BANK OF NOVA SCOTIA
Form FWP
November 14, 2018

Subject to Completion
Preliminary Term Sheet dated November 14, 2018

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(To Prospectus dated February 1, 2017,
Prospectus Supplement dated February 13, 2017,
Prospectus Addendum dated January 9, 2018 and
Product Prospectus Supplement EQUITY INDICES LIRN-1 dated February 23, 2017)

Units
$10 principal amount per unit
CUSIP No.

| | |
|---|---|
| Pricing Date* | November , 2018 |
| Settlement Date* | December , 2018 |
| Maturity Date* | November , 2020 |

* Subject to change based on the actual date the notes are priced for initial sale to the public (the "pricing date")

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Capped Leveraged Index Return Notes® Linked to the S&P 500® Index

- § Maturity of approximately two years
- § 1.5-to-1 upside exposure to increases in the Index, subject to a capped return of [14.00% to 18.00%]
- § 1-to-1 downside exposure to decreases in the Index beyond a 10.00% decline, with up to 90.00% of your principal at risk
- § All payments occur at maturity and are subject to the credit risk of The Bank of Nova Scotia

- No periodic interest payments
- In addition to the underwriting discount set forth below, the notes include a hedging-related charge of $0.075 per unit. See "Structuring the Notes"
- Limited secondary market liquidity, with no exchange listing
- The notes are unsecured debt securities and are not savings accounts or insured deposits of a bank. The notes are not insured or guaranteed by the Canada Deposit Insurance Corporation (the "CDIC"), the U.S. Federal Deposit Insurance Corporation (the "FDIC"), or any other governmental agency of Canada, the United States or any other jurisdiction

The notes are being issued by The Bank of Nova Scotia ("BNS"). There are important differences between the notes and a conventional debt security, including different investment risks and certain additional costs. See "Risk Factors" beginning on page TS-6 of this term sheet and beginning on page PS-6 of product prospectus supplement EQUITY INDICES LIRN-1.

The initial estimated value of the notes as of the pricing date is expected to be between $9.34 and $9.64 per unit, which is less than the public offering price listed below. See "Summary" on the following page, "Risk Factors" beginning on page TS-6 of this term sheet and "Structuring the Notes" on page TS-14 of this term sheet for additional information. The actual value of your notes at any time will reflect many factors and cannot be predicted with accuracy.

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None of the U.S. Securities and Exchange Commission (the "SEC"), any state securities commission, or any other regulatory body has approved or disapproved of these securities or determined if this Note Prospectus (as defined

below) is truthful or complete. Any representation to the contrary is a criminal offense.

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| | Per Unit | Total |
|---|---|---|
| Public offering price[(1)] | $10.00 | $ |
| Underwriting discount[(1)] | $ 0.20 | $ |
| Proceeds, before expenses, to BNS | $ 9.80 | $ |

(1) For any purchase of 500,000 units or more in a single transaction by an individual investor or in combined transactions with the investor's household in this offering, the public offering price and the underwriting discount will be $9.95 per unit and $0.15 per unit, respectively. See "Supplement to the Plan of Distribution" below.

The notes:

| Are Not FDIC Insured | Are Not Bank Guaranteed | May Lose Value |
|---|---|---|

Merrill Lynch & Co.
November , 2018

Capped Leveraged Index Return Notes®
Linked to the S&P 500® Index due November , 2020

Summary

The Capped Leveraged Index Return Notes® Linked to the S&P 500® Index, due November , 2020 (the "notes") are our senior unsecured debt securities. The notes are not guaranteed or insured by the CDIC or the FDIC, and are not, either directly or indirectly, an obligation of any third party. The notes will rank equally with all of our other unsecured senior debt. Any payments due on the notes, including any repayment of principal, will be subject to the credit risk of BNS. The notes provide you a leveraged return, subject to a cap, if the Ending Value of the Market Measure, which is the S&P 500® Index (the "Index"), is greater than the Starting Value. If the Ending Value is equal to or less than the Starting Value but greater than or equal to the Threshold Value, you will receive the principal amount of your notes. If the Ending Value is less than the Threshold Value, you will lose a portion, which could be significant, of the principal amount of your notes. Any payments on the notes will be calculated based on the $10 principal amount per unit and will depend on the performance of the Index, subject to our credit risk. See "Terms of the Notes" below.

The economic terms of the notes (including the Capped Value) are based on our internal funding rate, which is the rate we would pay to borrow funds through the issuance of market-linked notes, and the economic terms of certain related hedging arrangements. Our internal funding rate is typically lower than the rate we would pay when we issue conventional fixed rate debt securities. This difference in funding rate, as well as the underwriting discount and the hedging related charge described below, will reduce the economic terms of the notes to you and the initial estimated value of the notes on the pricing date. Due to these factors, the public offering price you pay to purchase the notes will be greater than the initial estimated value of the notes.

On the cover page of this term sheet, we have provided the initial estimated value range for the notes. This range of estimated values was determined by reference to our internal pricing models, which take into consideration certain factors, such as our internal funding rate on the pricing date and our assumptions about market parameters. For more information about the initial estimated value and the structuring of the notes, see "Structuring the Notes" on page TS-14.

Terms of the Notes

| | |
|---|---|
| Issuer: | The Bank of Nova Scotia ("BNS") |
| Principal Amount: | $10.00 per unit |
| Term: | Approximately two years |
| Market Measure: | The S&P 500® Index (Bloomberg symbol: "SPX"), a price return index |
| Starting Value: | The closing level of the Market Measure on the pricing date |
| Ending Value: | The average of the closing levels of the Market Measure on each calculation day occurring during the Maturity Valuation Period. The scheduled calculation days are subject to postponement in the event of Market Disruption Events, as described beginning on page PS-18 of product prospectus supplement EQUITY INDICES LIRN-1. |
| Threshold Value: | 90.00% of the Starting Value, rounded to two decimal places. |
| Participation Rate: | 150% |
| Capped Value: | [$11.40 to $11.80] per unit, which represents a return of [14.00% to 18.00%] over the principal amount. The actual Capped Value will be determined on the pricing date. |
| Maturity Valuation Period: | Five scheduled calculation days shortly before the maturity date. |

Redemption Amount Determination

On the maturity date, you will receive a cash payment per unit determined as follows:

| | |
|---|---|
| Fees and Charges: | The underwriting discount of $0.20 per unit listed on the cover page and the hedging related charge of $0.075 per unit described in “Structuring the Notes” on page TS-14. |
| Calculation Agent: | Merrill Lynch, Pierce, Fenner & Smith Incorporated (“MLPF&S”). |

Capped Leveraged Index Return Notes®
Linked to the S&P 500® Index due November , 2020
The terms and risks of the notes are contained in this term sheet and in the following:

§ Product prospectus supplement EQUITY INDICES LIRN-1 dated February 23, 2017:
https://www.sec.gov/Archives/edgar/data/9631/000110465917011151/a17-4372_3424b5.htm

§ Prospectus addendum dated January 9, 2018:
https://www.sec.gov/Archives/edgar/data/9631/000091412118000045/bn20180108-424b3.htm

§ Prospectus supplement dated February 13, 2017:
https://www.sec.gov/Archives/edgar/data/9631/000110465917008642/a17-4372_1424b3.htm

§ Prospectus dated February 1, 2017:
https://www.sec.gov/Archives/edgar/data/9631/000119312517027656/d338678d424b3.htm

These documents (together, the "Note Prospectus") have been filed as part of a registration statement with the SEC, which may, without cost, be accessed on the SEC website as indicated above or obtained from MLPF&S by calling 1-800-294-1322. Before you invest, you should read the Note Prospectus, including this term sheet, for information about us and this offering. Any prior or contemporaneous oral statements and any other written materials you may have received are superseded by the Note Prospectus. Capitalized terms used but not defined in this term sheet have the meanings set forth in product prospectus supplement EQUITY INDICES LIRN-1. Unless otherwise indicated or unless the context requires otherwise, all references in this document to "we," "us," "our," or similar references are to BNS.

Investor Considerations

You may wish to consider an investment in the notes if:

§ You anticipate that the Index will increase moderately from the Starting Value to the Ending Value.
§ You are willing to risk a substantial loss of principal if the Index decreases from the Starting Value to an Ending Value that is below the Threshold Value.
§ You accept that the return on the notes will be capped.
§ You are willing to forgo the interest payments that are paid on conventional interest bearing debt securities.
§ You are willing to forgo dividends or other benefits of owning the stocks included in the Index.
§ You are willing to accept a limited or no market for sales prior to maturity, and understand that the market prices for the notes, if any, will be affected by various factors, including our actual and perceived creditworthiness, our internal funding rate and fees and charges on the notes.
§ You are willing to assume our credit risk, as issuer of the notes, for all payments under the notes, including the Redemption Amount.

The notes may not be an appropriate investment for you if:

§ You believe that the Index will decrease from the Starting Value to the Ending Value or that it will not increase sufficiently over the term of the notes to provide you with your desired return.
§ You seek 100% principal repayment or preservation of capital.
§ You seek an uncapped return on your investment.
§ You seek interest payments or other current income on your investment.
§ You want to receive dividends or other distributions paid on the stocks included in the Index.
§ You seek an investment for which there will be a liquid secondary market.
§ You are unwilling or are unable to take market risk on the notes or to take our credit risk as issuer of the notes.

We urge you to consult your investment, legal, tax, accounting, and other advisors before you invest in the notes.

Capped Leveraged Index Return Notes®
Linked to the S&P 500® Index due November , 2020
Hypothetical Payout Profile and Examples of Payments at Maturity
The graph below is based on hypothetical numbers and values.

| Capped Leveraged Index Return Notes® | This graph reflects the returns on the notes, based on the Participation Rate of 150%, the Threshold Value of 90% of the Starting Value and a hypothetical Capped Value of $11.60 (the midpoint of the Capped Value range of [$11.40 to $11.80]). The green line reflects the returns on the notes, while the dotted gray line reflects the returns of a direct investment in the stocks included in the Index, excluding dividends.<br><br>This graph has been prepared for purposes of illustration only. |
|---|---|

The following table and examples are for purposes of illustration only. They are based on hypothetical values and show hypothetical returns on the notes. They illustrate the calculation of the Redemption Amount and total rate of return based on a hypothetical Starting Value of 100, a hypothetical Threshold Value of 90, the Participation Rate of 150%, a hypothetical Capped Value of $11.60 per unit and a range of hypothetical Ending Values. The actual amount you receive and the resulting total rate of return will depend on the actual Starting Value, Threshold Value, Ending Value, Capped Value, and whether you hold the notes to maturity. The following examples do not take into account any tax consequences from investing in the notes.

For recent actual levels of the Market Measure, see "The Index" section below. The Index is a price return index and as such the Ending Value will not include any income generated by dividends paid on the stocks included in the Index, which you would otherwise be entitled to receive if you invested in those stocks directly. In addition, all payments on the notes are subject to issuer credit risk.

| Ending Value | Percentage Change from the Starting Value to the Ending Value | Redemption Amount per Unit | Total Rate of Return on the Notes |
|---|---|---|---|
| 0.00 | -100.00% | $1.00 | -90.00% |
| 50.00 | -50.00% | $6.00 | -40.00% |
| 80.00 | -20.00% | $9.00 | -10.00% |
| 90.00 | -10.00% | $10.00 | 0.00% |
| 94.00 | -6.00% | $10.00 | 0.00% |
| 95.00(1) | -5.00% | $10.00 | 0.00% |
| 97.00 | -3.00% | $10.00 | 0.00% |
| 100.00(2) | 0.00% | $10.00 | 0.00% |
| 102.00 | 2.00% | $10.30 | 3.00% |
| 105.00 | 5.00% | $10.75 | 7.50% |
| 110.00 | 10.00% | $11.50 | 15.00% |
| 120.00 | 20.00% | $11.60(3) | 16.00% |
| 130.00 | 30.00% | $11.60 | 16.00% |
| 140.00 | 40.00% | $11.60 | 16.00% |
| 150.00 | 50.00% | $11.60 | 16.00% |
| 160.00 | 60.00% | $11.60 | 16.00% |

(1) This is the hypothetical Threshold Value.
(2) The hypothetical Starting Value of 100 used in these examples has been chosen for illustrative purposes only, and does not represent a likely actual Starting Value for the Market Measure.
(3) The Redemption Amount per unit cannot exceed the hypothetical Capped Value.

Capped Leveraged Index Return Notes®
Linked to the S&P 500® Index due November , 2020
Redemption Amount Calculation Examples

Example 1

The Ending Value is 80.00, or 80.00% of the Starting Value:

Starting Value: 100.00

Threshold Value: 90.00

Ending Value: 80.00

Redemption Amount per unit

Example 2

The Ending Value is 95.00, or 95.00% of the Starting Value:

Starting Value: 100.00

Threshold Value: 90.00

Ending Value: 95.00

Redemption Amount (per unit) = $10.00, the principal amount, since the Ending Value is less than the Starting Value but equal to or greater than the Threshold Value.

Example 3

The Ending Value is 105.00, or 105.00% of the Starting Value:

Starting Value: 100.00

Ending Value: 105.00

= $10.75 Redemption Amount per unit

Example 4

The Ending Value is 130.00, or 130.00% of the Starting Value:

Starting Value: 100.00

Ending Value: 130.00

= $14.50, however, because the Redemption Amount for the notes cannot exceed the Capped Value, the Redemption Amount will be $11.60 per unit

Capped Leveraged Index Return Notes®
Linked to the S&P 500® Index due November , 2020

Risk Factors

There are important differences between the notes and a conventional debt security. An investment in the notes involves significant risks, including those listed below. You should carefully review the more detailed explanation of risks relating to the notes in the "Risk Factors" sections beginning on page PS-6 of product prospectus supplement EQUITY INDICES LIRN-1, page S-2 of the prospectus supplement, and page 6 of the prospectus identified above. We also urge you to consult your investment, legal, tax, accounting, and other advisors before you invest in the notes.

§ Depending on the performance of the Index as measured shortly before the maturity date, your investment may result in a loss; there is no guaranteed return of principal.

§ Your return on the notes may be less than the yield you could earn by owning a conventional fixed or floating rate debt security of comparable maturity.

§ Payments on the notes are subject to our credit risk, and actual or perceived changes in our creditworthiness are expected to affect the value of the notes. If we become insolvent or are unable to pay our obligations, you may lose your entire investment.

§ Your investment return is limited to the return represented by the Capped Value and may be less than a comparable investment directly in the stocks included in the Index.

§ Our initial estimated value of the notes will be lower than the public offering price of the notes. Our initial estimated value of the notes is only an estimate. The public offering price of the notes will exceed our initial estimated value because it includes costs associated with selling and structuring the notes, as well as hedging our obligations under the notes with a third party, which may include MLPF&S or one of its affiliates. These costs include the underwriting discount and an expected hedging related charge, as further described in "Structuring the Notes" on page TS-14.

§ Our initial estimated value of the notes does not represent future values of the notes and may differ from others' estimates. Our initial estimated value of the notes is determined by reference to our internal pricing models when the terms of the notes are set. These pricing models consider certain factors, such as our internal funding rate on the pricing date, the expected term of the notes, market conditions and other relevant factors existing at that time, and our assumptions about market parameters, which can include volatility, dividend rates, interest rates and other factors. Different pricing models and assumptions could provide valuations for the notes that are different from our initial estimated value. In addition, market conditions and other relevant factors in the future may change, and any of our assumptions may prove to be incorrect. On future dates, the market value of the notes could change significantly based on, among other things, the performance of the Index, changes in market conditions, our creditworthiness, interest rate movements and other relevant factors. These factors, together with various credit, market and economic factors over the term of the notes, are expected to reduce the price at which you may be able to sell the notes in any secondary market and will affect the value of the notes in complex and unpredictable ways. Our initial estimated value does not represent a minimum price at which we or any agents would be willing to buy your notes in any secondary market (if any exists) at any time.

§ Our initial estimated value is not determined by reference to credit spreads or the borrowing rate we would pay for our conventional fixed-rate debt securities. The internal funding rate used in the determination of our initial estimated value of the notes generally represents a discount from the credit spreads for our conventional fixed-rate debt securities and the borrowing rate we would pay for our conventional fixed-rate debt securities. If we were to use the interest rate implied by the credit spreads for our conventional fixed-rate debt securities, or the borrowing rate we would pay for our conventional fixed-rate debt securities, we would expect the economic terms of the notes to be more favorable to you. Consequently, our use of an internal funding rate for the notes would have an adverse effect on the economic terms of the notes, the initial estimated value of the notes on the pricing date, and the price at which you may be able to sell the notes in any secondary market.

§ A trading market is not expected to develop for the notes. Neither we nor MLPF&S is obligated to make a market for, or to repurchase, the notes. There is no assurance that any party will be willing to purchase your notes at any price in any secondary market.

§ Our business, hedging and trading activities, and those of MLPF&S and our respective affiliates (including trades in shares of companies included in the Index), and any hedging and trading activities we, MLPF&S or

our respective affiliates engage in for our clients' accounts, may affect the market value and return of the notes and may create conflicts of interest with you.

§ The Index sponsor may adjust the Index in a way that may adversely affect its level and your interests, and the Index sponsor has no obligation to consider your interests.

§ You will have no rights of a holder of the securities included in the Index, and you will not be entitled to receive securities or dividends or other distributions by the issuers of those securities.

§ While we, MLPF&S or our respective affiliates may from time to time own securities of companies included in the Index, except to the extent that the common stock of Bank of America Corporation (the parent company of MLPF&S) is included in the Index, we, MLPF&S and our respective affiliates do not control any company included in the Index, and have not verified any disclosure made by any other company.

§ There may be potential conflicts of interest involving the calculation agent, which is MLPF&S. We have the right to appoint and remove the calculation agent.

- The U.S. federal income tax consequences of the notes are uncertain, and may be adverse to a holder of the notes. See "Summary of U.S. Federal Income Tax Consequences" below.
- The conclusion that no portion of the interest paid or credited or deemed to be paid or credited on a note will be "Participating Debt Interest" subject to Canadian withholding tax is based in part on the current published administrative position of the CRA. There cannot be any assurance that CRA's current published administrative practice will not be subject to change, including potential expansion in the current administrative interpretation of Participating Debt Interest subject to Canadian withholding tax. If, at any time, the interest paid or credited or deemed to be paid or credited on a note is subject to Canadian withholding tax, you will receive an amount that is less than the Redemption Amount. You should consult your own adviser as to the potential for such withholding and the potential for reduction or refund of part or all of such withholding, including under any bilateral Canadian tax treaty the benefits of which you may be entitled. For a discussion of the Canadian federal income tax consequences of investing in the notes, see "Summary of Canadian Federal Income Tax Consequences" below, "Canadian Taxation—Debt Securities" on page 50 of the prospectus dated February 1, 2017, and "Supplemental Discussion of Canadian Federal Income Tax Consequences" on page PS-27 of product prospectus supplement EQUITY INDICES LIRN-1.

Capped Leveraged Index Return Notes®
Linked to the S&P 500® Index due November , 2020

The Index

All disclosures contained in this term sheet regarding the Index, including, without limitation, its make up, method of calculation, and changes in its components, have been derived from publicly available sources. The information reflects the policies of, and is subject to change by, S&P Dow Jones Indices LLC (the “Index sponsor”). The Index sponsor, which licenses the copyright and all other rights to the Index, has no obligation to continue to publish, and may discontinue publication of, the Index. The consequences of the Index sponsor discontinuing publication of the Index are discussed in the section entitled "Description of LIRNs- Discontinuance of an Index" beginning on page PS-20 of product prospectus supplement EQUITY INDICES LIRN-1. None of us, the calculation agent, or MLPF&S accepts any responsibility for the calculation, maintenance or publication of the Index or any successor index.

General

The Index includes a representative sample of 500 leading companies in leading industries of the U.S. economy. The Index is designed to provide a performance benchmark for the U.S. equity markets. The Index is calculated based on the relative value of the aggregate Market Value (as defined below) of the common stocks of 500 companies as of a particular time as compared to the aggregate average Market Value of the common stocks of 500 similar companies during the base period of the years 1941 through 1943. The “Market Value” of any index stock is the product of the market price per share times the number of the then outstanding shares of such index stock. The 500 companies are not the 500 largest companies listed on the NYSE and not all 500 companies are listed on such exchange. The Index sponsor chooses companies for inclusion in the Index with an aim of achieving a distribution by broad industry groupings that approximates the distribution of these groupings in the common stock population of the U.S. equity market.

As of October 31, 2018, the 500 companies included in the Index were divided into eleven Global Industry Classification Sectors. The Global Industry Classification Sectors include (with the approximate percentage currently included in such sectors indicated in parentheses): Information Technology (20.7%); Health Care (15.0%); Financials (13.6%); Communication Services (10.1%); Consumer Discretionary (9.8%); Industrials (9.3%); Consumer Staples (7.4%); Energy (5.7%); Utilities (3.1%); Real Estate (2.8%); and Materials (2.6%). (Sector designations are determined by the Index sponsor using criteria it has selected or developed. Different index sponsors may use very different standards for determining sector designations. In addition, many companies operate in a number of sectors, but are listed in only one sector and the basis on which that sector is selected may also differ. As a result, sector comparisons between indices with different index sponsors may reflect differences in methodology as well as actual differences in the sector composition of the indices.) As of the close of business on September 21, 2018, the Index Sponsor and MSCI, Inc. updated the Global Industry Classification Sector (“GICS”) structure. Among other things, the update broadened the Telecommunications Services sector and renamed it the Communication Services sector. The renamed sector includes the previously existing Telecommunication Services Industry group, as well as the Media Industry group, which was moved from the Consumer Discretionary sector and renamed the Media & Entertainment Industry group. The Media & Entertainment Industry group contains three industries: Media, Entertainment and Interactive Media & Services. The Media industry continues to consist of the Advertising, Broadcasting, Cable & Satellite and Publishing sub-industries. The Entertainment industry contains the Movies & Entertainment subindustry (which includes online entertainment streaming companies in addition to companies previously classified in such industry prior to September 21, 2018) and the Interactive Home Entertainment subindustry (which includes companies previously classified in the Home Entertainment Software subindustry prior to September 21, 2018 (when the Home Entertainment Software sub-industry was a subindustry in the Information Technology sector), as well as producers of interactive gaming products, including mobile gaming applications). The Interactive Media & Services industry and sub-industry includes companies engaged in content and information creation or distribution through proprietary platforms, where revenues are derived primarily through pay-per-click advertisements, and includes search engines, social media and networking platforms, online classifieds and online review companies. The GICS structure changes were effective for the S&P 500® Index as of the open of business on September 24, 2018 to coincide with the September 2018 quarterly rebalancing.

Calculation of the Index

The Index is calculated using a base-weighted aggregate methodology. The Index is a price return index. The value of the Index on any day for which an index value is published is determined by a fraction, the numerator of which is the aggregate of the market price of each stock in the Index multiplied by the float-adjusted number of shares of such stock included in the Index, and the denominator of which is the divisor, which is described more fully below.

The Index is also sometimes called a “base-weighted index” because of its use of a divisor. The “divisor” is a value calculated by the Index sponsor that is intended to maintain conformity in index values over time and is adjusted for all changes in the index stocks’ share capital after the “base date.” The level of the Index reflects the total market value of all index stocks relative to the index’s base date of 1941-43. The Index sponsor set the base value of the Index on the base date at 10.

Maintenance of the Index

In order to keep the Index comparable over time, the Index sponsor engages in an index maintenance process. The Index maintenance process involves changing the constituents, adjusting the number of shares used to calculate the Index, monitoring and completing the adjustments for company additions and deletions, adjusting for stock splits and stock dividends and adjusting for other corporate actions.

Divisor Adjustments

The two types of adjustments primarily used by the Index sponsor are divisor adjustments and adjustments to the number of shares (including float adjustments) used to calculate the Index. Set forth below is a table of certain corporate events and their resulting effect on the divisor and the share count. If a corporate event requires an adjustment to the divisor, that event has the effect of altering the

market value of the affected index stock and consequently of altering the aggregate market value of the index stocks following the event. In order that the level of the Index not be affected by the altered market value (which could be an increase or decrease) of the affected index stock, the Index sponsor derives a new divisor by dividing the post-event market value of the index stocks by the pre-event index value, which has the effect of reducing the Index's post-event value to the pre-event level.

Constituent Changes

Constituent changes are made on an as-needed basis and there is no schedule for constituent reviews. Constituent changes are generally announced one to five business days prior to the change. Relevant criteria for additions to the Index that are employed by the Index sponsor include an unadjusted market capitalization of $6.1 billion or more (as of March 10, 2017), adequate liquidity, reasonable price, U.S. domicile, listing on a major exchange, public float of 50% or more, industry sector, financial viability and, for IPOs, a seasoning period of six to twelve months. Stocks are deleted from the Index when they are involved in mergers, acquisitions or significant restructurings such that they no longer meet the inclusion criteria, and when they violate one or more of the inclusion criteria. Companies that experience a trading halt may be retained or deleted in the Index sponsor's discretion. The Index sponsor evaluates additions and deletions with a view to maintaining Index continuity.

Changes to the Number of Shares of a Constituent

The index maintenance process also involves tracking the changes in the number of shares included for each of the index companies. The timing of adjustments to the number of shares depends on the type of event causing the change, public availability of data, local market practice, and whether the change represents more than 5% of the float-adjusted share count. Changes as a result of mergers or acquisitions are implemented as soon as reasonably possible, regardless of the size of the change to the number of shares. At the Index sponsor's discretion, however, de minimis merger and acquisition changes may be accumulated and implemented with the updates made at the quarterly share updates as described below.

Changes that result from other corporate actions will be implemented as soon as practicable if the change to the float-adjusted share count is more than 5%. For smaller changes, on the third Friday of the last month in each calendar quarter, the Index sponsor updates the share totals of companies in the Index as required by any changes in the float-adjusted number of shares outstanding. The Index sponsor implements a share freeze the week leading up to the effective date of the quarterly share count updates. During this frozen period, shares are not changed except for certain corporate action events (merger activity, stock splits, rights offerings and certain share dividend payable events). After the float-adjusted share count totals are updated, the divisor is adjusted to compensate for the net change in the total market value of the Index. In addition, any changes over 5% in the current common shares outstanding for the index companies are carefully reviewed by the Index sponsor on a weekly basis, and when appropriate, an immediate adjustment is made to the divisor.

In addition, the Index is float-adjusted, meaning that the share counts used in calculating the Index reflect only those shares available to investors rather than all of a company's outstanding shares. To this end, the Index sponsor defines three groups of shareholders whose holdings are presumed to be for control, rather than investment purposes. The groups are:

- holdings by other publicly traded corporations, venture capital firms, private equity firms, or strategic partners or leveraged buyout groups;
- holdings by government entities, including all levels of government within the United States or foreign countries, except for pension and retirement funds; and
- holdings by current or former officers and directors of the company, funders of the company, or family trusts of officers, directors or founders. Second, holdings of trusts, foundations, pension funds, employee stock ownership plans or other investment vehicles associated with and controlled by the company.

In the case that any of these control groups hold 5% or more of a company's stock, the shares of all three groups will be excluded from the float-adjusted share count to be used in Index calculations.

For each stock an Investable Weight Factor ("IWF") is calculated:

IWF = (available float shares)/(total shares outstanding)

where available float shares is defined as total shares outstanding less shares held in one or more of the three groups listed above (subject to the 5% threshold).

Adjustments for Corporate Actions

There are a large range of corporate actions that may affect companies included in the Index. Certain corporate actions require the Index sponsor to recalculate the share count or the float adjustment or to make an adjustment to the divisor to prevent the value of the Index from changing as a result of the corporate action. This helps ensure that the movement of the Index does not reflect the corporate actions of individual companies in the Index. Several types of corporate actions, and their related adjustments, are listed in the table below.

Capped Leveraged Index Return Notes®
Linked to the S&P 500® Index due November , 2020

| Corporate Action | Share Count Revision Required? | Divisor Adjustment Required? |
|---|---|---|
| Stock split | Yes - share count is revised to reflect new count | No - share count and price changes are off-setting |
| Change in shares outstanding (secondary issuance, share repurchase and/or share buy-back) | Yes - share count is revised to reflect new count | Yes - divisor adjustment reflects change in market capitalization |
| Spin-off if spun-off company is not being added to the Index | No | Yes - divisor adjustment reflects decline in index market value (i.e. value of the spun-off unit) |
| Spin-off if spun-off company is being added to the Index and no company is being removed | No | No |
| Spin-off if spun-off company is being added to the Index and another company is being removed | No | Yes - divisor adjustment reflects deletion |
| Special dividends | No | Yes - calculation assumes that share price drops by the amount of the dividend; divisor adjustment reflects this change in index market value |
| Change in IWF | No | Yes - divisor change reflects the change in market value caused by the change to an IWF |
| Company added to or deleted from the Index | No. | Yes - divisor is adjusted by the net change in market value |

| Rights offering | No. | Yes - divisor adjustment reflects increase in market capitalization (calculation assumes that offering is fully subscribed at the set price) |
|---|---|---|

Disruptions due to Exchange Closure

When an exchange is forced to close early due to unforeseen events, such as computer or electric power failures, weather conditions or other events, the Index sponsor will calculate the closing level of the Index based on (1) the closing prices published by the exchange, or (2) if no closing price is available, the last regular trade reported for each stock before the exchange closed. In all cases, the prices will be from the primary exchange for each stock in the Index. If an exchange fails to open due to unforeseen circumstances, the Index will use the prior day's closing prices. If all exchanges fail to open, Standard & Poor's may determine not to publish the Index for that day.

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The following graph shows the daily historical performance of the Index in the period from January 1, 2008 through November 8, 2018. We obtained this historical data from Bloomberg L.P. We have not independently verified the accuracy or completeness of the information obtained from Bloomberg L.P. On November 8, 2018, the closing level of the Index was 2,806.83.

Historical Performance of the Index

This historical data on the Index is not necessarily indicative of the future performance of the Index or what the value of the notes may be. Any historical upward or downward trend in the level of the Index during any period set forth above is not an indication that the level of the Index is more or less likely to increase or decrease at any time over the term of the notes.

Before investing in the notes, you should consult publicly available sources for the levels of the Index.

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The notes are not sponsored, endorsed, sold or promoted by S&P Dow Jones Indices LLC, Dow Jones, S&P or any of their respective affiliates (collectively, "S&P Dow Jones Indices"). S&P Dow Jones Indices make no representation or warranty, express or implied, to the holders of the notes or any member of the public regarding the advisability of investing in securities generally or in the notes particularly or the ability of the Index to track general market performance. S&P Dow Jones Indices' only relationship to us with respect to the Index is the licensing of the Index and certain trademarks, service marks and/or trade names of S&P Dow Jones Indices and/or its third party licensors. The Index is determined, composed and calculated by S&P Dow Jones Indices without regard to us, MLPF&S. or the notes. S&P Dow Jones Indices have no obligation to take our needs or the needs of holders of the notes into consideration in determining, composing or calculating the Index. S&P Dow Jones Indices are not responsible for and have not participated in the determination of the prices, and amount of the notes or the timing of the issuance or sale of the notes or in the determination or calculation of the equation by which the notes are to be converted into cash. S&P Dow Jones Indices have no obligation or liability in connection with the administration, marketing or trading of the notes. There is no assurance that investment products based on the Index will accurately track index performance or provide positive investment returns. S&P Dow Jones Indices LLC is not an investment advisor. Inclusion of a security or futures contract within an index is not a recommendation by S&P Dow Jones Indices to buy, sell, or hold such security or futures contract, nor is it considered to be investment advice. Notwithstanding the foregoing, CME Group Inc. and its affiliates may independently issue and/or sponsor financial products unrelated to the notes currently being issued by us, but which may be similar to and competitive with the notes. In addition, CME Group Inc. and its affiliates may trade financial products which are linked to the performance of the Index. It is possible that this trading activity will affect the value of the notes.

S&P DOW JONES INDICES DO NOT GUARANTEE THE ADEQUACY, ACCURACY, TIMELINESS AND/OR THE COMPLETENESS OF THE INDEX OR ANY DATA RELATED THERETO OR ANY COMMUNICATION, INCLUDING BUT NOT LIMITED TO, ORAL OR WRITTEN COMMUNICATION (INCLUDING ELECTRONIC COMMUNICATIONS) WITH RESPECT THERETO. S&P DOW JONES INDICES SHALL NOT BE SUBJECT TO ANY DAMAGES OR LIABILITY FOR ANY ERRORS, OMISSIONS, OR DELAYS THEREIN. S&P DOW JONES INDICES MAKE NO EXPRESS OR IMPLIED WARRANTIES, AND EXPRESSLY DISCLAIMS ALL WARRANTIES, OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR USE OR AS TO RESULTS TO BE OBTAINED BY US, MLPF&S, HOLDERS OF THE NOTES, OR ANY OTHER PERSON OR ENTITY FROM THE USE OF THE INDEX OR WITH RESPECT TO ANY DATA RELATED THERETO. WITHOUT LIMITING ANY OF THE FOREGOING, IN NO EVENT WHATSOEVER SHALL S&P DOW JONES INDICES BE LIABLE FOR ANY INDIRECT, SPECIAL, INCIDENTAL, PUNITIVE, OR CONSEQUENTIAL DAMAGES INCLUDING BUT NOT LIMITED TO, LOSS OF PROFITS, TRADING LOSSES, LOST TIME OR GOODWILL, EVEN IF THEY HAVE BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES, WHETHER IN CONTRACT, TORT, STRICT LIABILITY, OR OTHERWISE. THERE ARE NO THIRD PARTY BENEFICIARIES OF ANY AGREEMENTS OR ARRANGEMENTS BETWEEN S&P DOW JONES INDICES AND US, OTHER THAN THE LICENSORS OF S&P DOW JONES INDICES.

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Supplement to the Plan of Distribution

Under our distribution agreement with MLPF&S, MLPF&S will purchase the notes from us as principal at the public offering price indicated on the cover of this term sheet, less the indicated underwriting discount.

The current business of MLPF&S is being reorganized into two affiliated broker-dealers: MLPF&S and a new broker-dealer, BofAML Securities, Inc. ("BofAMLS"). BofAMLS will be the new legal entity for the institutional services that are now provided by MLPF&S. MLPF&S will be assigning its rights and obligations as selling agent for the notes under our distribution agreement to BofAMLS effective on the "Transfer Date". Accordingly, if the pricing date of the notes occurs on or after the Transfer Date, BofAMLS will be responsible for the pricing of the notes. If the settlement date of the notes occurs on or after the Transfer Date, BofAMLS will, subject to the terms and conditions of the distribution agreement, purchase the notes from us as principal on the settlement date. MLPF&S will in turn purchase the notes from BofAMLS for resale, and it will receive a selling concession in connection with the sale of the notes in an amount up to the full amount of underwriting discount set forth on the cover of this term sheet.

We may deliver the notes against payment therefor in New York, New York on a date that is greater than two business days following the pricing date. Under Rule 15c6-1 of the Securities Exchange Act of 1934, trades in the secondary market generally are required to settle in two business days, unless the parties to any such trade expressly agree otherwise. Accordingly, if the initial settlement of the notes occurs more than two business days from the pricing date, purchasers who wish to trade the notes more than two business days prior to the original issue date will be required to specify alternative settlement arrangements to prevent a failed settlement.

The notes will not be listed on any securities exchange. In the original offering of the notes, the notes will be sold in minimum investment amounts of 100 units. If you place an order to purchase the notes, you are consenting to MLPF&S acting as a principal in effecting the transaction for your account.

MLPF&S may repurchase and resell the notes, with repurchases and resales being made at prices related to then-prevailing market prices or at negotiated prices, and these prices will include MLPF&S's trading commissions and mark-ups. MLPF&S may act as principal or agent in these market-making transactions; however, it is not obligated to engage in any such transactions. At MLPF&S's discretion, for a short, undetermined initial period after the issuance of the notes, MLPF&S may offer to buy the notes in the secondary market at a price that may exceed the initial estimated value of the notes. Any price offered by MLPF&S for the notes will be based on then-prevailing market conditions and other considerations, including the performance of the Index and the remaining term of the notes. However, none of us, MLPF&S, or any of our respective affiliates is obligated to purchase your notes at any price or at any time, and we cannot assure you that we, MLPF&S or any of our respective affiliates will purchase your notes at a price that equals or exceeds the initial estimated value of the notes.

The value of the notes shown on your account statement produced by MLPF&S will be based on MLPF&S's estimate of the value of the notes if MLPF&S or another of its affiliates were to make a market in the notes, which it is not obligated to do. That estimate will be based upon the price that MLPF&S may pay for the notes in light of then-prevailing market conditions, and other considerations, as mentioned above, and will include transaction costs. At certain times, this price may be higher than or lower than the initial estimated value of the notes.

The distribution of the Note Prospectus in connection with these offers or sales will be solely for the purpose of providing investors with the description of the terms of the notes that was made available to investors in connection with their initial offering. Secondary market investors should not, and will not be authorized to, rely on the Note Prospectus for information regarding BNS or for any purpose other than that described in the immediately preceding sentence.

An investor's household, as referenced on the cover of this term sheet, will generally include accounts held by any of the following, as determined by MLPF&S in its discretion and acting in good faith based upon information then available to MLPF&S:

- the investor's spouse (including a domestic partner), siblings, parents, grandparents, spouse's parents, children and grandchildren, but excluding accounts held by aunts, uncles, cousins, nieces, nephews or any other family relationship not directly above or below the individual investor;
- a family investment vehicle, including foundations, limited partnerships and personal holding companies, but only if the beneficial owners of the vehicle consist solely of the investor or members of the investor's household as described

above; and

- a trust where the grantors and/or beneficiaries of the trust consist solely of the investor or members of the investor's household as described above; provided that, purchases of the notes by a trust generally cannot be aggregated together with any purchases made by a trustee's personal account.

Purchases in retirement accounts will not be considered part of the same household as an individual investor's personal or other non-retirement account, except for individual retirement accounts ("IRAs"), simplified employee pension plans ("SEPs"), savings incentive match plan for employees ("SIMPLEs"), and single-participant or owners only accounts (i.e., retirement accounts held by self-employed individuals, business owners or partners with no employees other than their spouses).

Please contact your Merrill Lynch financial advisor if you have any questions about the application of these provisions to your specific circumstances or think you are eligible.

## Structuring the Notes

The notes are our unsecured senior debt securities, the return on which is linked to the performance of the Index. As is the case for all of our debt securities, including our market-linked notes, the economic terms of the notes reflect our actual or perceived creditworthiness at the time of pricing. The internal funding rate we use in pricing the market-linked note is typically lower than the rate we would pay when we issue conventional fixed-rate debt securities of comparable maturity. This generally relatively lower internal funding rate, which is reflected in the economic terms of the notes, along with the fees and charges associated with market-linked notes, typically results in the initial estimated value of the notes on the pricing date being less than their public offering price.

At maturity, we are required to pay the Redemption Amount to holders of the notes, which will be calculated based on the performance of the Index and the $10 per unit principal amount. In order to meet these payment obligations, at the time we issue the notes, we may choose to enter into certain hedging arrangements (which may include call options, put options or other derivatives) with MLPF&S or one of its affiliates. The terms of these hedging arrangements are determined by seeking bids from market participants, including MLPF&S and its affiliates, and take into account a number of factors, including our creditworthiness, interest rate movements, the volatility of the Index, the tenor of the notes and the tenor of the hedging arrangements. The economic terms of the notes and their initial estimated value depend in part on the terms of these hedging arrangements.

MLPF&S has advised us that the hedging arrangements will include a hedging related charge of approximately $0.075 per unit, reflecting an estimated profit to be credited to MLPF&S from these transactions. Since hedging entails risk and may be influenced by unpredictable market forces, additional profits and losses from these hedging arrangements may be realized by MLPF&S or any third party hedge providers.

For further information, see “Risk Factors—General Risks Relating to LIRNs” beginning on page PS-6 and “Use of Proceeds and Hedging” on page PS-16 of product prospectus supplement EQUITY INDICES LIRN-1.

## MLPF&S Reorganization

As discussed above under “Supplement to the Plan of Distribution”, the current business of MLPF&S is being reorganized into two affiliated broker-dealers. Effective on the Transfer Date, BofAMLS will be the new legal entity for the institutional services that are now provided by MLPF&S. As such, beginning on the Transfer Date, the institutional services currently being provided by MLPF&S, including acting as selling agent for the notes, acting as calculation agent for the notes, acting as principal or agent in secondary market-making transactions for the notes and entering into hedging arrangements with respect to the notes, are expected to be provided by BofAMLS. Accordingly, references to MLPF&S in this term sheet as such references relate to MLPF&S’s institutional services, such as those described above, should be read as references to BofAMLS to the extent these services are to be performed on or after the Transfer Date.

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Summary of Canadian Federal Income Tax Consequences

An investor should read carefully the description of principal Canadian federal income tax considerations under "Canadian Taxation" in the accompanying prospectus relevant to a holder (as defined on page 19 of the prospectus) owning debt securities, and the description of principal Canadian federal income tax considerations under "Supplemental Discussion of Canadian Federal Income Tax Consequences" in the applicable product prospectus supplement.

Summary of U.S. Federal Income Tax Consequences

The following is a general description of certain U.S. federal tax considerations relating to the notes. Prospective purchasers of the notes should consult their tax advisors as to the consequences under the tax laws of the country of which they are residents for tax purposes and the tax laws of the U.S. of acquiring, holding and disposing of the notes and receiving payments under the notes. This summary is based upon the law as in effect on the date of this pricing supplement and is subject to any change in law that may take effect after such date. We urge you to read the more detailed discussion in the "Supplemental Discussion of U.S. Federal Income Tax Consequences" section beginning on page PS-28 of product prospectus supplement EQUITY INDICES LIRN-1.

No statutory, regulatory, judicial or administrative authority directly discusses how the notes should be treated for U.S. federal income tax purposes. As a result, the U.S. federal income tax consequences of your investment in the notes are uncertain. Accordingly, we urge you to consult your tax advisor as to the tax consequences of your investment in the notes (and of having agreed to the required tax treatment of your notes described below) and as to the application of state, local or other tax laws to your investment in your notes and the possible effects of changes in federal or other tax laws.

Pursuant to the terms of the notes, BNS and you agree, in the absence of a statutory or regulatory change or an administrative determination or judicial ruling to the contrary, to characterize your notes as a pre-paid derivative contract with respect to the Index. If your notes are so treated, you should generally recognize long-term capital gain or loss if you hold your notes for more than one year (and otherwise, short-term capital gain or loss) upon the taxable disposition of your notes in an amount equal to the difference between the amount you receive at such time and the amount you paid for your notes. The deductibility of capital losses is subject to limitations.

Based on certain factual representations received from us, our special U.S. Tax counsel, Cadwalader, Wickersham & Taft LLP, is of the opinion that it would be reasonable to treat your notes in the manner described above. However, because there is no authority that specifically addresses the tax treatment of the notes, it is possible that your notes could alternatively be treated for tax purposes as a single contingent payment debt instrument or pursuant to some other characterization, such that the timing and character of your income from the notes could differ materially and adversely from the treatment described above.

Possible Change in Law. In 2007, the Internal Revenue Service (the "IRS") released a notice that may affect the taxation of holders of the notes. According to the notice, the IRS and the U.S. Treasury Department (the "Treasury") are actively considering whether a holder of an instrument such as the notes should be required to accrue ordinary income on a current basis, and they are seeking taxpayer comments on the subject. It is not possible to determine what guidance they will ultimately issue, if any. It is possible, however, that under such guidance, holders of the notes will ultimately be required to accrue income currently and this could be applied on a retroactive basis. The IRS and the Treasury are also considering other relevant issues, including whether additional gain or loss from such instruments should be treated as ordinary or capital, whether foreign holders of such instruments should be subject to withholding tax on any deemed income accruals, and whether the special "constructive ownership rules" of Section 1260 of the Internal Revenue Code of 1986, as amended (the "Code") should be applied to such instruments.

Medicare Tax on Net Investment Income. U.S. holders that are individuals or estates and certain trusts are subject to an additional 3.8% tax on all or a portion of their "net investment income," or "undistributed net investment income" in the case of an estate or trust, which may include any income or gain with respect to the notes, to the extent of their net investment income or undistributed net investment income (as the case may be) that, when added to their other modified adjusted gross income, exceeds $200,000 for an unmarried individual, $250,000 for a married taxpayer filing a joint return (or a surviving spouse), $125,000 for a married individual filing a separate return, or the dollar amount at which the highest tax bracket begins for an estate or trust. The 3.8% Medicare tax is determined in a different manner

than the regular income tax. U.S. holders should consult their advisors with respect to the 3.8% Medicare tax.
Specified Foreign Financial Assets. U.S. holders may be subject to reporting obligations with respect to their notes if they do not hold their notes in an account maintained by a financial institution and the aggregate value of their notes and certain other "specified foreign financial assets" (applying certain attribution rules) exceeds an applicable threshold. Significant penalties can apply if a U.S. holder is required to disclose its notes and fails to do so.
Backup Withholding and Information Reporting. The proceeds received from a sale, exchange, redemption or maturity of the notes will be subject to information reporting unless you are an "exempt recipient" and may also be subject to backup withholding at the rate specified in the Code if you fail to provide certain identifying information (such as an accurate taxpayer number, if you are a U.S. holder) or meet certain other conditions.
Amounts withheld under the backup withholding rules are not additional taxes and may be refunded or credited against your U.S. federal income tax liability, provided the required information is furnished to the IRS.
Non-U.S. Holders. This section applies only if you are a non-U.S. holder. For these purposes, you are a non-U.S. holder if you are the beneficial owner of the notes and are, for U.S. federal income tax purposes:

- a non-resident alien individual;
- a foreign corporation; or
- an estate or trust that, in either case, is not subject to U.S. federal income tax on a net income basis on income or gain from the notes.

If you are a non-U.S. holder, subject to Section 871(m) of the Code and FATCA, discussed below, you should generally not be subject to generally applicable information reporting and backup withholding requirements with respect to payments on your notes if you comply with certain certification and identification requirements as to your foreign status including providing us (and/or the applicable withholding agent) a properly executed and fully completed applicable IRS Form W-8. Subject to Section 897 of the Code and Section 871(m) of the Code, discussed below, gain from the taxable disposition of a note generally will not be subject to U.S. tax unless (i) such gain is effectively connected with a trade or business conducted by you in the U.S., (ii) you are a non-resident alien individual and are present in the U.S. for 183 days or more during the taxable year of such taxable disposition and certain other conditions are satisfied or (iii) you have certain other present or former connections with the U.S.

Section 897. We will not attempt to ascertain whether the issuer of any underlying equity constituent of the Index would be treated as a "United States real property holding corporation" ("USRPHC") within the meaning of Section 897 of the Code. We also have not attempted to determine whether the Notes should be treated as "United States real property interests" ("USRPI") as defined in Section 897 of the Code. If an issuer of any underlying equity constituent of the Index or the notes were so treated, certain adverse U.S. federal income tax consequences could possibly apply, including subjecting any gain realized by a non-U.S. holder in respect of the notes upon a taxable disposition (including cash settlement) of the notes to U.S. federal income tax on a net basis, and the proceeds from such a taxable disposition to a withholding tax. Non-U.S. holders should consult their tax advisors regarding the potential treatment of any underlying equity constituent for their notes as a USRPHC or the notes as USRPI.

Section 871(m). A 30% withholding tax (which may be reduced by an applicable income tax treaty) is imposed under Section 871(m) of the Code on certain "dividend equivalents" paid or deemed paid to a non-U.S. holder with respect to a "specified equity-linked instrument" that references one or more dividend-paying U.S. equity securities or indices containing U.S. equity securities. The withholding tax can apply even if the instrument does not provide for payments that reference dividends. Treasury regulations provide that the withholding tax applies to all dividend equivalents paid or deemed paid on specified equity-linked instruments that have a delta of one ("delta one specified equity-linked instruments") issued after 2016 and to all dividend equivalents paid or deemed paid on all other specified equity-linked instruments issued after 2018. However, the IRS has issued guidance that states that the Treasury and the IRS intend to amend the effective dates of the Treasury regulations to provide that withholding on dividend equivalents paid or deemed paid will not apply to specified equity-linked instruments that are not delta one specified equity-linked instruments and are issued before January 1, 2021.

Based on our determination that the notes are not "delta-one" with respect to the Index or any U.S. Index components, our counsel is of the opinion that the notes should not be delta-one specified equity-linked instruments and thus should not be subject to withholding on dividend equivalents. Our determination is not binding on the IRS, and the IRS may disagree with this determination. Furthermore, the application of Section 871(m) of the Code will depend on our determinations made upon issuance of the notes. If withholding is required, we will not make payments of any additional amounts.

Nevertheless, after issuance, it is possible that your notes could be deemed to be reissued for tax purposes upon the occurrence of certain events affecting the Index or Index components or your notes, and following such occurrence your notes could be treated as delta-one specified equity-linked instruments that are subject to withholding on dividend equivalents. It is also possible that withholding tax or other tax under Section 871(m) of the Code could apply to the notes under these rules if a non-U.S. holder enters, or has entered, into certain other transactions in respect of the Index or Index components or the notes. A non-U.S. holder that enters, or has entered, into other transactions in respect of the Index or Index components or the notes should consult its tax advisor regarding the application of Section 871(m) of the Code to its notes in the context of its other transactions.

Because of the uncertainty regarding the application of the 30% withholding tax on dividend equivalents to the notes, you are urged to consult your tax advisor regarding the potential application of Section 871(m) of the Code and the

30% withholding tax to an investment in the notes.

U.S. Federal Estate Tax Treatment of Non-U.S. Holders. A note may be subject to U.S. federal estate tax if an individual non-U.S. holder holds the note at the time of his or her death. The gross estate of a non-U.S. holder domiciled outside the U.S. includes only property situated in the U.S. Individual non-U.S. holders should consult their tax advisors regarding the U.S. federal estate tax consequences of holding the notes at death.

FATCA. The Foreign Account Tax Compliance Act ("FATCA") was enacted on March 18, 2010, and imposes a 30% U.S. withholding tax on "withholdable payments" (i.e., certain U.S.-source payments, including interest (and original issue discount), dividends, other fixed or determinable annual or periodical gain, profits, and income, and on the gross proceeds from a disposition of property of a type which can produce U.S.-source interest or dividends) and "passthru payments" (i.e., certain payments attributable to withholdable payments) made to certain foreign financial institutions (and certain of their affiliates) unless the payee foreign financial institution agrees (or is required), among other things, to disclose the identity of any U.S. individual with an account at the institution (or the relevant affiliate) and to annually report certain information about such account. FATCA also requires withholding agents making withholdable payments to certain foreign entities that do not disclose the name, address, and taxpayer identification number of any substantial U.S. owners (or do not certify that they do not have any substantial U.S. owners) to withhold tax at a rate of 30%. Under certain circumstances, a holder may be eligible for refunds or credits of such taxes.

Pursuant to final and temporary Treasury regulations and other IRS guidance, the withholding and reporting requirements under FATCA will generally apply to certain “withholdable payments” made on or after July 1, 2014, certain gross proceeds on a sale or disposition occurring after December 31, 2018, and certain foreign passthru payments made after December 31, 2018 (or, if later, the date that final regulations defining the term “foreign passthru payment” are published). If withholding is required, we (or the applicable paying agent) will not be required to pay additional amounts with respect to the amounts so withheld. Foreign financial institutions and non-financial foreign entities located in jurisdictions that have an intergovernmental agreement with the U.S. governing FATCA may be subject to different rules.

Investors should consult their own advisors about the application of FATCA, in particular if they may be classified as financial institutions (or if they hold their notes through a non-U.S. entity) under the FATCA rules.

Both U.S. and non-U.S. holders should consult their tax advisors regarding the U.S. federal income tax consequences of an investment in the notes, as well as any tax consequences arising under the laws of any state, local or non-U.S. taxing jurisdiction (including that of BNS).

## Where You Can Find More Information

We have filed a registration statement (including a product prospectus supplement, a prospectus supplement, a prospectus addendum and a prospectus) with the SEC for the offering to which this term sheet relates. Before you invest, you should read the Note Prospectus, including this term sheet, and the other documents that we have filed with the SEC, for more complete information about us and this offering. You may get these documents without cost by visiting EDGAR on the SEC website at www.sec.gov. Alternatively, we, any agent, or any dealer participating in this offering will arrange to send you these documents if you so request by calling MLPF&S toll-free at 1-800-294-1322.

## Market-Linked Investments Classification

MLPF&S classifies certain market-linked investments (the “Market-Linked Investments”) into categories, each with different investment characteristics. The following description is meant solely for informational purposes and is not intended to represent any particular Enhanced Return Market-Linked Investment or guarantee any performance.

Enhanced Return Market-Linked Investments are short- to medium-term investments that offer you a way to enhance exposure to a particular market view without taking on a similarly enhanced level of market downside risk. They can be especially effective in a flat to moderately positive market (or, in the case of bearish investments, a flat to moderately negative market). In exchange for the potential to receive better-than market returns on the linked asset, you must generally accept market downside risk and capped upside potential. As these investments are not market downside protected, and do not assure full repayment of principal at maturity, you need to be prepared for the possibility that you may lose all or part of your investment.

"Leveraged Index Return Notes®" and "LIRNs®" are registered service marks of Bank of America Corporation, the parent company of MLPF&S.



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Office equipment

$

| | |
|---|---|
| | 60,731 |
| $ | |
| | 55,817 |
| Lab equipment | |
| | 947,084 |
| | 789,135 |
| Furniture | |
| | 32,693 |
| | 32,693 |
| Leasehold Improvements | |

231,859

231,859

1,272,367

1,109,504

Less: Accumulated depreciation

773,767

683,854

$

498,600

$

425,650

Depreciation expense for the six months ending June 30, 2017 and 2016 was $89,912 and $89,627. Depreciation expense for the three months ending June 30, 2017 and 2016 was $45,034 and $44,169. During the three months ended June 30, 2016, the company sold equipment for proceeds of $19,500 and a gain of $644.

**NOTE 4 INTANGIBLE ASSETS**

This represents legal fees and patent fees associated with the prosecution of patent applications. The Company has recorded amortization expenses on patents granted, which are amortized over the remaining legal life. Maintenance patent fees are paid to a government patent authority to maintain a granted patent in force. Some countries require the payment of maintenance fees for pending patent applications. Maintenance fees paid after a patent is granted are expensed, as these are considered ongoing costs to maintain a patent . Maintenance fees paid prior to a patent grant

date are capitalized to patent costs, as these are considered patent application costs . No amortization expense has been recorded on the remaining patent applications since patents have yet to be granted.

Patents consist of the following:

| | | June 30, 2017 | | December 31, 2016 |
|---|---|---|---|---|
| Patents | $ | 781,675 | $ | 754,259 |
| Less: Accumulated amortization | | 154,534 | | 86,287 |
| | $ | 627,141 | $ | 667,972 |

Amortization expense for the six months ending June 30, 2017 and 2016 was $62,901 and $7,946. Amortization expense for the three months ending June 30, 2017 and 2016 was $58,928 and $3,973. Expense for abandoned patents for the three months ending June 30, 2017 and 2016 was $0 and $0.

**NOTE 5 LONG TERM EQUIPMENT PURCHASE PAYABLE**

Outstanding long term equipment purchase payable is comprised of the following:

| Final Year of Maturity | Interest Rate | June 30, 2017 | December 31, 2016 |
|---|---|---|---|
| 2018 | 0.00% | $29,732 | $ |

**LIGHTWAVE LOGIC, INC.**

**NOTES TO FINANCIAL STATEMENTS**

**JUNE 30, 2017 AND 2016**

## NOTE 6 INCOME TAXES

There is no income tax benefit for the losses for the three and six months ended June 30, 2017 and 2016 since management has determined that the realization of the net deferred tax asset is not assured and has created a valuation allowance for the entire amount of such benefits.

The Company s policy is to record interest and penalties associated with unrecognized tax benefits as additional income taxes in the statement of operations. As of January 1, 2017, the Company had no unrecognized tax benefits, or any tax related interest or penalties. There were no changes in the Company s unrecognized tax benefits during the period ended June 30, 2017. The Company did not recognize any interest or penalties during 2017 related to unrecognized tax benefits. With few exceptions, the U.S. and state income tax returns filed for the tax years ending on December 31, 2013 and thereafter are subject to examination by the relevant taxing authorities.

## NOTE 7 STOCKHOLDERS EQUITY

### Preferred Stock

Pursuant to the Company s Articles of Incorporation, the Company s board of directors is empowered, without stockholder approval, to issue series of preferred stock with any designations, rights and preferences as they may from time to time determine. The rights and preferences of this preferred stock may be superior to the rights and preferences of the Company s common stock; consequently, preferred stock, if issued could have dividend, liquidation, conversion, voting or other rights that could adversely affect the voting power or other rights of the common stock. Additionally, preferred stock, if issued, could be utilized, under special circumstances, as a method of discouraging, delaying or preventing a change in control of the Company s business or a takeover from a third party.

### Common Stock Options and Warrants

In May 2014, under the 2007 Employee Stock Option Plan the Company issued an option to a new director to purchase 200,000 shares of common stock at a purchase price of $0.763 per share. The option was valued at $122,515, fair value, using the Black-Scholes Option Pricing Formula. The option expires in 10 years with 50,000 vesting immediately and the remainder vesting in annual equal installments of 50,000 commencing on the one year anniversary of the date of grant. The option is expensed over the vesting term. In July 2016, the option to purchase 50,000 shares of common stock forfeited. In October 2016, the option to purchase 150,000 shares of common stock forfeited. For the three months ended June 30, 2017 the Company recognized $0 of expense. During the six months ending June 30, 2017, the Company reduced amortization by $19,718.

During August 2015, under the 2007 Employee Stock Option Plan, the Company issued an option to a new director to purchase 200,000 shares of common stock at a purchase price of $0.69 per share. The option was valued at $90,615, fair value, using the Black-Scholes Option Pricing Formula. The option expires in 10 years and vests 50,000 immediately and the remaining in equal annual installments of 50,000 over the next three years. The option is expensed over the vesting term. For the three and six months ending June 30, 2017, the Company recognized $5,648 and $11,234 of expense. As of June 30, 2017, the option to purchase 200,000 shares of common stock is still outstanding.

During October 2015, under the 2007 Employee Stock Option Plan, the Company issued an option to a new employee to purchase 35,000 shares of common stock at a purchase price of $0.74 per share. The option was valued at $16,393, fair value, using the Black-Scholes Option Pricing Formula. The option expires October 12, 2025 with 4,375 shares vesting on the anniversary date of the third month of employment and the remaining vesting in seven equal installments of 4,375 at the end of every three month period thereafter. The option is expensed over the vesting term. For the three and six months ending June 30, 2017, the Company recognized $2,046 and $4,089 of expense. As of June 30, 2017, the option to purchase 35,000 shares of common stock is still outstanding.



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**LIGHTWAVE LOGIC, INC.**

**NOTES TO FINANCIAL STATEMENTS**

**JUNE 30, 2017 AND 2016**

## NOTE 7 STOCKHOLDERS EQUITY (CONTINUED)

### Common Stock Options and Warrants (Continued)

During November 2015, under the 2007 Employee Stock Option Plan, the Company issued an option effective January 1, 2016 to the Chief Executive Officer to purchase 100,000 shares of common stock at a purchase price of $0.86 per share. The option expires November 9, 2025 with 12,500 shares vesting on January 1, 2016 and the remaining vesting quarterly in equal installments of 12,500 commencing April 1, 2016. The option was valued at $33,108, fair value, using the Black-Scholes Option Pricing Formula. The option is expensed over the vesting term. For the three and six months ending June 30, 2017, the Company recognized $4,139 and $8,277 of expense. As of June 30, 2017, the option to purchase 100,000 shares of common stock is still outstanding.

In January 2016, the Company signed a Purchase Agreement with an institutional investor to sell up to $20,000,000 of common stock. The Company also entered into a registration rights agreement with the institutional investor whereby the Company agreed to file a registration statement related to the transaction with the U.S. Securities and Exchange Commission registering 5,000,000 shares of the Company s common stock. The registration statement was filed on March 25, 2016. The registration statement became effective April 7, 2016. Under the Purchase Agreement and at Company's sole discretion, the institutional investor has committed to invest up to $20,000,000 in common stock over a 36-month period. The Company issued 350,000 shares of restricted common stock to the institutional investor as an initial commitment fee valued at $237,965, fair value, and 650,000 shares of common stock are reserved for additional commitment fees to the institutional investor in accordance with the terms of the Purchase Agreement. During the period August 2016 through June 30 2017, the institutional investor purchased 4,400,000 shares of common stock for proceeds of $3,209,950 and the Company issued 104,326 shares of common stock as additional commitment fee, valued at $87,841, fair value, leaving 545,674 in reserve for additional commitment fees. For the three months ending June 30, 2017, the institutional investor purchased 400,000 shares of common stock for proceeds of $584,600 and the Company issued 19,001 shares of common stock as additional commitment fee, valued at $29,168, fair value. For the six months ending June 30, 2017, the institutional investor purchased 2,000,000 shares of common stock for proceeds of $1,656,760 and the Company issued 53,845 shares of common stock as additional commitment fee, valued at $53,921, fair value. During July and August 2017, the institutional investor purchased 800,000 shares of common stock for proceeds of $935,600 and the Company issued 30,408 shares of common stock as additional commitment fee, valued at $37,164, fair value, leaving 515,266 in reserve for additional commitment fees.

In February 2016, under the 2007 Employee Stock Option Plan, the Company issued an option to an independent director purchase 50,000 shares of common stock at a purchase price of $0.68 per share. The option was valued at $21,475, fair value, using the Black-Scholes Option Pricing Formula. The option expires in 10 years and vests 20,000 immediately and the remaining in quarterly equal installments of 10,000 commencing April 1, 2016. The option is expensed over the vesting terms. In July 2016, the option to purchase 10,000 shares of common stock forfeited. For the three months ended June 30, 2017 the Company recognized $0 of expense. During the six months ending June 30, 2017, Company reduced amortization by $4,295. As of June 30, 2017, the option to purchase 40,000 shares of common stock is still outstanding.

In May 2016, under the 2007 Employee Stock Option Plan, the Company issued an option to an employee to purchase 5,000 shares of common stock at a purchase price of $0.60 per share. The option was valued at $1,738, fair value, using the Black-Scholes Option Pricing Formula. The option expires in 10 years and vests in quarterly equal installments of 625 commencing August 4, 2016. The option is expensed over the vesting term. For the three and six months ending June 30, 2017, the Company recognized $218 and $435 of expense. As of June 30, 2017, the option to purchase 5,000 shares of common stock is still outstanding.

In July 2016, under the 2016 Equity Incentive Plan, the Company issued an option to a new employee to purchase 15,000 shares of common stock at a purchase price of $0.63 per share. The option was valued at $6,216, fair value, using the Black-Scholes Option Pricing Formula. The option expires in 10 years and vests in quarterly equal installments of 1,875 commencing on September 27, 2016. The option is expensed over the vesting term. For the three and six months ending June 30, 2017, the Company recognized $777 and $1,553 of expense. As of June 30, 2017, the option to purchase 15,000 shares of common stock is still outstanding.



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**LIGHTWAVE LOGIC, INC.**

**NOTES TO FINANCIAL STATEMENTS**

**JUNE 30, 2017 AND 2016**

**NOTE 7 STOCKHOLDERS EQUITY (CONTINUED)**

**Common Stock Options and Warrants (Continued)**

During July 2016, the Company issued a warrant to purchase 150,000 shares of common stock at a purchase price of $0.63 per share for accounting services to be rendered over a twelve month period commencing July 1, 2016. The warrant was valued at $60,272, fair value, using the Black-Scholes Option Pricing Formula, vesting over the next twelve months with 12,500 vesting immediately, 12,500 vesting per month on the first day of the next ten months and 12,500 vesting on the first day of the twelfth month of the corresponding service agreement. The warrant expires in five years. The expense is being recognized based on service terms of the agreement over a twelve month period. For the three and six months ending June 30, 2017, the Company recognized $24,344 and $40,238 of expense. As of June 30, 2017, the warrant to purchase 150,000 shares of common stock is still outstanding.

During November 2016, under the 2016 Equity Incentive Plan, the Company issued an option to an employee to purchase 15,000 shares of common stock at a purchase price of $0.60 per share. The option was valued at $5,674, fair value, using the Black-Scholes Option Pricing Formula. The option expires November 9, 2026 with 1,875 shares vesting on December 1, 2016 and the remaining vesting in seven equal quarterly installments of 1,875. The option is expensed over the vesting term. For the three and six months ending June 30, 2017, the Company recognized $702 and $1,406 of expense. As of June 30, 2017, the option to purchase 15,000 shares of common stock is still outstanding.

In November 2016, under the 2016 Equity Incentive Plan, the Company issued an option effective January 9, 2017 to a director to purchase up to 100,000 shares of common stock at a purchase price of $0.75 per share. The option was valued at $44,789, fair value, using the Black-Scholes Option Pricing Formula. The option expires in 10 years and vests immediately. The option is expensed over the vesting term. For the three and six months ending June 30, 2017, the Company recognized $0 and $44,789 of expense. As of June 30, 2017, the option to purchase 100,000 shares of common stock is still outstanding.

In December 2016, the Company issued a warrant effective January 1, 2017 to a senior advisor to purchase up to 275,000 shares of common stock at a purchase price of $0.60 per share. The warrant was valued at $102,222, fair value, using the Black-Scholes Option Pricing Formula. The warrant expires in 5 years and vests 181,250 immediately

and the remaining in equal monthly installments of 9,375 over the next 10 months. In March 2017, the warrant was amended to vest 181,250 shares of common stock immediately and 92,750 shares of common stock on March 24, 2017. The warrant is expensed over the vesting term. For the three and six months ending June 30, 2017, the Company recognized $0 and $106,576 of expense. As of June 30, 2017, the warrant to purchase 275,000 shares of common stock is still outstanding.

In January 2017, under the 2016 Equity Incentive Plan, the Company issued options to the Company s five independent directors to each purchase 50,000 shares of common stock at a purchase price of $0.85 per share. Each option was valued at $26,547, fair value, using the Black-Scholes Option Pricing Formula. The options expire in 10 years with 20,000 vesting immediately and the remainder vesting in quarterly equal installments of 10,000 commencing April 1, 2017. The options are expensed over the vesting terms. For the three and six months ending June 30, 2017, the Company recognized $26,615 and $105,895 of expense. As of June 30, 2017, the options to purchase 250,000 shares of common stock are still outstanding.

For the three months ending June 30, 2017 the Company issued 2,599 shares, with a fair value of $2,000, to a director serving as a member of the Company s Operations Committee commencing August 2015. For the three months ending June 30, 2017, the Company recognized $2,000 of expense. For the six months ending June 30, 2017 the Company issued 10,997 shares, with a fair value of $8,000. For the six months ending June 30, 2017, the Company recognized $8,000 of expense.

In March 2017, under the 2016 Equity Incentive Plan, the Company issued an option effective April 1, 2017 to an employee to purchase up to 15,000 shares of common stock at a purchase price of $0.73 per share. Using the Black-Scholes Option Pricing Formula, the option was valued at $6,243, fair value. The option expires in 10 years and vests immediately. The option is expensed over the vesting term. For the three and six months ending June 30, 2017, the Company recognized $6,243 of expense. As of June 30, 2017, the option to purchase 15,000 shares of common stock is still outstanding.



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**LIGHTWAVE LOGIC, INC.**

**NOTES TO FINANCIAL STATEMENTS**

**JUNE 30, 2017 AND 2016**

**NOTE 7 STOCKHOLDERS EQUITY (CONTINUED)**

**Common Stock Options and Warrants (Continued)**

In March 2017, under the 2016 Equity Incentive Plan, the Company issued an option effective April 1, 2017 to a new director to purchase up to 200,000 shares of common stock at a purchase price of $0.73 per share. Using the Black-Scholes Option Pricing Formula, the option was valued at $92,516, fair value. The option expires in 10 years and vests 50,000 on April 1, 2017 and the remaining in equal annual installments of 50,000 commencing on April 1, 2018. The option is expensed over the vesting term. For the three and six months ending June 30, 2017, the Company recognized $28,895 of expense. As of June 30, 2017, the option to purchase 200,000 shares of common stock is still outstanding.

In March 2017, under the 2016 Equity Incentive Plan, the Company issued an option effective May 1, 2017 to the new Chief Executive Officer to purchase up to 350,000 shares of common stock at a purchase price of $0.70 per share. Using the Black-Scholes Option Pricing Formula, the option was valued at $280,120, fair value. The option expires in 10 years and vests 87,500 on May 1, 2017 and the remaining in equal quarterly installments of 87,500 commencing on August 1, 2017. The option is expensed over the vesting term. For the three and six months ending June 30, 2017, the Company recognized $116,463 of expense. As of June 30, 2017, the option to purchase 350,000 shares of common stock is still outstanding.

During June 2014 through August 2014, the Company issued 4,207,600 shares of common stock and warrants to purchase 4,207,600 shares of common stock expiring five years from the date of purchase, for proceeds of $3,140,000 in accordance to a private placement memorandum as amended on May 27, 2014. Pursuant to the terms of the offerings, up to 60 units were offered at the purchase price of $50,000 per unit, with each unit comprised of 67,000 shares and a warrant to purchase 33,500 shares of common stock at $1.00 per share and a warrant to purchase 33,500 shares of common stock at $1.25 per share. During May 2017, warrants were partially exercised to purchase 469,000 shares of common stock for proceeds of $502,500.

In May 2017, under the 2016 Equity Incentive Plan, the Company issued an option to an employee to purchase 20,000 shares of common stock at a purchase price of $1.50 per share. The option was valued at $17,353, fair value, using the Black-Scholes Option Pricing Formula. The option expires in 10 years and vests in quarterly equal installments of

5,000 commencing June 1, 2017. The option is expensed over the vesting term. For the three and six months ending June 30, 2017, the Company recognized $5,753 of expense. As of June 30, 2017, the option to purchase 20,000 shares of common stock is still outstanding.

In May 2017, under the 2016 Equity Incentive Plan, the Company issued an option to an employee to purchase 10,000 shares of common stock at a purchase price of $1.50 per share. The option was valued at $8,677, fair value, using the Black-Scholes Option Pricing Formula. The option expires in 10 years and vests in quarterly equal installments of 2,500 commencing June 1, 2017. The option is expensed over the vesting term. For the three and six months ending June 30, 2017, the Company recognized $2,876 of expense. As of June 30, 2017, the option to purchase 10,000 shares of common stock is still outstanding.

In May 2017, under the 2016 Equity Incentive Plan, the Company issued an option to a new employee to purchase 25,000 shares of common stock at a purchase price of $1.50 per share. The option was valued at $23,889, fair value, using the Black-Scholes Option Pricing Formula. The option expires in 10 years and vests in quarterly equal installments of 3,125 commencing August 17, 2017. The option is expensed over the vesting term. For the three and six months ending June 30, 2017, the Company recognized $1,461 of expense. As of June 30, 2017, the option to purchase 25,000 shares of common stock is still outstanding.

In May 2017, under the 2016 Equity Incentive Plan, the Company issued an option to a director to purchase 300,000 shares of common stock at a purchase price of $1.50 per share. The option was valued at $250,000, fair value, using the Black-Scholes Option Pricing Formula. The option expires in 10 years and vests immediately. The option is expensed over the vesting term. For the three and six months ending June 30, 2017, the Company recognized $250,000 of expense. As of June 30, 2017, the option to purchase 300,000 shares of common stock is still outstanding.

**LIGHTWAVE LOGIC, INC.**

**NOTES TO FINANCIAL STATEMENTS**

**JUNE 30, 2017 AND 2016**

## NOTE 7 STOCKHOLDERS EQUITY (CONTINUED)

### Common Stock Options and Warrants (Continued)

In May 2017, under the 2016 Equity Incentive Plan, the Company issued an option to a new employee to purchase 10,000 shares of common stock at a purchase price of $1.50 per share. The option was valued at $9,585, fair value, using the Black-Scholes Option Pricing Formula. The option expires in 10 years and vests in quarterly equal installments of 1,250 commencing September 12, 2017. The option is expensed over the vesting term. For the three and six months ending June 30, 2017, the Company recognized $247 of expense. As of June 30, 2017, the option to purchase 10,000 shares of common stock is still outstanding.

During January 2017, an option to purchase 100,000 shares of common stock at an exercise price of $0.72 expired. During March 2017, a warrant to purchase 10,000 shares of common stock at an exercise price of $1.69 expired. During May 2017, warrants to purchase 100,000 shares of common stock at an exercise price of $1.20 expired. During June 2017, an option to purchase 200,000 shares of common stock at an exercise price of $0.90 expired. During January 2017, an option to purchase 100,000 shares of common stock at an exercise price of $1.69 forfeited.

## NOTE 8 STOCK BASED COMPENSATION

The Company uses the Black-Scholes option pricing model to calculate the grant-date fair value of an award, with the following assumptions for 2017: no dividend yield, expected volatility, based on the Company s historical volatility, 64% to 75%, risk-free interest rate 1.76 to 1.97% and expected option life of 5 to 5.75 years.

As of June 30, 2017, there was $343,128 of unrecognized compensation expense related to non-vested market-based share awards that is expected to be recognized through June 2019.

The following tables summarize all stock option and warrant activity of the Company during the six months ended June 30, 2017:

| | Non-Qualified Stock Options and Warrants Outstanding and Exercisable | | |
|---|---|---|---|
| | **Number of Shares** | **Exercise Price** | **Weighted Average Exercise Price** |
| Outstanding, December 31, 2016 | 18,101,367 | $ 0.57 - $1.69 | $ 0.90 |
| Granted | 1,555,000 | $ 0.60 - $1.50 | $ 0.90 |
| Expired | (772,500) | $ 0.68 - $1.69 | $ 0.98 |
| Forfeited | | | |
| Exercised | (469,000) | $ 1.00 - $1.25 | $ 1.07 |
| Outstanding, June 30, 2017 | 18,414,867 | $ 0.57 - $1.69 | $ 0.89 |
| Exercisable, June 30, 2017 | 17,691,742 | $ 0.57 - $1.69 | $ 0.89 |

**LIGHTWAVE LOGIC, INC.**

**NOTES TO FINANCIAL STATEMENTS**

**JUNE 30, 2017 AND 2016**

**NOTE 8 STOCK BASED COMPENSATION (Continued)**

The aggregate intrinsic value of options and warrants outstanding and exercisable as of June 30, 2017 was $10,372,903. The aggregate intrinsic value is calculated as the difference between the exercise price of the underlying options and warrants and the closing stock price of $1.48 for the Company s common stock on June 30, 2017. No options or warrants were exercised during the three and six months period ending June 30, 2017.

| | Non-Qualified Stock Options and Warrants Outstanding | | |
|---|---|---|---|
| Range of Exercise Prices | Number Outstanding Currently Exercisable at June 30, 2017 | Weighted Average Remaining Contractual Life | Weighted Average Exercise Price of Options and Warrants Currently Exercisable |
| $0.57 - $1.69 | 17,691,742 | 4.59 Years | $0.89 |

**NOTE 9 RELATED PARTY**

At June 30, 2017 the Company had a legal accrual to related party of $47,992 and travel and office expense accruals of officers in the amount of $1,592. At December 31, 2016 the Company had a legal accrual to related party of $2,900 and travel and office expense accruals of officers in the amount of $2,659.

**NOTE 10 RETIREMENT PLAN**

The Company established a 401(k) retirement plan covering all eligible employees beginning November 15, 2013. A contribution of $9,799 and $10,000 was charged to expense and accrued for the six months ending June 30, 2017 and June 30, 2016 to all eligible non-executive participants. A contribution of $4,157 and $5,000 was charged to expense and accrued for the three months ending June 30, 2017 and June 30, 2016 to all eligible non-executive participants.

**NOTE 11 SUBSEQUENT EVENTS**

During July 2017, the Company issued a warrant to purchase 150,000 shares of common stock at a purchase price of $1.48 per share for accounting services to be rendered over a twelve month period commencing July 1, 2017. The warrant was valued at $124,788, fair value, using the Black-Scholes Option Pricing Formula, vesting over the next twelve months with 12,500 vesting immediately, 12,500 vesting per month on the first day of the next ten months and 12,500 vesting on the first day of the twelfth month of the corresponding service agreement. The warrant expires in five years. The expense is being recognized based on service terms of the agreement over a twelve month period.

In August 2017, under the 2016 Equity Incentive Plan, the Company issued an option to an employee to purchase up to 10,000 shares of common stock at a purchase price of $1.05 per share. Using the Black-Scholes Option Pricing Formula, the option was valued at $6,169, fair value. The option expires in 10 years and vests 2,500 on August 15, 2017 and the remaining in equal three month installments of 2,500 commencing on November 15, 2017. The option is expensed over the vesting term.



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**Item 2**

**Management's Discussion and Analysis of Financial Condition and Results of Operations**

## Overview

Lightwave Logic, Inc. (the **Company**) is a development stage company whose P$^2$IC™ technology addresses advanced telecommunication, data communications, and data center markets utilizing its advanced organic electro-optic polymer systems. The Company currently has two business segments to support its development activities, its materials development segment located in Newark, Delaware, and its photonic device design and development segment located in Longmont, Colorado.

**Materials Development**

The Company designs and synthesizes organic chromophores for use in its own proprietary electro-optic *polymer systems* and photonic device designs. A polymer system is not solely a material, but also encompasses various technical enhancements necessary for its implementation. These include host polymers, poling methodologies, and molecular spacer systems that are customized to achieve specific optical properties. Our organic electro-optic polymer systems compounds are mixed into solution form that allows for thin film application. Our proprietary electro-optic polymers are designed at the molecular level for potentially superior performance, stability and cost-efficiency. We believe they have the potential to replace more expensive, lower-performance materials and devices used in fiber-optic ground, wireless and satellite communication networks.

Our patented and patent pending molecular architectures are based on a well-understood chemical and quantum mechanical occurrence known as *aromaticity*. Aromaticity provides a high degree of molecular stability that enables our core molecular structures to maintain stability under a broad range of polymerization conditions that otherwise appear to affect other current polymer molecular designs.

We expect our patented and patent-pending optical materials along with trade secrets and licensed materials, to be the core of and the enabling technology for future generations of optical devices, modules, sub-systems and systems that we will develop or potentially out-license to electro-optic device manufacturers. The Company contemplates future applications that may address the needs of semiconductor companies, aerospace companies and government agencies.

**Prototype Device Design and Development**

*Electro-optic Modulators*

The Company designs its own proprietary electro-optical modulation devices. Electro-optical modulators convert data from electric signals (binary data) into optical signals that can then be transmitted over high-speed fiber-optic cables. These devices are key components that have historically limited the ability of telecommunications, data communications, data centers networks to keep up with the seemingly endless flow of data in the form of voice calls, text messages, pictures, video streaming that are being transmitted to a growing array of devices.

*Polymer Photonic Integrated Circuits ($P^2IC^{TM}$)*

The Company also designs its own proprietary Polymer Photonic Integrated Circuits. A Polymer Photonic Integrated Circuit is a photonic device that integrates several photonic functions on a single chip. We believe that our technology can enable the ultra-miniaturization needed to increase the number of photonic functions residing on a chip to create a progression like what was seen in the computer integrated circuits, commonly referred to as Moore s Law.

Current photonic technology is based on inorganic crystalline materials, which due to physical limitations have not been able to address devices such as slot waveguides that require highly miniaturized geometries. Slot modulators have the potential to scale in integration for increased functionality and would be highly beneficial to data center infrastructure. Organic electro-optic polymers have greater potential because they can be applied as a thin film coating. Our polymers are unique in that they can withstand extremely high semiconductor process temperatures to seamlessly integrate into existing CMOS manufacturing lines. Our devices, enabled by our organic electro-optic polymer material systems, work by affecting the optical properties of light in the presence of an electric field at extremely high frequencies (wide bandwidths) and possess inherent advantages over current crystalline electro-optic material contained in most modulator devices such as lithium niobate, indium phosphide and gallium arsenide.

**Business Strategy**

Our business strategy anticipates that our revenue stream will be derived from one or some combination of the following: (i) technology licensing for specific product application; (ii) joint venture relationships with significant industry leaders; or (iii) the production and direct sale of our own electro-optic device components. Our objective is to be a leading provider of proprietary technology and know-how in the electro-optic device market. In order to meet this objective, we intend to:

- Further the development of proprietary organic electro-optic polymer material systems
- Develop photonic devices based on our P²IC™ technology
- Continue to develop proprietary intellectual property
- Continue to add device development capabilities
- Continue to add to material development capabilities
- Maintain/develop strategic relationships with major telecommunications and data communications companies to further the awareness and commercialization of our technology
- Continue to add high-level science and technology personnel in key areas of our materials and device development programs.

*Create Organic Polymer-Enabled Electro-Optic Modulators*

We intend to utilize our proprietary optical polymer technology to create an initial portfolio of commercially feasible electro-optic polymer product devices and applications for various markets, including telecommunications, data communications and data centers.

We expect our initial product device line will be a high-speed 4 x 25 Gbps ridge waveguide modulator to compete in the growing 100 Gbps modulator market. This will be followed by a 4 x 50Gbps ridge waveguide modulator that will compete in the 400Gbps market.

*Continue to Expand Our Intellectual Property Portfolio and Reliance on Trade Secrets*

We plan to continuously advance the development of unique organic electro-optic polymer materials along with proprietary designs and device configurations. We intend to protect our technology by filing patent applications where appropriate or by obtaining exclusive technology rights where available. However, in some cases, we will refrain from protecting certain proprietary with patents in favor of trade secrets.

*Maintain/Develop Strategic Relationships Private Firms, and Academic Institutions*

Since the formation of our Company, we have had numerous strategic relationships with government agencies that have provided us with funding and access to important technology. From the time that we developed our own in-house testing capability and Class 100 clean room facility in Longmont, Colorado, we will utilize outside foundries as and when needed for specific tasks and processes.

After completion of our initial prototype ridge waveguide, we will seek to enter into partnership/JV discussions with outside parties to co-develop a slot waveguide modulator.

*Continue to recruit industry experts to gain technical expertise*

On April 1, 2017 Dr. Frederick Leonberger, PhD became a member of our Board of Directors and was appointed as a member of its Operations Committee. Dr. Leonberger is the former Chief Technology Officer of JDS Uniphase, Inc. Dr. Leonberger is presently assisting our Company with strategic planning and the design of optical modulators that we intend to develop. Dr. Leonberger has served our Company in various advisory and consulting roles since 2011.



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**Proprietary Products in Development**

As part of a two-pronged marketing strategy, our Company is developing several optical devices, which are in various stages of development and that utilize our organic nonlinear optical materials. They include:

*Ridge Waveguide Modulator*

Our ridge electro-optic waveguide modulator was designed and fabricated in our Longmont, Colorado laboratory. The fabrication of our first in-house device is significant to our entire device program and is an important starting point for modulators that are being developed for target markets. We have multiple generations of new materials that we will soon be optimizing for this specific design. On December 27, 2016, we announced that our initial alpha prototype ridge waveguide modulator, enabled by our $P^2$IC polymer system, demonstrated bandwidth suitable for data rates up to about 10 Gbps, which exceeds the telecom OC-48 standard (2.5 Gbps).

On April 26, 2017, we announced a significant improvement over our initial alpha prototype ridge waveguide modulator by achieving bandwidth suitable for 25Gbps data rates in our all-organic polymer ridge waveguide intensity modulator prototype, and on July 19, 2017 we further advanced its high-speed modulation performance to satisfy 28Gbps data rates for QSFP28 standards and 100Gbps data center applications (using 4 channels of 25 Gbps). This device, enabled by our $P^2$IC polymer system, demonstrated true amplitude (intensity) modulation in a Mach-Zehnder modulator structure incorporating our polymer waveguides. We are optimizing relevant 28Gbps device performance parameters and are now focused on commercializing our ridge waveguide modulator. To that end, we have entered into a contract with a packaging partner that has deep experience in high-speed telecommunications and data communications optoelectronic devices. The partner will package Lightwave s 28Gbps modulators so further evaluations can be made--both internally and externally by potential customers.

Additionally, we are continuing to move towards extending our prototype ridge waveguide modulator to operate up to 50 Gbps. A 50Gbps device would be the key to open the door for our Company to address the next large market, 400Gbps nodes (e.g., using 8 modulators that are multiplexed together (8 x 50Gbps = 400Gbps)) or alternatively 4 modulators at 50Gbps (4 x 50Gbps = 200Gbps) and the use of PAM4 coding to double the modulated speed to 400Gbps (200Gbps x 2 = 400Gbps).

The ridge waveguide modulator represents our first commercially viable device, and targets metro networks (< 10Km) within large scale telecommunications and data communications networks and represents approximately a $300MM per year market opportunity for us.

*Slot Waveguide Modulator*

Our functional polymer photonics slot waveguide modulator utilizes an existing modulator structure with one of our proprietary electro-optic polymer material systems as the enabling material layer, and is functional as an operating prototype device.

Preliminary testing and initial data on our polymer photonics slot waveguide modulators demonstrated several promising characteristics. The tested polymer photonic chip had a 1-millimeter square footprint, enabling the possibility of sophisticated integrated optical circuits on a single silicon substrate. In addition, the waveguide structure was approximately 1/20 the length of a typical inorganic-based silicon photonics modulator waveguide.

With the combination of our proprietary electro-optic polymer material and the extremely high optical field concentration in the slot waveguide modulator, the test modulators demonstrated less than 2.2 volts to operate. Initial speeds exceeded 30-35 GHz in the telecom, 1550 nanometer frequency band. This is equivalent to four, 10Gbps, inorganic, lithium niobate modulators that would require approximately 12-16 volts to move the same amount of information.

Our material also operates in the 1550 nanometer frequency band, which is suitable for data communications applications. We continued with our collaborative development of our SOH/ Polymer photonic slot waveguide modulator in 2014 and continued our collaboration with an associated third-party research group through 2016.



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*Our Long-Term Device Development Goal - Multichannel Integrated Nanophotonic Transceiver*

While we consider our ridge waveguide and slot waveguide modulators currently under development to be commercially viable products, in another sense they are intermediate steps in the development of our long-term goal of a multichannel integrated nanophotonic transceiver for application in data communications.

The transceiver consists of a silicon photonic chip fabricated with nonlinear polymer infused modulators (polymer photonic), multiplexers, demultiplexers, detectors and grating fiber couplers to an external light source. The CMOS-compatible optical modulators are key components for future silicon-based photonic transceivers. Our solution, the silicon-organic hybrid (polymer photonic) platform has been proposed and is being prototyped. In the polymer photonic approach, the optical signal is guided by a silicon waveguide while an organic cladding provides the electro-optic effect.

**Target Markets**

*Cloud computing and data centers*

*Big data* is a general term used to describe the voluminous amount of unstructured and semi-structured data a Company creates -- data that would take too much time and cost too much money to load into a relational database for analysis. Companies are looking to cloud computing in their data centers to access all the data. Inherent speed and bandwidth limits of traditional solutions and the potential of organic polymer devices offer an opportunity to increase the bandwidth, reduce costs and improve speed of access.

While the number of data centers is declining, the overall square footage has been growing rapidly. Data centers are confronted with the problem of moving vast amounts of data not only around the data center itself, but also between data centers. The size of these data center links are often measured in kilometers and employ optical modulators to convert stored electrical/binary information to optical and back. Links that are shorter than 500 meters can employ direct modulation, which accomplishes modulation by mechanically turning a laser on and off. However, for links greater than 500 meters, it is necessary to employ optical modulators. We intend to target optical devices that are aimed at the 500m to 10km distance segment of the market. These are single mode fiber links and require polymer optical devices that operate in single optical mode. While some data center customers are planning their architectures using single mode fiber links even below 500m, others are focusing on cost-performance to make their decisions for their particular architectures. Our technology is both single mode and scalable, which means that it can be implemented in either data center application depending on how we achieve the customer metrics and specifications. We believe that our single mode modulator solutions will not only be competitive at 500m to 10km link distances, but

also at distances below 500m depending on the customer architecture designs.

*Telecommunications/Data Communications*

The telecommunications industry has evolved from transporting traditional analogue voice data over copper wire into the movement of digital voice and data. Telecommunication companies are faced with the enormous increasing challenges to keep up with the resulting tremendous explosion in demand for bandwidth. This has been further exacerbated by a recent trend for content providers to store large amounts of data closer to the end user. This results in enormous demands on telecommunication metro networks (less than 10 Kilometers in length) and their ability to facilitate the transportation of content.

We believe that our ridge waveguide modulator, when completed will have the potential to address several segments within telecommunications networks.

**Recent Significant Events and Milestones Achieved**

In December 2016, we achieved high-speed modulation in our first all-organic polymer ridge waveguide intensity modulator prototype, which constituted one of the most significant moments in the history of our Company. Our initial "alpha" prototype device, enabled by our P2IC polymer system, demonstrated bandwidth suitable for data rates up to about 10 Gbps. This performance exceeds the telecom OC-48 standard (2.5 Gbps). This device demonstrated true amplitude (intensity) modulation in a Mach-Zehnder modulator structure incorporating our polymer waveguides. Thereafter, we began to move towards extending our initial "alpha" prototype device to operate up to 25 Gbps, which is important to the optical networking industry because this data rate is a major node to achieve 100 Gbps (using 4 channels of 25 Gbps).



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In April 2017, we successfully achieved bandwidth suitable for 25Gbps data rates in our all-organic polymer ridge waveguide intensity modulator prototype, and on July 19, 2017 we further advanced its high-speed modulation performance to satisfy 28Gbps data rates for QSFP28 standards and 100Gbps data center applications (using 4 channels of 25 Gbps), enabling our Company to address the explosive 100Gbps market for optical modulators using our $P^2IC$ Technology Platform. We are optimizing relevant 28Gbps device performance parameters and are now focused on commercializing our ridge waveguide modulator. To that end, we have entered into a contract with a packaging partner that has deep experience in high-speed telecommunications and data communications optoelectronic devices. The partner will package Lightwave s 28Gbps modulators so further evaluations can be made--both internally and externally by potential customers.

Additionally, we are continuing to move towards extending our prototype ridge waveguide modulator to operate up to 50 Gbps. A 50Gbps device would be the key to open the door for our Company to address the next large market, 400Gbps nodes (e.g., using 8 modulators or 4 modulators with PAM4 coding).

As we move forward through 2017, we expect to (i) bring in-house more specific skill sets in materials engineering and in device testing and fabrication, as well as personnel to orchestrate our various Company activities; and (ii) attract an industry partner with the synergistic capabilities necessary to help develop future products that are in various stages of design, such as a slot waveguide modulator and our integrated fiber optic polymer-based transceiver over and above device packaging competences.

**Capital Requirements**

As a development stage company, we do not generate revenues. We have incurred substantial net losses since inception. We have satisfied our capital requirements since inception primarily through the issuance and sale of our common stock.

**Results of Operations**

**Comparison of three months ended June 30, 2017 to three months ended June 30, 2016**

Revenues

As a development stage company, we had no revenues during the three months ended June 30, 2017 and June 30, 2016. The Company is in various stages of photonic device and material development and evaluation. We expect the next revenue stream to be in product development agreements, prototype devices and sale of nonlinear optical polymer materials prior to moving into production.

Operating Expenses

Our operating expenses were $1,637,463 and $1,039,330 for the three months ended June 30, 2017 and 2016, respectively, for an increase of $598,133. The increase in operating expenses was due primarily to increases in non-cash stock option and warrant amortization, legal fees, product prototype development and material testing expenses, research and development salaries, patent amortization and patent related expenses, product development consulting expenses, recruiting fees, laboratory materials and supplies, shareholder annual meeting expenses and license fees offset by decreases in general and administrative salaries and research and development travel.

Included in our operating expenses for the three months ended June 30, 2017 was $839,014 for research and development expenses compared to $592,570 for the three months ended June 30, 2016, for an increase of $246,444. The increase in research and development expenses is primarily due to increases in product prototype development and material testing expenses, research and development salaries, patent amortization and patent related expenses, non-cash research and development stock option and warrant amortization, product development consulting expenses, laboratory materials and supplies and license fees offset by a decrease in research and development travel.

Research and development expenses currently consist primarily of compensation for employees and consultants engaged in internal research, product development activities; laboratory operations, internal material and device fabrication testing and prototype electro-optic device design, development and prototype device processing; costs; and related operating expenses.

We expect to continue to incur substantial research and development expense to develop and commercialize our photonic devices and electro-optic materials platform. These expenses will increase as a result of accelerated development effort to support commercialization of our non-linear optical polymer materials technology; to build photonic device prototypes in our in-house laboratories; hiring additional technical and support personnel; engaging a senior technical advisor; pursuing other potential business opportunities and collaborations; customer testing and evaluation; and incurring related operating expenses.

Product prototype development and material testing expenses increased $58,808 from $22,972 for the three months ended June 30, 2016 to $81,780 for the three months ended June 30, 2017.

Wages and salaries increased $49,783 to $310,775 for the three months ended June 30, 2017 from $260,992 for the three months ended June 30, 2016.

Patent amortization and patent related expenses increased $46,626 from $3,973 for the three months ended June 30, 2016 to $50,599 for the three months ended June 30, 2017.

Research and development non-cash stock option and warrant amortization increased $45,551 to $159,179 for the three months ending June 30, 2017 from $113,628 for the three months ended June 30, 2016.

Product development consulting expenses increased $26,195 from $62,272 for the three months ended June 30, 2016 to $88,467 for the three months ended June 30, 2017.

Laboratory materials and supplies increased $12,413 from $29,098 for the three months ended June 30, 2016 to $41,511 for the three months ended June 30, 2017.

License fees increased $7,500 from $0 for the three months ended June 30, 2016 to $7,500 for the three months ended June 30, 2017 for the license fee.

Travel expenses decreased $5,616 from $15,437 for the three months ended June 30, 2016 to $9,821 for the three months ended June 30, 2017.

General and administrative expense consists primarily of compensation and support costs for management staff, and for other general and administrative costs, including executive, sales and marketing, investor relations, accounting and finance, legal, consulting and other operating expenses.

General and administrative expenses increased $351,689 to $798,449 for the three months ended June 30, 2017 compared to $446,760 for the three months ended June 30, 2016. The increase is primarily due to increases in non-cash general and administrative stock option and warrant amortization, legal fees, recruiting fees and shareholder annual meeting expenses offset by a decrease in salaries.

General and administrative non-cash stock option and warrant amortization increased $275,334 to $317,248 for the three months ending June 30, 2017 from $41,914 for the three months ended June 30, 2016.

Legal fees increased $68,925 to $160,526 for the three months ending June 30, 2017 from $91,601 for the three months ended June 30, 2016.

Recruiting fees increased $20,000 to $20,000 for the three months ending June 30, 2017 from $0 for the three months ended June 30, 2016.

Shareholder annual meeting expenses increased $12,170 to $51,088 for the three months ending June 30, 2017 from $38,918 for the three months ended June 30, 2016.

General and administrative salaries decreased by $16,567 from $156,560 for the three months ended June 30, 2016 to $139,993 for the three months ended June 30, 2017.

We expect general and administrative expense to increase in future periods as we increase the level of corporate and administrative activity, including increases associated with our operation as a public company; and significantly increase expenditures related to the future production and sales of our products.

Other Income (Expense)

Other expense increased $29,168 to $29,106 for the three months ended June 30, 2017 from ($62) for the three months ended June 30, 2016, relating to the commitment fee associated with the purchase of shares by an institutional investor for sale under a stock purchase agreement.

Net Loss

Net loss was $1,666,569 and $1,039,268 for the three months ended June 30, 2017 and 2016, respectively, for an increase of $627,301, due primarily to increases in non-cash stock option and warrant amortization, legal fees, product prototype development and material testing expenses, research and development salaries, patent amortization and patent related expenses, commitment fee associated with the purchase of shares by an institutional investor for sale under a stock purchase agreement, product development consulting expenses, recruiting fees, laboratory materials and supplies, shareholder annual meeting expenses and license fees offset by decreases in general and administrative salaries and research and development travel.

**Comparison of six months ended June 30, 2017 to six months ended June 30, 2016**

Revenues

As a development stage company, we had no revenues during the six months ended June 30, 2017 and June 30, 2016. The Company is in various stages of photonic device and material development and evaluation. We expect the next revenue stream to be in product development agreements, prototype devices and sale of nonlinear optical polymer materials prior to moving into production.

Operating Expenses

Our operating expenses were $2,826,390 and $2,098,641 for the six months ended June 30, 2017 and 2016, respectively, for an increase of $727,749. The increase in operating expenses was due primarily to increases in non-cash stock option and warrant amortization, product development consulting expenses, product prototype development and material testing expenses, legal fees, patent amortization and patent related expenses, research and

development salaries, recruiting fees, license fees, shareholder annual meeting expenses and accounting fees offset by decreases in investor relations and general and administrative salaries.

Included in our operating expenses for the six months ended June 30, 2017 was $1,567,528 for research and development expenses compared to $1,195,833 for the six months ended June 30, 2016, for an increase of $371,695. The increase in research and development expenses is primarily due to increases in product development consulting expenses, non-cash stock option and warrant amortization, product prototype development and material testing expenses, patent amortization and patent related expenses, research and development salaries and license fees.

Research and development expenses currently consist primarily of compensation for employees and consultants engaged in internal research, product development activities; laboratory operations, internal material and device fabrication testing and prototype electro-optic device design, development and prototype device processing; costs; and related operating expenses.

We expect to continue to incur substantial research and development expense to develop and commercialize our photonic devices and electro-optic materials platform. These expenses will increase as a result of accelerated development effort to support commercialization of our non-linear optical polymer materials technology; to build photonic device prototypes in our in-house laboratories; hiring additional technical and support personnel; engaging a senior technical advisor; pursuing other potential business opportunities and collaborations; customer testing and evaluation; and incurring related operating expenses.

Product development consulting expenses increased $75,363 from $117,625 for the six months ended June 30, 2016 to $192,988 for the six months ended June 30, 2017.

Research and development non-cash stock option and warrant amortization increased $110,405 from $201,164 for the six months ended June 30, 2016 to $311,569 for the six months ended June 30, 2017.



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Product prototype development and material testing expense increased $62,953 from $47,690 for the six months ended June 30, 2016 to $110,643 for the six months ended June 30, 2017.

Patent amortization and patent related expenses increased $46,626 from $7,946 for the six months ended June 30, 2016 to $54,572 for the six months ended June 30, 2017.

Wages and salaries increased $51,140 from $544,784 for the six months ended June 30, 2016 to $595,924 for the six months ended June 30, 2017.

License fees increased $15,000 from $0 for the six months ended June 30, 2016 to $15,000 for the six months ended June 30, 2017 for the license fee.

General and administrative expense consists primarily of compensation and support costs for management staff, and for other general and administrative costs, including executive, sales and marketing, investor relations, accounting and finance, legal, consulting and other operating expenses.

General and administrative expenses increased $356,054 to $1,258,862 for the six months ended June 30, 2017 compared to $902,808 for the six months ended June 30, 2016. The increase is primarily due to increases in non-cash stock option and warrant amortization, legal fees, recruiting fees, shareholder annual meeting expenses and accounting fees offset by a decrease in investor relations and salaries.

Non-cash stock option and warrant amortization increased $290,699 to $400,848 for the six months ending June 30, 2017 from $110,149 for the six months ended June 30, 2016.

Legal fees increased $62,442 to $208,854 for the six months ended June 30, 2017 compared to $146,412 for the six months ended June 30, 2016.

Recruiting fees increased $20,000 to $20,000 for the six months ended June 30, 2017 compared to $0 for the six months ended June 30, 2016.

Shareholder annual meeting expenses increased $12,170 to $51,088 for the six months ended June 30, 2017 from $38,918 for the six months ended June 30, 2016.

Accounting fees increased $9,084 to $54,084 for the six months ended June 30, 2017 compared to $45,000 for the six months ended June 30, 2016.

Investor relations expenses decreased by $20,102 from $28,549 for the six months ended June 30, 2016 to $8,447 for the six months ended June 30, 2017.

Salaries and wages decreased $16,820 to $306,836 for the six months ended June 30, 2017 from $323,656 for the six months ended June 30, 2016.

We expect general and administrative expense to increase in future periods as we increase the level of corporate and administrative activity, including increases associated with our operation as a public company; and significantly increase expenditures related to the future production and sales of our products.

Other Income (Expense)

Other expense decreased $184,039 to $53,797 for the six months ended June 30, 2017 from $237,836 for the six months ended June 30, 2016, relating to the commitment fee associated with the purchase of shares by an institutional investor for sale under a stock purchase agreement.



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Net Loss

Net loss was $2,880,187 and $2,336,477 for the six months ended June 30, 2017 and 2016, respectively, for an increase of $543,710, due primarily to increases in non-cash stock option and warrant amortization, product development consulting expenses, product prototype development and material testing expenses, legal fees, patent amortization and patent related expenses, research and development salaries, recruiting fees, license fees, shareholder annual meeting expenses and accounting fees offset by decreases in commitment fee associated with the purchase of shares by an institutional investor for sale under a stock purchase agreement, investor relations and general and administrative salaries.

**Significant Accounting Policies**

Our discussion and analysis of our financial condition and results of operations are based on our financial statements, which have been prepared in accordance with accounting principles generally accepted in the United States. The preparation of these financial statements requires us to make estimates and judgments that affect the reported amounts of assets, liabilities, revenues and expenses, and related disclosure of contingent assets and liabilities. On an ongoing basis, we evaluate our estimates based upon historical experience and various other assumptions that we believe to be reasonable under the circumstances, the results of which form the basis for making judgments about the carrying values of assets and liabilities that are not readily apparent from other sources. Our actual results may differ materially from these estimates.

We believe our significant accounting policies affect our more significant estimates and judgments used in the preparation of our financial statements. Our Annual Report on Form 10-K for the year ended December 31, 2016 contains a discussion of these significant accounting policies. There have been no significant changes in our significant accounting policies since December 31, 2016. See our Note 1 in our unaudited financial statements for the six months ended June 30, 2017 as set forth herein for a complete discussion of our Company s accounting policies.

**Liquidity and Capital Resources**

During the six months ended June 30, 2017, net cash used in operating activities was $1,891,833 and net cash used in investing activities was $77,899, which was due primarily to the Company s research and development activities and general and administrative expenditures. Net cash provided by financing activities for the six months ended June 30, 2017 was $2,153,314. At June 30, 2017, our cash and cash equivalents totaled $2,140,426, our assets totaled $3,500,624, our liabilities totaled $387,691, and we had stockholders equity of $3,112,933.

During the six months ended June 30, 2016, net cash used in operating activities was $1,606,832 and net cash used in investing activities was $19,970, which was due primarily to the Company s research and development activities and general and administrative expenditures. Net cash provided by financing activities for the six months ended June 30, 2016 was $0. At June 30, 2016, our cash and cash equivalents totaled $2,103,903, our assets totaled $3,346,768, our liabilities totaled $114,899, and we had stockholders equity of $3,231,869.

**Sources and Uses of Cash**

Our future expenditures and capital requirements will depend on numerous factors, including: the progress of our research and development efforts; the rate at which we can, directly or through arrangements with original equipment manufacturers, introduce and sell products incorporating our polymer materials technology; the costs of filing, prosecuting, defending and enforcing any patent claims and other intellectual property rights; market acceptance of our products and competing technological developments; and our ability to establish cooperative development, joint venture and licensing arrangements. We expect that we will incur approximately $4,800,000 of expenditures over the next 12 months. Our cash requirements are expected to increase at a rate consistent with the Company s path to revenue growth as we expand our activities and operations with the objective of commercializing our electro-optic polymer technology during 2017.

Our business does not presently generate the cash needed to finance our current and anticipated operations. We believe we have raised sufficient capital to finance our operations through February 2018; however, we will need to obtain additional future financing after that time to finance our operations until such time that we can conduct profitable revenue-generating activities. Such future sources of financing may include cash from equity offerings, exercise of stock options, warrants and proceeds from debt instruments; but we cannot assure you that such equity or borrowings will be available or, if available, will be at rates or prices acceptable to us.



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On January 29, 2016, we signed a purchase agreement (the Purchase Agreement ) with Lincoln Park Capital Fund, LLC ( Lincoln Park ) to sell up to $20,000,000 of common stock whereby subject to certain conditions and at our sole discretion, Lincoln Park has committed to purchase up to $20,000,000 of our common stock over a 36-month period. In April 2016, our registration statement became effective, which registered for resale by Lincoln Park under the Purchase Agreement 5,000,000 shares of our common stock. Pursuant to the Purchase Agreement, Lincoln Park is obligated to make purchases as the Company directs in accordance with the Purchase Agreement, which may be terminated by the Company at any time, without cost or penalty. Sales of shares will be made in specified amounts and at prices that are based upon the market prices of our common stock immediately preceding the sales to Lincoln Park. We expect this financing to provide us with sufficient funds to maintain our operations for the foreseeable future. With the additional capital, we expect to achieve a level of revenues attractive enough to fulfill our development activities and adequate enough to support our business model for the foreseeable future. We cannot assure you that we will meet the conditions of the Purchase Agreement with Lincoln Park in order to obligate Lincoln Park to purchase our shares of common stock. In the event we fail to do so, and other adequate funds are not available to satisfy long-term capital requirements, or if planned revenues are not generated, we may be required to substantially limit our operations. This limitation of operations may include reductions in capital expenditures and reductions in staff and discretionary costs.

There are no trading volume requirements or restrictions under the Purchase Agreement and we will control the timing and amount of any sales of our common stock to Lincoln Park. Lincoln Park has no right to require any sales by us, but is obligated to make purchases from us as we direct in accordance with the Purchase Agreement. We can also accelerate the amount of common stock to be purchased under certain circumstances. There are no limitations on use of proceeds, financial or business covenants, restrictions on future funding, rights of first refusal, participation rights, penalties or liquidated damages in the Purchase Agreement. Lincoln Park may not assign or transfer its rights and obligations under the purchase agreement.

We expect that our cash used in operations will increase during 2017 and beyond as a result of the following planned activities:

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The addition of management, sales, marketing, technical and other staff to our workforce;

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Increased spending for the expansion of our research and development efforts, including purchases of additional laboratory and production equipment;

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Increased spending in marketing as our products are introduced into the marketplace;

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Developing and maintaining collaborative relationships with strategic partners;

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Developing and improving our manufacturing processes and quality controls; and

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Increases in our general and administrative activities related to our operations as a reporting public company and related corporate compliance requirements.

**Analysis of Cash Flows**

For the six months ended June 30, 2017

Net cash used in operating activities was $1,891,833 for the six months ended June 30, 2017, primarily attributable to the net loss of $2,880,187 adjusted by $146,814 in warrants issued for services, $565,603 in options issued for services, $61,921 in common stock issued for services, $152,813 in depreciation expenses and patent amortization and noncash expenses, ($97,515) in prepaid expenses and $158,718 in accounts payable and accrued expenses. Net cash used in operating activities consisted of payments for research and development, legal, professional and consulting expenses, rent and other expenditures necessary to develop our business infrastructure.

Net cash used by investing activities was $77,899 for the six months ended June 30, 2017, consisting of $22,070 in cost for intangibles and $55,829 in asset additions primarily for the Colorado lab facility.

Net cash provided by financing activities was $2,153,314 for the six months ended June 30, 2017 and consisted of $1,656,760 in proceeds from resale of common stock to an institutional investor and $502,500 from the exercise of warrants offset by $5,946 repayment of equipment purchased.



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For the six months ended June 30, 2016

Net cash used in operating activities was $1,606,832 for the six months ended June 30, 2016, primarily attributable to the net loss of $2,336,477 adjusted by $46,738 in warrants issued for services, $264,575 in options issued for services, $249,965 in common stock issued for services, $97,573 in depreciation expenses and patent amortization expenses, $59,496 in prepaid expenses, $11,942 in accounts payable and accrued expenses and $644 gain on disposal of property and equipment. Net cash used in operating activities consisted of payments for research and development, legal, professional and consulting expenses, rent and other expenditures necessary to develop our business infrastructure.

Net cash used by investing activities was $19,970 for the six months ended June 30, 2016, consisting of $15,565 in cost for intangibles, $23,905 in asset additions primarily for the new lab facility and $19,500 in proceeds from sale of equipment.

Net cash provided by financing activities was $0 for the six months ended June 30, 2016.

**Inflation and Seasonality**

We do not believe that our operations are significantly impacted by inflation. Our business is not seasonal in nature.

**Item 4**

**Controls and Procedures**

*Evaluation of Disclosure Controls and Procedures.* The Company s management, with the participation of the Company s Principal Executive Officer and Principal Financial Officer, evaluated the effectiveness of the Company s disclosure controls and procedures (as defined in Rules 13a-15(e) and 15d-15(e) under the Securities Exchange Act of 1934, as amended) as of June 30, 2017. Based on this evaluation, the Company s Principal Executive Officer and Principal Financial Officer concluded that, as of June 30, 2017 the Company s disclosure controls and procedures were effective, in that they provide reasonable assurance that information required to be disclosed by the Company in the reports that it files or submits under the Securities Exchange Act of 1934, as amended, is recorded, processed, summarized and reported within the time periods specified in the Securities and Exchange Commission s rules and

forms, and is accumulated and communicated to the Company s management, including the Company s Principal Executive Officer and Principal Financial Officer, as appropriate to allow timely decisions regarding required disclosure.

*Changes in Internal Control Over Financial Reporting.* There were no changes in our internal control over financial reporting during the quarter ended June 30, 2017 that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.



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## PART II OTHER INFORMATION

**Item 2**

**Unregistered Sales of Equity Securities and Use of Proceeds**

| **Date** | **Security/Value** |
|---|---|
| Apr. June 2017 | Common Stock 2,599 shares of common stock at average price of $0.77 per share issued for services. |

No underwriters were utilized and no commissions or fees were paid with respect to any of the above transactions. We relied on Section 4(a)(2) and/or Regulation D of the Securities Act of 1933, as amended, since the transactions did not involve any public offering.

**Item 6**

**Exhibits**

The following exhibits are included herein:

| **Exhibit No.** | **Description of Exhibit** | **Location** |
|---|---|---|
| 10.1 | Director Agreement Frederick J. Leonberger | Incorporated by reference to the Company s Current Report on Form 8-K as filed with the SEC on April 3, 2017 |
| 10.2 | Statement of Operations Committee Work - Frederick J. Leonberger | Incorporated by reference to the Company s Current Report on Form 8-K as filed with the SEC on April 3, 2017 |
| 31.1 | Certification pursuant to Rule 13a-14(a) of the Securities Exchange Act of 1934, as amended, executed by the Principal Executive Officer of the Company. | Filed herewith |
| 31.2 | Certification pursuant to Rule 13a-14(a) of the Securities Exchange Act of 1934, as amended, executed by the Principal Financial Officer of the | Filed herewith |

| | | |
|---|---|---|
| | Company. | |
| 32.1 | Certification pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, executed by the Principal Executive Officer of the Company. | Filed herewith |
| 32.2 | Certification pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, executed by the Principal Financial Officer of the Company. | Filed herewith |
| 101 | XBRL | Filed herewith |

## SIGNATURES

Pursuant to the requirements of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned thereunto duly authorized.

**LIGHTWAVE LOGIC, INC.**

Registrant

By: /s/ Michael S. Lebby
Michael S. Lebby,
Chief Executive Officer
(Principal Executive Officer)

Date: August 14, 2017

By: /s/ James S. Marcelli
James S. Marcelli,
President, Chief Operating Officer
(Principal Financial Officer)

Date: August 14, 2017

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