10b5-1 (a "Rule 10b5-1 Plan") under the Exchange Act, so long as such plan is not publicly announced and no sales are made pursuant to such plan during the Lock-Up Period,

provided, however, (A) that in the case of any transfer described in clause (2), (3), (4), (8), or (9) above, it shall be a condition to the transfer that the transferee executes and delivers to the Representative, not later than one business day prior to such transfer, a written agreement, in substantially the form of this agreement (it being understood that any references to "immediate family" in the agreement executed by such transferee shall expressly refer only to the immediate family of the undersigned and not to the immediate family of the transferee) and otherwise satisfactory in form and substance to the Representative, and (B) that in the case of any transfer described in clause (2), (3), (4), (5), (6), (7), (8), or (9) above, it shall be a condition to the transfer that if the undersigned is required to file a report under Section 16(a) of the Exchange Act reporting a reduction in beneficial ownership of Common Shares or Beneficially Owned Shares or any securities convertible into or exercisable or exchangeable for Common Shares or Beneficially Owned Shares during the Lock-Up Period, the undersigned shall include a statement in such report to the effect that, in the case of any transfer pursuant to clause (2) above, such transfer is being made as a gift or by will or intestate succession or, in the case of any transfer pursuant to clause (3) above, such transfer is being made to a shareholder, partner or member of, or owner of a similar equity interest in, the undersigned and is not a transfer for value or, in the case of any transfer pursuant to clause (4) above, such transfer is being made either (a) in connection with the sale or other bona fide transfer in a single transaction of all or substantially all of the undersigned's capital stock, partnership interests, membership interests or other similar equity interests, as the case may be, or all or substantially all of the undersigned's assets or (b) to another corporation, partnership, limited liability company or other business entity that is an affiliate of the undersigned and such transfer is not for value or, in the case of any transfer pursuant to clause (5) above, such transfer is being made to the Company to satisfy tax withholding obligations or the payment of taxes or any exercise price due with respect to the vesting of restricted stock awards or the cashless exercise of stock options or upon termination of employment with the Company, in each case, as applicable, or, in the case of any transfer pursuant to clause (6) above, such transfer is being made for the payment of tax withholdings or remittance payments or, in the case of any transfer pursuant to clause (7) above, such transfer is being made under terms of the Company's repurchase rights or in connection with the termination of the undersigned or, in the case of any transfer pursuant to clause (8) above, such transfer is being made by operation of law to a qualified domestic order or

in connection with a divorce settlement or any other court order or order of a regulatory agency or, in the case of any transfer pursuant to clause (9) above, such transfer is being made in connection with a transfer not involving a change in beneficial ownership. For purposes of this paragraph, "immediate family" shall mean a spouse, child, grandchild or other lineal descendant (including by adoption), father, mother, brother or sister of the undersigned; and "affiliate" shall have the meaning set forth in Rule 405 under the Securities Act.

For avoidance of doubt, nothing in this Agreement prohibits (A) the undersigned from exercising any options or warrants to purchase Common Shares (which exercises may be effected on a cashless basis to the extent the instruments representing such options or warrants permit exercises on a cashless basis), it being understood that any Common Shares issued upon such exercises will be subject to the restrictions of this Agreement or (B) the surrender or forfeiture of securities in partial or full settlement of any income, employment or social tax withholding and remittance obligations of the undersigned or the employer of the undersigned in connection with the vesting or exercise of any equity award outstanding on the date of the Underwriting Agreement granted pursuant to the Company's equity plans described in the Prospectus, and provided, however, that no public announcement or filing is voluntarily made regarding such exercise during the Lock-Up Period and provided that if the undersigned is required to file a report under Section 16(a) of the Exchange Act reporting a reduction in beneficial ownership of such options or warrants during the Lock-Up Period, the undersigned shall include a statement in such report to the effect that the disposition relates to the exercise of an option or warrant, as applicable, and that the shares of Common Shares received upon exercise are subject to the restrictions of this Agreement.

In order to enable this covenant to be enforced, the undersigned hereby consents to the placing of legends or stop transfer instructions with the Company's transfer agent with respect to any Common Shares or securities convertible into or exercisable or exchangeable for Common Shares. The undersigned further agrees that (i) it will not, during the Lock-Up Period, make any demand or request for or exercise any right with respect to the registration under the Securities Act of any Common Shares or other Beneficially Owned Shares or any securities convertible into or exercisable or exchangeable for Common Shares or other Beneficially Owned Shares, and (ii) the Company may, with respect to any Common Shares or other Beneficially Owned Shares or any securities convertible into or exercisable or exchangeable for Common Shares or other Beneficially Owned Shares owned or held (of record or beneficially) by the undersigned, cause the transfer agent or other registrar to enter stop transfer instructions and implement stop transfer procedures with respect to such securities during the Lock-Up Period.

The undersigned hereby represents and warrants that the undersigned has full power and authority to enter into this agreement and that this agreement has been duly authorized (if the undersigned is not a natural person), executed and delivered by the undersigned and is a valid and binding agreement of the undersigned. This agreement and all authority herein conferred are irrevocable and shall survive the death or incapacity of the undersigned (if a natural person) and shall be binding upon the heirs, personal representatives, successors and assigns of the undersigned.

This agreement shall automatically terminate and the undersigned shall be released from all obligations under this agreement upon the earliest to occur, if any, of: (a) either the Company, on the one hand, or the Representative, on the other hand, advising the other in writing, prior to the

execution of the Underwriting Agreement, that they have determined not to proceed with the Offering, or (b) termination of the Underwriting Agreement (other than the provisions thereof which survive termination) prior to the closing of the Offering.

The undersigned acknowledges and agrees that whether or not any underwriting of Securities actually occurs depends on a number of factors, including market conditions.

[signature page follows]

Very truly yours,

(Name of Stockholder—Please Print)

(Signature)

(Name of Signatory if Stockholder is an entity — Please Print)

(Title of Signatory if Stockholder is an entity — Please Print)

Address: _____

Underwriter's Warrant Agreement

THE REGISTERED HOLDER OF THIS PURCHASE WARRANT BY ITS ACCEPTANCE HEREOF, AGREES THAT IT WILL NOT SELL, TRANSFER OR ASSIGN THIS PURCHASE WARRANT EXCEPT AS HEREIN PROVIDED AND THE REGISTERED HOLDER OF THIS PURCHASE WARRANT AGREES THAT IT WILL NOT SELL, TRANSFER, ASSIGN, PLEDGE OR HYPOTHECATE THIS PURCHASE WARRANT FOR A PERIOD OF ONE HUNDRED EIGHTY DAYS FOLLOWING THE EFFECTIVE DATE (DEFINED BELOW) TO ANYONE OTHER THAN (I) NEWBRIDGE SECURITIES CORPORATION OR AN UNDERWRITER OR A SELECTED DEALER IN CONNECTION WITH THE OFFERING, OR (II) A BONA FIDE OFFICER OR PARTNER OF NEWBRIDGE SECURITIES CORPORATION OR OF ANY SUCH UNDERWRITER OR SELECTED DEALER.

THIS PURCHASE WARRANT IS NOT EXERCISABLE PRIOR TO [•], 2024¹. VOID AFTER 5:00 P.M., EASTERN TIME, [•], 2028².

COMMON SHARE PURCHASE WARRANT

APTOSE BIOSCIENCES INC.

Warrant Shares: _____

Initial Issue Date: _____, 2024

Initial Exercise Date: _____, 2024

THIS COMMON SHARE PURCHASE WARRANT (the "**Warrant**") certifies that, for value received, [Newbridge Securities Corporation] [other designee] or its assigns (the "**Holder**") is entitled, upon the terms and subject to the limitations on exercise and the conditions hereinafter set forth, at any time on or after [•]³, 2023 (the "**Initial Exercise Date**") and, in accordance with FINRA Rule 5110(g)(8)(A), prior to 5:00 p.m. (New York City time) on the date that is four (4) years following the Initial Exercise Date (the "**Termination Date**") but not thereafter, to subscribe for and purchase from Aptose Biosciences Inc., a company incorporated under the Canada Business Corporations Act (the "**Company**"), up to [] common shares in the capital of the Company (as subject to adjustment hereunder, the "**Warrant Shares**"). The purchase price of one Common Share under this Warrant shall be equal to the Exercise Price, as defined in Section 2(b).

Section 1. Definitions. In addition to the terms defined elsewhere in this Warrant, the following terms have the meanings indicated in this Section 1:

"**Affiliate**" means any Person that, directly or indirectly through one or more intermediaries, controls or is controlled by or is under common control with a Person, as such terms are used in and construed under Rule 405 under the Securities Act.

¹ To be six months from the closing date for the base deal.

² To be four years from the Initial Exercise Date.

³ To be six months from the closing date for the base deal.

“**Bid Price**” means, for any date, the price determined by the first of the following clauses that applies: (a) if the Common Shares are then listed or quoted on a Trading Market, the bid price of the Common Shares for the time in question (or the nearest preceding date) on the Trading Market on which the Common Shares is then listed or quoted as reported by Bloomberg L.P. (based on a Trading Day from 9:30 a.m. (New York City time) to 4:02 p.m. (New York City time)), (b) if OTCQB or OTCQX is not a Trading Market, the volume weighted average price of the Common Shares for such date (or the nearest preceding date) on OTCQB or OTCQX as applicable, (c) if the Common Shares are not then listed or quoted for trading on OTCQB or OTCQX and if prices for the Common Shares are then reported on the Pink Open Market (or a similar organization or agency succeeding to its functions of reporting prices), the most recent bid price per share of the Common Shares so reported, or (d) in all other cases, the fair market value of a Common Share as determined in good faith by an independent appraiser selected in good faith by the Board of Directors of the Company, the fees and expenses of which shall be paid by the Company.

“**Business Day**” means any day other than Saturday, Sunday or other day on which commercial banks in The City of New York are authorized or required by law to remain closed; provided, however, for clarification, commercial banks shall not be deemed to be authorized or required by law to remain closed due to “stay at home”, “shelter-in-place”, “non-essential employee” or any other similar orders or restrictions or the closure of any physical branch locations at the direction of any governmental authority so long as the electronic funds transfer systems (including for wire transfers) of commercial banks in The City of New York generally are open for use by customers on such day.

“**Commission**” means the United States Securities and Exchange Commission.

“**Common Shares**” means the common shares of the Company, no par value per share, and any other class of securities into which such securities may hereafter be reclassified or changed.

“**Common Share Equivalents**” means any securities of the Company or the Subsidiaries which would entitle the holder thereof to acquire at any time Common Shares, including, without limitation, any debt, preferred share, right, option, warrant or other instrument that is at any time convertible into or exercisable or exchangeable for, or otherwise entitles the holder thereof to receive, Common Shares.

“**Effective Date**” means the effective date of the Registration Statement.

“**Exchange Act**” means the Securities Exchange Act of 1934, as amended, and the rules and regulations promulgated thereunder.

“**Person**” means an individual or corporation, partnership, trust, incorporated or unincorporated association, joint venture, limited liability company, joint stock company, government (or an agency or subdivision thereof) or other entity of any kind.

“**Registration Statement**” means the Company’s registration statement on Form S-1, as amended and supplemented (File No. 333-275870).

“**Rule 144**” means Rule 144 promulgated by the Commission pursuant to the Securities Act, as such Rule may be amended or interpreted from time to time, or any similar rule or regulation hereafter adopted by the Commission having substantially the same purpose and effect as such Rule.

“**Securities Act**” means the Securities Act of 1933, as amended, and the rules and regulations promulgated thereunder.

“**Trading Day**” means a day on which the Common Shares are traded on a Trading Market.

“**Trading Market**” means any of the following markets or exchanges on which the Common Shares are listed or quoted for trading on the date in question: the NYSE American, the Nasdaq Capital Market, the Nasdaq Global Market, the Nasdaq Global Select Market, the New York Stock Exchange, OTCQB or OTCQX (or any successors to any of the foregoing).

“**Transfer Agent**” means Computershare Investor Service, the current transfer agent of the Company, and any successor transfer agent of the Company.

“**Underwriting Agreement**” means the underwriting agreement, dated as of [], 2024 between the Company and Newbridge Securities Corporation, as amended, modified or supplemented from time to time in accordance with its terms.

“**VWAP**” means, for any date, the price determined by the first of the following clauses that applies: (a) if the Common Shares are then listed or quoted on a Trading Market, the daily volume weighted average price per Common Share for such date (or the nearest preceding date) on the Trading Market on which the Common Shares are then listed or quoted as reported by Bloomberg L.P. (based on a Trading Day from 9:30 a.m. (New York City time) to 4:02 p.m. (New York City time)), (b) if OTCQB or OTCQX is not a Trading Market, the volume weighted average price per share of the Common Shares for such date (or the nearest preceding date) on OTCQB or OTCQX as applicable, (c) if the Common Shares are not then listed or quoted for trading on OTCQB or OTCQX and if prices for the Common Shares are then reported on the Pink Open Market (or a similar organization or agency succeeding to its functions of reporting prices), the most recent bid price per Common Share so reported, or (d) in all other cases, the fair market value of a Common Share as determined by an independent appraiser selected in good faith by the holders of a majority in interest of the Warrants then outstanding and reasonably acceptable to the Company, the fees and expenses of which shall be paid by the Company.

“**Warrants**” means this Warrant and other Common Share purchase warrants issued by the Company as underwriting compensation pursuant to the Underwriting Agreement.

Section 2. Exercise.

a) Exercise of Warrant. Subject to the provisions of Section 2(e) herein, exercise of the purchase rights represented by this Warrant may be made, in whole or in part, at any time or times on or after the Initial Exercise Date and on or before the Termination Date by delivery to the Company (or such other office or agency of the Company as it may designate by notice in writing to the registered Holder at the address of the Holder appearing on the books of the Company) of a duly executed facsimile copy or PDF copy submitted by e-mail (or e-mail attachment) of the Notice of Exercise in the form annexed hereto (the “**Notice of Exercise**”), and, unless the cashless exercise procedure specified in Section 2(c) below is specified in the applicable Notice of Exercise, delivery of the aggregate Exercise Price of the Warrant Shares specified in the applicable Notice of Exercise as specified in this Section 2(a). Within the earlier of (i) two (2) Trading Days and (ii) the number of Trading Days comprising the Standard Settlement Period (as defined in Section 2(d)(i) herein) following the date of exercise as aforesaid, the Holder shall deliver the aggregate Exercise Price for the Warrant Shares specified in the applicable Notice of Exercise by wire transfer of immediately available funds or cashier’s check drawn on a United States bank unless the cashless exercise procedure specified in Section 2(c) below is specified in the applicable Notice of Exercise. No ink-

original Notice of Exercise shall be required, nor shall any medallion guarantee (or other type of guarantee or notarization) of any Notice of Exercise be required. Notwithstanding anything herein to the contrary, the Holder shall not be required to physically surrender this Warrant to the Company until the Holder has purchased all of the Warrant Shares available hereunder and the Warrant has been exercised in full, in which case, the Holder shall surrender this Warrant to the Company for cancellation within three (3) Trading Days of the date on which the final Notice of Exercise is delivered to the Company. Partial exercises of this Warrant resulting in purchases of a portion of the total number of Warrant Shares available hereunder shall have the effect of lowering the outstanding number of Warrant Shares purchasable hereunder in an amount equal to the applicable number of Warrant Shares purchased. The Company shall maintain records showing the number of Warrant Shares purchased and the date of such purchases. The Company shall deliver any objection to any Notice of Exercise within one (1) Business Day of receipt of such notice. **The Holder and any assignee, by acceptance of this Warrant, acknowledge and agree that, by reason of the provisions of this paragraph, following the purchase of a portion of the Warrant Shares hereunder, the number of Warrant Shares available for purchase hereunder at any given time may be less than the amount stated on the face hereof.**

b) Exercise Price. The exercise price per Common Share under this Warrant shall be \$[•]⁴, subject to adjustment hereunder (the “**Exercise Price**”).

c) Cashless Exercise. The Company shall use commercially reasonable efforts to cause the Registration Statement to remain effective with a current prospectus and to maintain the registration of the Common Shares under the Exchange Act for as long as this Warrant remains outstanding, provided for avoidance of doubt the foregoing covenant shall not require the Company to maintain registration following the completion of a Fundamental Transaction (as defined below) as a result of which this Warrant becomes exercisable for Alternate Consideration (as defined below). If at the time of exercise hereof there is no effective registration statement registering, or the prospectus contained therein is not available for the issuance of the Warrant Shares to the Holder, then this Warrant may only be exercised, in whole or in part, at such time by means of a “cashless exercise” in which the Holder shall be entitled to receive a number of Warrant Shares equal to the quotient obtained by dividing ((A-B)(X)) by (A), where:

(A) = as applicable: (i) the VWAP on the Trading Day immediately preceding the date of the applicable Notice of Exercise if such Notice of Exercise is (1) both executed and delivered pursuant to Section 2(a) hereof on a day that is not a Trading Day or (2) both executed and delivered pursuant to Section 2(a) hereof on a Trading Day prior to the opening of “regular trading hours” (as defined in Rule 600(b)(68) of Regulation NMS promulgated under the federal securities laws) on such Trading Day, (ii) at the option of the Holder, either (y) the VWAP on the Trading Day immediately preceding the date of the applicable Notice of Exercise or (z) the Bid Price of the Common Shares on the principal Trading Market as reported by Bloomberg L.P. as of the time of the Holder’s execution of the applicable Notice of Exercise if such Notice of Exercise is executed during “regular trading hours” on a Trading Day and is delivered within two (2) hours thereafter (including until two (2) hours after the close of “regular trading hours” on a Trading Day) pursuant to Section 2(a) hereof or (iii) the VWAP on the date of the applicable Notice of Exercise if the date of such Notice of Exercise is a Trading Day and such Notice of Exercise is both executed and delivered pursuant to Section 2(a) hereof after the close of “regular trading hours” on such Trading Day;

⁴ To be 125% of the effective per-share offering price.

(B) = the Exercise Price of this Warrant, as adjusted hereunder; and

(X) = the number of Warrant Shares that would be issuable upon exercise of this Warrant in accordance with the terms of this Warrant if such exercise were by means of a cash exercise rather than a cashless exercise.

If Warrant Shares are issued in such a cashless exercise, the parties acknowledge and agree that in accordance with Section 3(a)(9) of the Securities Act, the Warrant Shares shall take on the registered characteristics of the Warrants being exercised. The Company agrees not to take any position contrary to this Section 2(c).

Notwithstanding anything herein to the contrary, on the Termination Date, this Warrant shall be automatically exercised via cashless exercise pursuant to this Section 2(c).

d) Mechanics of Exercise.

i. Delivery of Warrant Shares Upon Exercise. The Company shall cause the Warrant Shares purchased hereunder to be transmitted by the Transfer Agent to the Holder by crediting the account of the Holder's or its designee's balance account with The Depository Trust Company through its Deposit or Withdrawal at Custodian system ("**DWAC**") if the Company is then a participant in such system and either (A) there is an effective registration statement permitting the issuance of the Warrant Shares to or resale of the Warrant Shares by Holder, or (B) the Warrant Shares are eligible for resale by the Holder without volume or manner-of-sale limitations pursuant to Rule 144, and otherwise by physical delivery of a certificate or other evidence of ownership of securities, registered in the Company's share register in the name of the Holder or its designee, for the number of Warrant Shares to which the Holder is entitled pursuant to such exercise to the address specified by the Holder in the Notice of Exercise by the date that is the earliest of (i) two (2) Trading Days after the delivery to the Company of the Notice of Exercise and (ii) the number of Trading Days comprising the Standard Settlement Period after the delivery to the Company of the Notice of Exercise (such date, the "**Warrant Share Delivery Date**"). Upon delivery of the Notice of Exercise, the Holder shall be deemed for all corporate purposes to have become the holder of record of the Warrant Shares with respect to which this Warrant has been exercised, irrespective of the date of delivery of the Warrant Shares, provided that payment of the aggregate Exercise Price (other than in the case of a cashless exercise) is received within the earlier of (i) two (2) Trading Days and (ii) the number of Trading Days comprising the Standard Settlement Period following delivery of the Notice of Exercise. If the Company fails for any reason to deliver to the Holder the Warrant Shares subject to a Notice of Exercise by the Warrant Share Delivery Date, then the Company shall pay to the Holder, in cash, as liquidated damages and not as a penalty, for each \$1,000 of Warrant Shares subject to such exercise (based on the VWAP of the Common Shares on the date of the applicable Notice of Exercise), \$10 per Trading Day (increasing to \$20 per Trading Day on the fifth Trading Day after the Warrant Share Delivery Date) for each Trading Day after such Warrant Share Delivery Date until such Warrant Shares are delivered or Holder rescinds such exercise. The Company agrees to maintain a transfer agent that is a participant in the FAST program so long as this Warrant remains outstanding and exercisable. As used herein, "**Standard Settlement Period**" means the standard settlement period, expressed in a number of Trading Days, on the Company's primary Trading Market with respect to the Common Shares as in effect on the date of delivery of the Notice of Exercise.

ii. Delivery of New Warrants Upon Exercise. If this Warrant shall have been exercised in part, the Company shall, at the request of a Holder and upon surrender of this Warrant certificate, at the time of delivery of the Warrant Shares, deliver to the Holder a new Warrant evidencing the rights of the Holder to purchase the unpurchased Warrant Shares called for by this Warrant, which new Warrant shall in all other respects be identical with this Warrant.

iii. Rescission Rights. If the Company fails to cause the Transfer Agent to transmit to the Holder the Warrant Shares pursuant to Section 2(d)(i) by the Warrant Share Delivery Date, then the Holder will have the right to rescind such exercise.

iv. Compensation for Buy-In on Failure to Timely Deliver Warrant Shares Upon Exercise. In addition to any other rights available to the Holder, if the Company fails to cause the Transfer Agent to transmit to the Holder the Warrant Shares in accordance with the provisions of Section 2(d)(i) above pursuant to an exercise on or before the Warrant Share Delivery Date, and if after such date the Holder is required by its broker to purchase (in an open market transaction or otherwise) or the Holder's brokerage firm otherwise purchases, Common Shares to deliver in satisfaction of a sale by the Holder of the Warrant Shares which the Holder anticipated receiving upon such exercise (a "Buy-In"), then the Company shall (A) pay in cash to the Holder the amount, if any, by which (x) the Holder's total purchase price (including brokerage commissions, if any) for the Common Shares so purchased exceeds (y) the amount obtained by multiplying (1) the number of Warrant Shares that the Company was required to deliver to the Holder in connection with the exercise at issue times (2) the price at which the sell order giving rise to such purchase obligation was executed, and (B) at the option of the Holder, either reinstate the portion of the Warrant and equivalent number of Warrant Shares for which such exercise was not honored (in which case such exercise shall be deemed rescinded) or deliver to the Holder the number of Common Shares that would have been issued had the Company timely complied with its exercise and delivery obligations hereunder. For example, if the Holder purchases Common Shares having a total purchase price of \$11,000 to cover a Buy-In with respect to an attempted exercise of Common Shares with an aggregate sale price giving rise to such purchase obligation of \$10,000, under clause (A) of the immediately preceding sentence the Company shall be required to pay the Holder \$1,000. The Holder shall provide the Company written notice indicating the amounts payable to the Holder in respect of the Buy-In and, upon request of the Company, evidence of the amount of such loss. Nothing herein shall limit a Holder's right to pursue any other remedies available to it hereunder, at law or in equity including, without limitation, a decree of specific performance and/or injunctive relief with respect to the Company's failure to timely deliver Common Shares upon exercise of the Warrant as required pursuant to the terms hereof.

v. No Fractional Shares or Scrip. No fractional shares or scrip representing fractional shares shall be issued upon the exercise of this Warrant. As to any fraction of a share which the Holder would otherwise be entitled to purchase upon such exercise, the Company shall, at its election, either pay a cash adjustment in respect of such final fraction in an amount equal to such fraction multiplied by the Exercise Price or round up to the next whole share.

vi. Charges, Taxes and Expenses. Issuance of Warrant Shares shall be made without charge to the Holder for any issue or transfer tax or other incidental expense in respect of the issuance of such Warrant Shares, all of which taxes and expenses shall be paid by the Company, and such Warrant Shares shall be issued in the name of the Holder or in such name or names as may be directed by the Holder; *provided, however*, that in the event that Warrant Shares are to be issued in a name other than the name of the Holder, this Warrant when surrendered for exercise shall be accompanied by the Assignment Form attached hereto duly executed by the Holder and the Company may require, as a condition thereto, the payment of a sum sufficient to reimburse it for any transfer tax incidental thereto. The Company shall pay all Transfer Agent fees required for same-day processing of any Notice of Exercise and all fees to the Depository Trust Company (or another established clearing corporation performing similar functions) required for same-day electronic delivery of the Warrant Shares.

vii. Closing of Books. The Company will not close its stockholder books or records in any manner which prevents the timely exercise of this Warrant, pursuant to the terms hereof.

viii. Signature. This Section 2 and the exercise form attached hereto set forth the totality of the procedures required of the Holder in order to exercise this Warrant. Without limiting the preceding sentences, no ink-original exercise form shall be required, nor shall any medallion guarantee (or other type of guarantee or notarization) of any exercise form be required in order to exercise this Warrant. No additional legal opinion, other information or instructions shall be required of the Holder to exercise this Warrant. The Company shall honor exercises of this Warrant and shall deliver Shares underlying this Warrant in accordance with the terms, conditions and time periods set forth herein.

e) Holder's Exercise Limitations. The Company shall not effect any exercise of this Warrant, and a Holder shall not have the right to exercise any portion of this Warrant, pursuant to Section 2 or otherwise, to the extent that after giving effect to such issuance after exercise as set forth on the applicable Notice of Exercise, the Holder (together with the Holder's Affiliates, and any other Persons acting as a group together with the Holder or any of the Holder's Affiliates (such Persons, "Attribution Parties")), would beneficially own in excess of the Beneficial Ownership Limitation (as defined below). For purposes of the foregoing sentence, the number of Common Shares beneficially owned by the Holder and its Affiliates and Attribution Parties shall include the number of Common Shares issuable upon exercise of this Warrant with respect to which such determination is being made, but shall exclude the number of Common Shares which would be issuable upon (i) exercise of the remaining, nonexercised portion of this Warrant beneficially owned by the Holder or any of its Affiliates or Attribution Parties and (ii) exercise or conversion of the unexercised or nonconverted portion of any other securities of the Company (including, without limitation, any other Common Share Equivalents) subject to a limitation on conversion or exercise analogous to the limitation contained herein beneficially owned by the Holder or any of its Affiliates or Attribution Parties to the extent such issuance would exceed such limitation. Except as set forth in the preceding sentence, for purposes of this Section 2(e), beneficial ownership shall be calculated in accordance with Section 13(d) of the Exchange Act and the rules and regulations promulgated thereunder, it being acknowledged by the Holder that the Company is not representing to the Holder that such calculation is in compliance with Section 13(d) of the Exchange Act and the Holder is solely

responsible for any schedules required to be filed in accordance therewith. To the extent that the limitation contained in this Section 2(e) applies, the determination of whether this Warrant is exercisable (in relation to other securities owned by the Holder together with any Affiliates and Attribution Parties) and of which portion of this Warrant is exercisable shall be in the sole discretion of the Holder, and the submission of a Notice of Exercise shall be deemed to be the Holder's determination of whether this Warrant is exercisable (in relation to other securities owned by the Holder together with any Affiliates and Attribution Parties) and of which portion of this Warrant is exercisable, in each case subject to the Beneficial Ownership Limitation, and the Company shall not have any obligation to verify or confirm the accuracy of such determination and neither of them shall have any liability for any error made by the Holder or any other Person. In addition, a determination as to any group status as contemplated above shall be determined in accordance with Section 13(d) of the Exchange Act and the rules and regulations promulgated thereunder. For purposes of this Section 2(e), in determining the number of outstanding Common Shares, a Holder may rely on the number of outstanding Common Shares as reflected in (A) the Company's most recent periodic or annual report filed with the Commission, as the case may be, (B) a more recent public announcement by the Company or (C) a more recent written notice by the Company or the Transfer Agent setting forth the number of Common Shares outstanding. Upon the written or oral request of a Holder, the Company shall within one Trading Day confirm orally and in writing to the Holder the number of Common Shares then outstanding. In any case, the number of outstanding Common Shares shall be determined after giving effect to the conversion or exercise of securities of the Company, including this Warrant, by the Holder or its Affiliates or Attribution Parties since the date as of which such number of outstanding Common Shares was reported. The "Beneficial Ownership Limitation" shall be 4.99% (or, upon election by a Holder prior to the issuance of any Warrants, 9.99%) of the number of Common Shares outstanding immediately after giving effect to the issuance of Common Shares issuable upon exercise of this Warrant. The Holder, upon notice to the Company, may increase or decrease the Beneficial Ownership Limitation provisions of this Section 2(e), provided that the Beneficial Ownership Limitation in no event exceeds 9.99% of the number of Common Shares outstanding immediately after giving effect to the issuance of Common Shares upon exercise of this Warrant held by the Holder and the provisions of this Section 2(e) shall continue to apply. Any increase in the Beneficial Ownership Limitation will not be effective until the 61st day after such notice is delivered to the Company. The provisions of this paragraph shall be construed and implemented in a manner otherwise than in strict conformity with the terms of this Section 2(e) to correct this paragraph (or any portion hereof) which may be defective or inconsistent with the intended Beneficial Ownership Limitation herein contained or to make changes or supplements necessary or desirable to properly give effect to such limitation. The limitations contained in this paragraph shall apply to a successor holder of this Warrant.

Section 3. Certain Adjustments.

a) Stock Dividends and Splits. If the Company, at any time while this Warrant is outstanding: (i) pays a stock dividend or otherwise makes a distribution or distributions on Common Shares or any other equity or equity equivalent securities payable in Common Shares (which, for avoidance of doubt, shall not include any Common Shares issued by the Company upon exercise of this Warrant), (ii) subdivides outstanding Common Shares into a larger number of shares, (iii) combines (including by way of reverse stock split) outstanding Common Shares into a smaller number of shares, or (iv) issues by reclassification of Common Shares any shares of capital stock of the Company, then in each case the Exercise Price shall be multiplied by a fraction of which the numerator shall be the number of Common Shares (excluding treasury shares, if any) outstanding immediately before such event and of which the denominator shall be the number of Common Shares outstanding immediately after such event, and the number of shares issuable upon exercise of this Warrant shall be proportionately adjusted such that the aggregate Exercise Price of this Warrant shall remain unchanged. Any adjustment made pursuant to this Section 3(a) shall become effective immediately after the record date for the determination of stockholders entitled to receive such dividend or distribution and shall become effective immediately after the effective date in the case of a subdivision, combination or re-classification.

b) Subsequent Rights Offerings. In addition to any adjustments pursuant to Section 3(a) above, if at any time the Company grants, issues or sells any Common Share Equivalents or rights to purchase stock, warrants, securities or other property pro rata to the record holders of any class of Common Shares (the “**Purchase Rights**”), then the Holder will be entitled to acquire, upon the terms applicable to such Purchase Rights, the aggregate Purchase Rights which the Holder could have acquired if the Holder had held the number of Common Shares acquirable upon complete exercise of this Warrant (without regard to any limitations on exercise hereof, including without limitation, the Beneficial Ownership Limitation) immediately before the date on which a record is taken for the grant, issuance or sale of such Purchase Rights, or, if no such record is taken, the date as of which the record holders of Common Shares are to be determined for the grant, issue or sale of such Purchase Rights; *provided, however*, to the extent that the Holder’s right to participate in any such Purchase Right would result in the Holder exceeding the Beneficial Ownership Limitation, then the Holder shall not be entitled to participate in such Purchase Right to such extent (or beneficial ownership of such Common Shares as a result of such Purchase Right to such extent) and such Purchase Right to such extent shall be held in abeyance for the Holder until such time, if ever, as its right thereto would not result in the Holder exceeding the Beneficial Ownership Limitation.

c) Pro Rata Distributions. During such time as this Warrant is outstanding, if the Company shall declare or make any dividend (other than cash dividends) or other distribution of its assets (or rights to acquire its assets) to holders of Common Shares, by way of return of capital or otherwise (including, without limitation, any distribution of stock or other securities, property or options by way of a dividend, spin off, reclassification, corporate rearrangement, scheme of arrangement or other similar transaction) (a “**Distribution**”), at any time after the issuance of this Warrant, then, in each such case, the Holder shall be entitled to participate in such Distribution to the same extent that the Holder would have participated therein if the Holder had held the number of Common Shares acquirable upon complete exercise of this Warrant (without regard to any limitations on exercise hereof, including without limitation, the Beneficial Ownership Limitation) immediately before the date of which a record is taken for such Distribution, or, if no such record is taken, the date as of which the record holders of Common Shares are to be determined for the participation in such Distribution (*provided, however*, to the extent that the Holder’s right to participate in any such Distribution would result in the Holder exceeding the Beneficial Ownership Limitation, then the Holder shall not be entitled to participate in such Distribution to such extent (or in the beneficial ownership of any Common Shares as a result of such Distribution to such extent) and the portion of such Distribution shall be held in abeyance for the benefit of the Holder until such time, if ever, as its right thereto would not result in the Holder exceeding the Beneficial Ownership Limitation). To the extent this Warrant has not been partially or completely exercised at the time of such Distribution, such portion of the Distribution shall be held in abeyance for the benefit of the Holder until the Holder has exercised this Warrant.

d) Fundamental Transaction. If, at any time while this Warrant is outstanding, (i) the Company, directly or indirectly, in one or more related transactions effects any merger or consolidation of the Company with or into another Person, (ii) the Company, directly or indirectly, effects any sale, lease, license, assignment, transfer, conveyance or other disposition of all or substantially all of its assets in one or a series of related transactions, (iii) any, direct or indirect, purchase offer, tender offer or exchange offer (whether by the Company or another Person) is completed pursuant to which holders of Common Shares are permitted to sell, tender or exchange their shares for other securities, cash or property and has been accepted by the holders of 50% or more of the outstanding Common Shares or 50% or more of the voting power of the then outstanding common equity of the Company, (iv) the Company, directly or indirectly, in one or more related transactions effects any reclassification, reorganization or recapitalization of the Common Shares or any compulsory share exchange pursuant to which the Common Shares are effectively

converted into or exchanged for other securities, cash or property, or (v) the Company, directly or indirectly, in one or more related transactions consummates a stock or share purchase agreement or other business combination (including, without limitation, a reorganization, recapitalization, spin-off, merger or scheme of arrangement) with another Person or group of Persons whereby such other Person or group acquires more than 50% of the outstanding Common Shares or 50% or more of the voting power of the then outstanding common equity of the Company (not including any Common Shares held by the other Person or other Persons making or party to, or associated or affiliated with the other Persons making or party to, such stock or share purchase agreement or other business combination) (each a “Fundamental Transaction”), then, upon any subsequent exercise of this Warrant, the Holder shall have the right to receive, for each Warrant Share that would have been issuable upon such exercise immediately prior to the occurrence of such Fundamental Transaction (without regard to any limitation in Section 2(e) on the exercise of this Warrant), the number of Common Shares of the successor or acquiring corporation or of the Company, if it is the surviving corporation, and any additional consideration (together, the “Alternate Consideration”) receivable as a result of such Fundamental Transaction by a holder of the number of Common Shares for which this Warrant is exercisable immediately prior to such Fundamental Transaction (without regard to any limitation in Section 2(e) on the exercise of this Warrant). For purposes of any such exercise, the determination of the Exercise Price shall be appropriately adjusted to apply to such Alternate Consideration based on the amount of Alternate Consideration issuable in respect of one Common Share in such Fundamental Transaction, and the Company shall apportion the Exercise Price among the Alternate Consideration in a reasonable manner reflecting the relative value of any different components of the Alternate Consideration. If holders of Common Shares are given any choice as to the securities, cash or property to be received in a Fundamental Transaction, then the Holder shall be given the same choice as to the Alternate Consideration it receives upon any exercise of this Warrant following such Fundamental Transaction. The Company shall cause any successor entity in a Fundamental Transaction in which the Company is not the survivor (the “Successor Entity”) to assume in writing all of the obligations of the Company under this Warrant in accordance with the provisions of this Section 3(d) pursuant to written agreements in form and substance reasonably satisfactory to the Company and the holders of Warrants representing at least a majority of the Common Shares underlying the Warrants then outstanding (the “**Required Holders**”) and approved by the Required Holders (without unreasonable delay) prior to such Fundamental Transaction and shall deliver to the Holder in exchange for this Warrant a security of the Successor Entity evidenced by a written instrument substantially similar in form and substance to this Warrant which is exercisable for a corresponding number of shares of capital stock of such Successor Entity (or its parent entity) equivalent to the Common Shares acquirable and receivable upon exercise of this Warrant (without regard to any limitations on the exercise of this Warrant) prior to such Fundamental Transaction, and with an exercise price which applies the exercise price hereunder to such shares of capital stock (but taking into account the relative value of the Common Shares pursuant to such Fundamental Transaction and the value of such shares of capital stock, such number of shares of capital stock and such exercise price being for the purpose of protecting the economic value of this Warrant immediately prior to the consummation of such Fundamental Transaction), and which is reasonably satisfactory in form and substance to the Holder. Upon the occurrence of any such Fundamental Transaction, the Successor Entity shall succeed to, and be substituted for (so that from and after the date of such Fundamental Transaction, the provisions of this Warrant referring to the “Company” shall refer instead to the Successor Entity), and may exercise every right and power of the Company and shall assume all of the obligations of the Company under this Warrant with the same effect as if such Successor Entity had been named as the Company herein.

e) Calculations. All calculations under this Section 3 shall be made by the Company to the nearest cent or the nearest 1/100th of a share, as the case may be. For purposes of this Section 3, the number of Common Shares deemed to be issued and outstanding as of a given date shall be the sum of the number of Common Shares (excluding treasury shares, if any) issued and outstanding.

f) Notice to Holder.

i. Adjustment to Exercise Price. Whenever the Exercise Price is adjusted pursuant to any provision of this Section 3, the Company shall promptly deliver to the Holder by facsimile or email a notice setting forth the Exercise Price after such adjustment and any resulting adjustment to the number of Warrant Shares and setting forth a brief statement of the facts requiring such adjustment.

ii. Notice to Allow Exercise by Holder. If (A) the Company shall declare a dividend (or any other distribution in whatever form) on the Common Shares, (B) the Company shall declare a special nonrecurring cash dividend on or a redemption of the Common Shares, (C) the Company shall authorize the granting to all holders of the Common Shares rights or warrants to subscribe for or purchase any shares of capital stock of any class or of any rights, (D) the approval of any stockholders of the Company shall be required in connection with any reclassification of the Common Shares, any consolidation or merger to which the Company is a party, any sale or transfer of all or substantially all of the assets of the Company, or any compulsory share exchange whereby Common Shares are converted into other securities, cash or property, or (E) the Company shall authorize the voluntary or involuntary dissolution, liquidation or winding up of the affairs of the Company, then, in each case, the Company shall cause to be delivered by facsimile or email to the Holder at its last facsimile number or email address as it shall appear upon the Warrant Register of the Company, at least 20 calendar days prior to the applicable record or effective date hereinafter specified, a notice stating (x) the date on which a record is to be taken for the purpose of such dividend, distribution, redemption, rights or warrants, or if a record is not to be taken, the date as of which the holders of the Common Shares of record to be entitled to such dividend, distributions, redemption, rights or warrants are to be determined or (y) the date on which such reclassification, consolidation, merger, sale, transfer or share exchange is expected to become effective or close, and the date as of which it is expected that holders of the Common Shares of record shall be entitled to exchange their Common Shares for securities, cash or other property deliverable upon such reclassification, consolidation, merger, sale, transfer or share exchange; provided that the failure to deliver such notice or any defect therein or in the delivery thereof shall not affect the validity of the corporate action required to be specified in such notice. To the extent that any notice provided in this Warrant constitutes, or contains, material, non-public information regarding the Company or any of the Subsidiaries, the Company shall simultaneously file such notice with the Commission pursuant to a Current Report on Form 8-K. The Holder shall remain entitled to exercise this Warrant during the period commencing on the date of such notice to the effective date of the event triggering such notice except as may otherwise be expressly set forth herein.

Section 4. Transfer of Warrant.

a) Transferability. Pursuant to FINRA Rule 5110(g)(1), neither this Warrant nor any Warrant Shares issued upon exercise of this Warrant shall be sold, transferred, assigned, pledged, or hypothecated, or be the subject of any hedging, short sale, derivative, put, or call transaction that would result in the effective economic disposition of the securities by any person for a period of 180 days immediately following the Effective Date or commencement of sales of the offering pursuant to which this Warrant is being issued, except the transfer of any security:

i. by operation of law or by reason of reorganization of the Company;

- ii. to any FINRA member firm participating in the offering and the officers or partners thereof, if all securities so transferred remain subject to the lock-up restriction in this Section 4(a) for the remainder of the time period;
- iii. if the aggregate amount of securities of the Company held by the Holder or related person do not exceed 1% of the securities being offered;
- iv. that is beneficially owned on a pro-rata basis by all equity owners of an investment fund, provided that no participating member manages or otherwise directs investments by the fund, and participating members in the aggregate do not own more than 10% of the equity in the fund; or
- v. the exercise or conversion of any security, if all securities received remain subject to the lock-up restriction in this Section 4(a) for the remainder of the time period.

Subject to the foregoing restriction, the Securities Act and any other applicable securities laws, and the conditions set forth in Section 4(d), this Warrant and all rights hereunder are transferable, in whole or in part, upon surrender of this Warrant at the principal office of the Company or its designated agent, together with a written assignment of this Warrant substantially in the form attached hereto duly executed by the Holder or its agent or attorney and funds sufficient to pay any transfer taxes payable upon the making of such transfer. Upon such surrender and, if required, such payment, the Company shall execute and deliver a new Warrant or Warrants in the name of the assignee or assignees, as applicable, and in the denomination or denominations specified in such instrument of assignment, and shall issue to the assignor a new Warrant evidencing the portion of this Warrant not so assigned, and this Warrant shall promptly be cancelled. Notwithstanding anything herein to the contrary, the Holder shall not be required to physically surrender this Warrant to the Company unless the Holder has assigned this Warrant in full, in which case, the Holder shall surrender this Warrant to the Company within three (3) Trading Days of the date on which the Holder delivers an assignment form to the Company assigning this Warrant in full. The Warrant, if properly assigned in accordance herewith, may be exercised by a new holder for the purchase of Warrant Shares without having a new Warrant issued.

b) New Warrants. This Warrant may be divided or combined with other Warrants upon presentation hereof at the aforesaid office of the Company, together with a written notice specifying the names and denominations in which new Warrants are to be issued, signed by the Holder or its agent or attorney. Subject to compliance with Section 4(a), as to any transfer which may be involved in such division or combination, the Company shall execute and deliver a new Warrant or Warrants in exchange for the Warrant or Warrants to be divided or combined in accordance with such notice. All Warrants issued on transfers or exchanges shall be dated the initial issuance date of this Warrant and shall be identical with this Warrant except as to the number of Warrant Shares issuable pursuant thereto.

c) Warrant Register. The Company shall register this Warrant, upon records to be maintained by the Company for that purpose (the "**Warrant Register**"), in the name of the record Holder hereof from time to time. The Company may deem and treat the registered Holder of this Warrant as the absolute owner hereof for the purpose of any exercise hereof or any distribution to the Holder, and for all other purposes, absent actual notice to the contrary.

d) Representation by the Holder. The Holder, by the acceptance hereof, represents and warrants that it is acquiring this Warrant and, upon any exercise hereof, will acquire the Warrant Shares issuable upon such exercise, for its own account and not with a view to or for distributing or reselling such Warrant Shares or any part thereof in violation of the Securities Act or any applicable state securities law, except pursuant to sales registered or exempted under the Securities Act.

Section 5. Miscellaneous.

a) No Rights as Stockholder Until Exercise; No Settlement in Cash. This Warrant does not entitle the Holder to any voting rights, dividends or other rights as a stockholder of the Company prior to the exercise hereof as set forth in Section 2(d)(i), except as expressly set forth in Section 3. Without limiting any rights of a Holder to receive Warrant Shares on a “cashless exercise” pursuant to Section 2(c) or to receive cash payments pursuant to Section 2(d)(i) and Section 2(d)(iv) herein, in no event shall the Company be required to net cash settle an exercise of this Warrant.

b) Loss, Theft, Destruction or Mutilation of Warrant. The Company covenants that upon receipt by the Company of evidence reasonably satisfactory to it of the loss, theft, destruction or mutilation of this Warrant or any stock certificate relating to the Warrant Shares, and in case of loss, theft or destruction, of indemnity or security reasonably satisfactory to it (which, in the case of the Warrant, shall not include the posting of any bond), and upon surrender and cancellation of such Warrant or stock certificate, if mutilated, the Company will make and deliver a new Warrant or stock certificate of like tenor and dated as of such cancellation, in lieu of such Warrant or stock certificate.

c) Saturdays, Sundays, Holidays, etc. If the last or appointed day for the taking of any action or the expiration of any right required or granted herein shall not be a Business Day, then, such action may be taken or such right may be exercised on the next succeeding Business Day.

d) Authorized Shares.

The Company covenants that, during the period the Warrant is outstanding, it will reserve from its authorized and unissued Common Shares a sufficient number of shares to provide for the issuance of the Warrant Shares upon the exercise of any purchase rights under this Warrant. The Company further covenants that its issuance of this Warrant shall constitute full authority to its officers who are charged with the duty of issuing the necessary Warrant Shares upon the exercise of the purchase rights under this Warrant. The Company will take all such reasonable action as may be necessary to assure that such Warrant Shares may be issued as provided herein without violation of any applicable law or regulation, or of any requirements of the Trading Market upon which the Common Shares may be listed. The Company covenants that all Warrant Shares which may be issued upon the exercise of the purchase rights represented by this Warrant will, upon exercise of the purchase rights represented by this Warrant and payment for such Warrant Shares in accordance herewith, be duly authorized, validly issued, fully paid and nonassessable and free from all taxes, liens and charges created by the Company in respect of the issue thereof (other than taxes in respect of any transfer occurring contemporaneously with such issue).

Except and to the extent as waived or consented to by the Holder, the Company shall not by any action, including, without limitation, amending its certificate of incorporation or through any reorganization, transfer of assets, consolidation, merger, dissolution, issue or sale of securities or any other voluntary action, avoid or seek to avoid the observance or performance of any of the terms of this Warrant, but will at all times in good faith assist in the carrying out of all such terms and in the taking of all such actions as may be necessary or appropriate to protect the rights of Holder as set forth in this Warrant against impairment. Without limiting the generality of the foregoing, the Company will (i) not increase the par value of any Warrant Shares above the amount payable therefor upon such exercise immediately prior to such increase in par value, (ii) take all such action as may be necessary or appropriate in order that the Company may validly and legally issue fully paid and nonassessable Warrant Shares upon the exercise of this Warrant and (iii) use commercially reasonable efforts to obtain all such authorizations, exemptions or consents from any public regulatory body having jurisdiction thereof, as may be, necessary to enable the Company to perform its obligations under this Warrant.

Before taking any action which would result in an adjustment in the number of Warrant Shares for which this Warrant is exercisable or in the Exercise Price, the Company shall obtain all such authorizations or exemptions thereof, or consents thereto, as may be necessary from any public regulatory body or bodies having jurisdiction thereof.

e) Jurisdiction. All questions concerning the construction, validity, enforcement and interpretation of this Warrant shall be determined in accordance with the provisions of the Underwriting Agreement.

f) Restrictions. The Holder acknowledges that the Warrant Shares acquired upon the exercise of this Warrant, if not registered, and the Holder does not utilize cashless exercise, will have restrictions upon resale imposed by state and federal securities laws.

g) Nonwaiver and Expenses. No course of dealing or any delay or failure to exercise any right hereunder on the part of Holder shall operate as a waiver of such right or otherwise prejudice the Holder's rights, powers or remedies. No provision of this Warrant shall be construed as a waiver by the Holder of any rights that the Holder may have under U.S. federal securities laws and the rules and regulation of the Commission thereunder. Without limiting any other provision of this Warrant or the Underwriting Agreement, if the Company willfully and knowingly fails to comply with any provision of this Warrant, which results in any material damages to the Holder, the Company shall pay to the Holder such amounts as shall be sufficient to cover any costs and expenses including, but not limited to, reasonable attorneys' fees, including those of appellate proceedings, incurred by the Holder in collecting any amounts due pursuant hereto or in otherwise enforcing any of its rights, powers or remedies hereunder.

h) Notices. Any notice, request or other document required or permitted to be given or delivered to the Holder by the Company shall be delivered in accordance with the notice provisions of the Underwriting Agreement.

i) Limitation of Liability. No provision hereof, in the absence of any affirmative action by the Holder to exercise this Warrant to purchase Warrant Shares, and no enumeration herein of the rights or privileges of the Holder, shall give rise to any liability of the Holder for the purchase price of any Common Share or as a stockholder of the Company, whether such liability is asserted by the Company or by creditors of the Company.

j) Remedies. The Holder, in addition to being entitled to exercise all rights granted by law, including recovery of damages, will be entitled to specific performance of its rights under this Warrant. The Company agrees that monetary damages would not be adequate compensation for any loss incurred by reason of a breach by it of the provisions of this Warrant and hereby agrees to waive and not to assert the defense in any action for specific performance that a remedy at law would be adequate.

k) Successors and Assigns. Subject to applicable securities laws, this Warrant and the rights and obligations evidenced hereby shall inure to the benefit of and be binding upon the successors and permitted assigns of the Company and the successors and permitted assigns of Holder. The provisions of this Warrant are intended to be for the benefit of any Holder from time to time of this Warrant and shall be enforceable by the Holder or holder of Warrant Shares.

l) Amendment. This Warrant may be modified or amended or the provisions hereof waived with the written consent of the Company and the Required Holders.

m) Severability. Wherever possible, each provision of this Warrant shall be interpreted in such manner as to be effective and valid under applicable law, but if any provision of this Warrant shall be prohibited by or invalid under applicable law, such provision shall be ineffective to the extent of such prohibition or invalidity, without invalidating the remainder of such provisions or the remaining provisions of this Warrant.

n) Headings. The headings used in this Warrant are for the convenience of reference only and shall not, for any purpose, be deemed a part of this Warrant.

(Signature Page Follows)

IN WITNESS WHEREOF, the Company has caused this Warrant to be executed by its officer thereunto duly authorized as of the date first above indicated.

APTOSE BIOSCIENCES INC.

By: _____
Name:
Title:

[SIGNATURE PAGE]
APTOSE BIOSCIENCES INC. – UNDERWRITER’S WARRANT

NOTICE OF EXERCISE

TO: APTOSE BIOSCIENCES INC.

(1) The undersigned hereby elects to purchase _____ Warrant Shares of the Company pursuant to the terms of the attached Warrant (only if exercised in full), and tenders herewith payment of the exercise price in full, together with all applicable transfer taxes, if any.

(2) Payment shall take the form of (check applicable box):

- in lawful money of the United States; or
- if permitted the cancellation of such number of Warrant Shares as is necessary, in accordance with the formula set forth in subsection 2(c), to exercise this Warrant with respect to the maximum number of Warrant Shares purchasable pursuant to the cashless exercise procedure set forth in subsection 2(c).

(3) Please issue said Warrant Shares in the name of the undersigned or in such other name as is specified below:

The Warrant Shares shall be delivered to the following DWAC Account Number or by physical delivery of a certificate to:

(4) Accredited Investor. If the Warrant is being exercised via cash exercise and the registration statement registering the issue of the shares under the Warrant is no longer effective, the undersigned is an "accredited investor" as defined in Regulation D promulgated under the Securities Act of 1933, as amended

[SIGNATURE OF HOLDER]

Name of Investing Entity: _____

Signature of Authorized Signatory of Investing Entity: _____

Name of Authorized Signatory: _____

Title of Authorized Signatory: _____

Date: _____

ASSIGNMENT FORM

(To assign the foregoing Warrant, execute this form and supply required information. Do not use this form to purchase shares.)

FOR VALUE RECEIVED, the foregoing Warrant and all rights evidenced thereby are hereby assigned to

Name: _____
(Please Print)

Address: _____
(Please Print)

Phone Number: _____

Email Address: _____

Dated: _____, _____

Holder's Signature: _____

Holder's Address: _____

December 29, 2023

Aptose Biosciences Inc.
251 Consumers Road, Suite 1105
Toronto, Ontario, M2J 4R3

Re: Registration Statement on Form S-1 (File No. 333-275870)

Ladies and Gentlemen:

We have acted as United States counsel to Aptose Biosciences Inc., a Canadian corporation (the "Corporation"), in connection with a Registration Statement on Form S-1 (as amended or supplemented, the "Registration Statement") filed by the Corporation with the Securities and Exchange Commission (the "Commission") under the Securities Act of 1933, as amended (the "Securities Act"), relating to the registration by the Corporation of securities consisting of (a) (i) up to 2,489,177 common shares, no par value ("Offered Shares") (includes the exercise of the over-allotment option), or (ii) in lieu thereof, up to 2,164,502 pre-funded warrants (the "Pre-Funded Warrants") to purchase up to 2,489,177 Offered Shares, (b) up to 2,489,177 warrants (the "Warrants") (includes the exercise of the over-allotment option) to purchase up to 2,489,177 common shares and (c) up to 174,242 warrants to purchase 174,242 Offered Shares, issued to the underwriter (the "Underwriter's Warrants") (includes the exercise of the over-allotment option).

We have examined such documents and have reviewed such questions of law as we have considered necessary or appropriate for the purposes of our opinions set forth below. In rendering our opinions set forth below, we have assumed the authenticity of all documents submitted to us as originals, the genuineness of all signatures and the conformity to authentic originals of all documents submitted to us as copies. We have also assumed the legal capacity for all purposes relevant hereto of all natural persons. As to questions of fact material to our opinions, we have relied upon certificates or comparable documents of officers and other representatives of the Corporation and of public officials.

Based on the foregoing, we are of the opinion that the Pre-Funded Warrants, Warrants and the Underwriter's Warrants, when duly executed by the Corporation and duly delivered to the purchasers thereof against payment therefor as described in the Registration Statement, will constitute valid and binding obligations of the Corporation, enforceable against the Corporation in accordance with their terms.

(a) Our opinions set forth above are subject to the effect of any applicable bankruptcy, insolvency, reorganization, moratorium or similar law relating to or affecting creditors' rights generally (including, without limitation, fraudulent conveyance laws).

(b) Our opinions set forth in paragraphs above are subject to the effect of general principles of equity, including, without limitation, concepts of materiality, reasonableness, good faith and fair dealing and the possible unavailability of specific performance or injunctive relief, regardless of whether considered in a proceeding in equity or at law.

(c) Our opinions set forth in paragraphs above are subject to limitations regarding the availability of indemnification and contribution where such indemnification or contribution may be limited by applicable law or the application of principles of public policy.

(d) We express no opinion as to the enforceability of (i) provisions that relate to choice of law, forum selection or submission to jurisdiction (including, without limitation, any express or implied waiver of any objection to venue in any court or of any objection that a court is an inconvenient forum) to the extent that the validity, binding effect or enforceability of any such provision is to be determined by any court other than a state court of the State of New York, (ii) waivers by the Corporation of any statutory or constitutional rights or remedies, (iii) terms which excuse any person or entity from liability for, or require the Corporation to indemnify such person or entity against, such person's or entity's negligence or willful misconduct or (iv) obligations to pay any prepayment premium, default interest rate, early termination fee or other form of liquidated damages, if the payment of such premium, interest rate, fee or damages may be construed as unreasonable in relation to actual damages or disproportionate to actual damages suffered as a result of such prepayment, default or termination.

(e) We draw your attention to the fact that, under certain circumstances, the enforceability of terms to the effect that provisions may not be waived or modified except in writing may be limited.

Our opinions expressed above are limited to the laws of the State of New York.

We hereby consent to the filing of this opinion as an exhibit to the Registration Statement, and to the reference to our firm under the heading "Legal Matters" in the prospectus constituting part of the Registration Statement. In giving this consent, we do not admit that we are within the category of persons whose consent is required under Section 7 of the Securities Act or the rules and regulations of the Commission thereunder.

Very truly yours,
/s/ Dorsey & Whitney LLP

DMM/AWE



KPMG LLP
100 New Park Place, Suite 1400
Vaughan, ON L4K 0J3
Tel 905-265 5900
Fax 905-265 6390
www.kpmg.ca

Consent of Independent Registered Public Accounting Firm

The Board of Directors

Aptose Biosciences Inc.

We consent to the use of our report dated March 23, 2023, on the consolidated financial statements of Aptose Biosciences Inc., which comprise the consolidated statements of financial position as at December 31, 2022 and December 31, 2021, the related consolidated statements of loss and comprehensive loss, changes in shareholders' equity and cash flows for the years then ended, and the related notes, which is incorporated by reference, and to the reference to our firm under the heading "Experts", in the prospectus included in the Amendment No. 2 to the Registration Statement (No. 333-275870) dated December 29, 2023 on Form S-1 of Aptose Biosciences Inc.

/s/ KPMG LLP

Chartered Professional Accountants, Licensed Public Accountants

December 29, 2023

Vaughan, Canada

Calculation of Filing Fee Tables

Form S-1
(Form Type)

Aptose Biosciences Inc.

(Exact Name of Each Registrant as Specified in its Charter)

Table 1: Newly Registered and Carry Forward Securities

	Security Type	Security Class Title	Fee Calculation or Carry Forward Rule	Amount Registered	Proposed Maximum Offering Price Per Unit	Maximum Aggregate Offering Price(1)	Fee Rate	Amount of Registration Fee
Fees to Be Paid	Equity	Common Shares, no par value per share("Common Shares")(2)	457(o)			\$5,750,000(6)	0.00014760	\$848.70
	Other	Pre-funded Warrants to purchase Common Shares(3)	Other			—		(3)
	Equity	Common Shares underlying the Pre-Funded Warrant(3)	457(o)			—		(3)
	Other	Warrants to purchase Common Shares	Other			—		(4)
	Equity	Common Shares underlying the Warrants to purchase Common Shares	457(o)			\$5,750,000(6)	0.00014760	\$848.70
	Equity	Underwriter's Warrants to purchase Common Shares	Other					(5)
	Equity	Common Shares underlying Underwriter's Warrants	Other			\$503,124 (6)	0.00014760	\$74.26
		Total Offering Amounts				\$12,003,124	0.00014760	\$1540.58
		Total Fees Previously Paid						\$1,771.66
		Total Fee Offsets						—
		Net Fee Due						\$0

- (1) Estimated solely for the purpose of calculating the amount of the registration fee in pursuant to Rule 457(o) under the Securities Act of 1933, as amended (the "Securities Act")
- (2) Pursuant to Rule 416 under the Securities Act, this registration statement shall also cover any additional shares of the registrant's securities that become issuable by reason of any share splits, share dividends or similar transactions.
- (3) The proposed maximum aggregate offering price of the Common Shares will be reduced on a dollar-for-dollar basis based on the offering price of any pre-funded warrants issued in the offering, and the proposed maximum aggregate offering price of the pre-funded warrants to be issued in the offering will be reduced on a dollar-for-dollar basis based on the offering price of any Common Share issued in the offering. Accordingly, the proposed maximum aggregate offering price of the Common Shares and pre-funded warrants (including the Common Shares issuable upon exercise of the pre-funded warrants), if any, is \$5,000,000.
- (4) No separate registration fee is payable pursuant to Rule 457(g) under the Securities Act.
- (5) Estimated solely for the purpose of calculating the registration fee pursuant to Rule 457(g) under the Securities Act. The Underwriter's Warrants are exercisable at a per share exercise price equal to 125% of the public offering price. As estimated solely for the purpose of calculating the registration fee pursuant to Rule 457(g) under the Securities Act, the proposed maximum aggregate offering price of the underwriter's warrants is \$437,500, which is equal to 7% of the aggregate offering price.
- (6) Includes common shares issuable upon exercise of the underwriters' over-allotment option to purchase additional common shares and/or warrants in an amount representing 15% of the common shares and warrants in the offering