

IsoRay, Inc.
Form 424B5
March 24, 2014

Filed pursuant to

Rule 424(b)(5)

Registration Nos. 333-188579 and 333-194733

PROSPECTUS SUPPLEMENT

(To Prospectus dated May 28, 2013)

IsoRay, Inc.

5,644,300 Shares of Common Stock

This is an offering on a reasonable best efforts basis of 5,644,300 shares of our common stock pursuant to this prospectus supplement and the accompanying prospectus. The common stock is being offered at a per share purchase price of \$2.60. For a more detailed description of our common stock, see the section entitled "Description of Capital Stock" beginning on page 4 of the accompanying prospectus.

Our common stock is traded on the NYSE MKT under the symbol "ISR." On March 20, 2014, the closing price of our common stock on the NYSE MKT was \$3.30 per share.

The aggregate market value of our outstanding common stock held by non-affiliates was approximately \$158,418,889 based on 48,348,315 shares of outstanding common stock as of March 20, 2014, of which 48,005,724 shares were held by non-affiliates, and a per share price of \$3.30 based on the closing price of our common stock as quoted on the NYSE MKT on March 20, 2014.

Investing in our securities involves a high degree of risk. Before buying any securities, you should read the discussion of material risks of investing in our securities referred to under the heading "Risk Factors" beginning on page S-5 of this prospectus supplement.

	Per share	Total
Public offering price	\$2.60	\$14,675,180
Placement agent fees ⁽¹⁾	\$0.13	\$733,759
Proceeds, before expenses, to us	\$2.47	\$13,941,421

(1) See "Plan of Distribution."

We expect the total offering expenses, excluding the placement agent fees, to be approximately \$120,000 for all sales pursuant to this prospectus supplement and accompanying prospectus.

The placement agent is arranging for the sale of shares of the common stock offered in this prospectus supplement on a "reasonable best efforts" basis. The placement agent is not required to sell any specific number or dollar amount of the securities offered by this prospectus supplement, but will use its best efforts to sell all such securities up to the maximum of \$14,675,180. Funds received will be held in escrow pending closing, and the offering will terminate on the earlier of the date on which all securities offered are sold, or April 5, 2014.

Delivery of the securities will be made to the purchasers on or about March 26, 2014, subject to customary closing conditions. The shares of common stock will be delivered in book-entry form through The Depository Trust Company, New York, New York.

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

Maxim Group LLC

The date of this prospectus supplement is March 24, 2014.

TABLE OF CONTENTS

Prospectus Supplement

ABOUT THIS PROSPECTUS SUPPLEMENT	i
SPECIAL NOTE REGARDING FORWARD-LOOKING STATEMENTS	ii
INDUSTRY AND MARKET DATA	iii
trademarks	iii
Prospectus Supplement Summary	S-1
Risk Factors	S-5
Use of Proceeds	S-6
DETERMINATION OF OFFERING PRICE	S-7
DILUTION	S-7
DESCRIPTION OF THE SECURITIES WE ARE OFFERING	S-8
PLAN OF DISTRIBUTION	S-8
EXPENSES OF ISSUANCE AND DISTRIBUTION	S-9
LEGAL MATTERS	S-9
EXPERTS	S-10
Where You Can Find More Information	S-10
Incorporation of Certain Documents by Reference	S-10

Prospectus

ABOUT THIS PROSPECTUS	1
ABOUT ISORAY	1
RISK FACTORS	3
NOTE REGARDING FORWARD-LOOKING STATEMENTS	3
USE OF PROCEEDS	4
RATIO OF EARNINGS TO FIXED CHARGES	4
GENERAL DESCRIPTION OF SECURITIES	4
DESCRIPTION OF CAPITAL STOCK	4
DESCRIPTION OF PREFERRED STOCK	8
DESCRIPTION OF THE WARRANTS	10
DESCRIPTION OF DEBT SECURITIES	11
DESCRIPTION OF UNITS	21
PLAN OF DISTRIBUTION	22
LEGAL MATTERS	24
EXPERTS	24
INTERESTS OF NAMED EXPERTS AND COUNSEL	24
MATERIAL CHANGES	24
WHERE YOU CAN FIND MORE INFORMATION	24
INCORPORATION BY REFERENCE	25
COMMISSION POSITION ON INDEMNIFICATION FOR SECURITIES ACT LIABILITIES	26

ABOUT THIS PROSPECTUS SUPPLEMENT

Edgar Filing: IsoRay, Inc. - Form 424B5

A registration statement on Form S-3 (File No. 333-188579) utilizing a shelf registration process relating to the securities described in this prospectus supplement has been filed with the Securities and Exchange Commission, or the SEC, and was declared effective on June 14, 2013. Under this shelf registration process, of which this offering is a part, we may, from time to time, sell up to \$20,000,000 of common stock and other securities. We filed a registration statement on Form S-3MEF (File No. 333-194733) on March 21, 2014 to increase the amount of securities that may be sold under the shelf registration statement by \$2,445,876.33.

This document is in two parts. The first part is this prospectus supplement, which describes the specific terms of this offering of our common stock and also adds, updates and changes information contained in the accompanying prospectus and the documents incorporated by reference. The second part is the accompanying base prospectus, which gives more general information, some of which may not apply to this offering of our common stock. To the extent the information contained in this prospectus supplement differs or varies from the information contained in the accompanying prospectus or any document filed prior to the date of this prospectus supplement and incorporated by reference, the information in this prospectus supplement will control. Generally, when we refer to this "prospectus," we are referring to both documents combined, together with any free writing prospectus that we have authorized for use in connection with this offering.

You should rely only on the information contained in or incorporated by reference into this prospectus supplement and the accompanying prospectus. We have not, and the placement agent has not, authorized anyone to provide you with information that is different. This prospectus supplement is not an offer to sell or solicitation of an offer to buy these securities in any circumstances under which the offer or solicitation is unlawful. You should not assume that the information we have included in this prospectus supplement or the accompanying prospectus is accurate as of any date other than the date of this prospectus supplement or the accompanying prospectus, respectively, or that any information we have incorporated by reference is accurate as of any date other than the date of the document incorporated by reference, regardless of the time of delivery of this prospectus supplement or of any of our securities. It is important for you to read and consider all information contained in this prospectus supplement and the accompanying prospectus, including the documents incorporated by reference herein and therein, in making your investment decision. You should also read and consider the information in the documents we have referred you to in "Incorporation of Certain Documents by Reference" and "Where You Can Find More Information" in this prospectus supplement.

SPECIAL NOTE REGARDING FORWARD-LOOKING STATEMENTS

All statements contained in this prospectus supplement, the accompanying prospectus and the documents incorporated by reference herein and therein, other than statements of historical facts, that address future activities, events or developments are forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended, which we refer to as the Securities Act, and Section 21E of the Securities Exchange Act of 1934, as amended, which we refer to as the Exchange Act. These statements often contain the words "may," "will," "believe," "expect," "anticipate," "intends," "estimate," "forecast," "project," and similar expressions, although not all forward-looking statements contain these words. All statements other than statements of historical fact are statements that could be deemed forward-looking statements, including statements relating but not limited to:

- projections of earnings, revenues or other financial items;
- plans and objectives of management for future operations;

- proposed new products or services;
- future operations, plans, regulatory filings or approvals;
- proposed new products or services, any statements regarding pending or future mergers or acquisitions; and
- future economic conditions or performance, and any statement of assumptions underlying any of the foregoing.

These statements are based on certain assumptions and analyses made by us in light of our experience and our assessment of historical trends, current conditions and expected future developments as well as other factors we believe are appropriate under the circumstances. However, whether actual results will conform to the expectations and predictions of management is subject to a number of risks and uncertainties that may cause actual results to differ materially.

You should not place undue reliance on our forward-looking statements because the matters they describe are subject to known and unknown risks, uncertainties and other unpredictable factors, many of which are beyond our control. Our forward-looking statements are based on the information currently available to us and speak only as of the date of this prospectus supplement, the date on the cover of the accompanying prospectus, or, in the case of forward-looking statements incorporated by reference, as of the date of the filing that includes the statement. New risks and uncertainties arise from time to time, and it is impossible for us to predict these matters or how they may affect us. Over time, our actual results, performance or achievements will likely differ from the anticipated results, performance or achievements that are expressed or implied by our forward-looking statements, and such difference might be significant and materially adverse to our security holders. We do not undertake and specifically decline any obligation to update any forward-looking statements or to publicly announce the results of any revisions to any statements to reflect new information or future events or developments.

We have identified some of the important factors that could cause future events to differ from our current expectations and they are described in this prospectus supplement and the accompanying prospectus under the caption "Risk Factors" as well as in our most recent Annual Report on Form 10-K, including without limitation under the captions "Risk Factors" and "Management's Discussion and Analysis of Financial Condition and Results of Operations" and in other documents that we may file with the SEC, all of which you should review carefully. Please consider our forward-looking statements in light of those risks as you read this prospectus supplement and the accompanying prospectus.

INDUSTRY AND MARKET DATA

This prospectus supplement and the accompanying prospectus contain and incorporate by reference market data, industry statistics and other data that have been obtained from, or compiled from, information made available by third parties. Although we believe these third-party sources are reliable, we have not independently verified the information. Except as may otherwise be noted, none of the sources cited in this prospectus supplement or the accompanying prospectus has consented to the inclusion of any data from its reports, nor have we sought their consent. In addition, some data are based on our good faith estimates. Such estimates are derived from publicly available information released by independent industry analysts and third-party sources, as well as our own management's experience in the industry, and are based on assumptions made by us based on such data and our knowledge of such industry and markets, which we believe to be reasonable. However, none of our estimates have been verified by any independent source. See "Special Note Regarding Forward-Looking Statements" above.

TRADEMARKS

Proxcelan, the IsoRay logo and IsoRay are our registered trademarks. These trademarks are important to our business. Although we may have omitted the "®" or "TM" trademark designation for such trademarks in this prospectus supplement, all rights to such trademarks are nevertheless reserved. Unless otherwise noted, other trademarks used in

this prospectus supplement are the property of their respective holders.

iii

Prospectus Supplement Summary

This summary highlights selected information appearing elsewhere or incorporated by reference in this prospectus supplement and accompanying prospectus and may not contain all of the information that is important to you. This prospectus supplement and the accompanying prospectus include or incorporate by reference information about the securities we are offering as well as information regarding our business and detailed financial data. After you read this summary, you should read this prospectus supplement and the accompanying prospectus in their entirety, including the information incorporated by reference in this prospectus supplement and the accompanying prospectus, especially the section entitled "Risk Factors." If you invest in our securities, you are assuming a high degree of risk.

Unless the context requires otherwise, in this prospectus, the terms "IsoRay," the "Company," "we," "us," "our" and similar terms refer to IsoRay, Inc. and its operating subsidiary IsoRay Medical, Inc., and, to the extent applicable, its non-operating subsidiary, IsoRay International LLC.

BUSINESS OVERVIEW

In 2003, IsoRay obtained clearance from the FDA for treatment for all solid tumor applications using Cesium-131. Such applications include prostate cancer; ocular melanoma; head, neck and lung tumors; breast cancer; liver cancer; brain cancer; colorectal cancer; gynecological cancer; esophageal cancer; and pancreatic cancer. The brachytherapy seed form of Cesium-131 may be used in surface, interstitial and intracavity applications for tumors with known radio sensitivity. Management believes its Cs-131 technology will allow it to become a leader in the brachytherapy market. Management believes that the IsoRay Proxcelan Cesium-131 brachytherapy seed represents the first major advancement in brachytherapy technology in over 21 years with attributes that could make it the long-term "seed of choice" for internal radiation therapy procedures.

Brachytherapy seeds are small devices used in an interstitial radiation procedure. The procedure has become one of the primary treatments for prostate cancer. The brachytherapy procedure places radioactive seeds as close as possible to (in or near) the cancerous tumor (the word "brachytherapy" means close therapy). The seeds deliver therapeutic radiation thereby killing the cancerous tumor cells while minimizing exposure to adjacent healthy tissue. This procedure allows doctors to administer a higher dose of radiation directly to the tumor. Each seed contains a radioisotope sealed within a welded titanium capsule. When brachytherapy is the only treatment (monotherapy) used in the prostate, approximately 70 to 120 seeds are permanently implanted in the prostate in an outpatient procedure lasting less than one hour. The number of seeds used varies based on the size of the prostate and the activity level specified by the physician. When brachytherapy is combined with external beam radiation or intensity modulated radiation therapy (dual therapy), then approximately 40 to 80 seeds are used in the procedure. The isotope decays over time and eventually the seeds become inert. The seeds may be used as a primary treatment or in conjunction with other treatment modalities, such as chemotherapy, or as treatment for residual disease after excision of primary tumors. The number of seeds for other treatment sites will vary from as few as 8 to 16 to as many as 117 to 123

depending on the type of cancer, the location of the tumor being treated and the type of therapy being utilized.

IsoRay began production and sales of Proxcelan® Cesium-131 brachytherapy seeds in October 2004 for the treatment of prostate cancer after clearance of its premarket notification (510(k)) by the Food and Drug Administration (FDA). In December 2007, IsoRay began selling its Proxcelan Cs-131 seeds for the treatment of ocular melanoma, however, the market for the treatment has been limited generating a minimal amount of revenue for the Company. The Company continues to make the treatment available to interested physicians and medical facilities. In June 2009, the Company began selling its Proxcelan Cs-131 seeds for treatment of head and neck tumors, commencing with treatment of a tumor that could not be accessed by other treatment modalities. The Company obtained clearance in August 2009 from the FDA to permit loading Cesium-131 into bioabsorbable braided strands, facilitating treatment of lung, head and neck tumors as well as tumors in other organs with Proxcelan Cs-131. During the fiscal year ended June 30, 2010, the Company expanded the number of areas of the body in which the Proxcelan Cs-131 seeds were being utilized for treatment by adding lung cancer in August 2009, colorectal cancer in October 2009, and chest wall cancer in December 2009. During the fiscal year ended June 30, 2011, the Company continued the expansion in the number of areas of the body in which the Proxcelan Cs-131 seeds were being utilized through the addition of the treatment of brain cancer in September 2010 and the treatment of gynecological cancer in December 2010.

S-1

In March 2011, the Company received clearance to commercially deliver Proxcelan Cesium-131 brachytherapy seeds that are preloaded into bioabsorbable braided strands into Europe. This clearance permits the product to be commercially distributed for treatment of lung, head and neck tumors as well as tumors in other organs in Europe.

In August 2011, IsoRay Medical received clearance from the FDA for its premarket notification (510(k)) for the GliaSite® radiation therapy system. The GliaSite® Radiation Therapy System is the only FDA-cleared balloon catheter device used in the treatment of brain cancer.

In May 2012, IsoRay Medical received a CE mark for the GliaSite® Radiation Therapy System which states that the Company conforms with the product requirements of the European Council Directive 93/42/EEC. The CE mark allows the GliaSite® Radiation Therapy System to be sold in 31 European countries and to be marketed in the European Free Trade Associate member states and the European Union. In June 2012, the first Cesium-131 brachytherapy seed sutured mesh was implanted on a patient suffering from a recurring meningioma tumor.

Management focused in fiscal 2012 and 2013 on obtaining its regulatory clearances and final research and development of its GliaSite® Radiation Therapy System, entering into international distribution agreements to sell the product in Europe and Australia, and marketing its brain and lung products. The GliaSite® Radiation Therapy System is the world's only system that enables doctors to use liquid radiation in areas where the cancer is most likely to remain after brain surgery and tumor removal. In fiscal 2013, the Company began using a system developed at the Barrow Neurologic Institute to deliver doses of Cesium-131 to treat malignant meningioma, brain metastases, and primary cancers of the brain. A multi-institutional study was conducted to explore use by Cesium-131 laden strands placed directly into the cavity following surgical resection of brain metastases.

While management has not identified new opportunities to expand treatment to other sites in the body, it continues to investigate opportunities with interested physicians and medical facilities. Management is now focusing primarily on the brain and lung markets while the Company is researching delivery systems other than those historically used by the Company.

In August 2013, IsoRay Medical received an approval for an extension to the scope of the CE mark for the GliaSite Radiation Therapy System. This approval allows IsoRay Medical to implement certain product improvements that management believes will enhance GliaSite's acceptance by customers in the European market.

In December 2013, IsoRay Medical received clearance from the FDA for its premarket notification (510(k)) for Cesitrex™, its liquid Cesium-131 isotope, for use with the GliaSite Radiation Therapy System.

OUR CORPORATE INFORMATION

Our principal executive offices are located at 350 Hills Street, Suite 106, Richland, Washington 99354, and our telephone number is (509) 375-1202. We maintain an Internet website at www.isoray.com. Information on or accessible through our website does not constitute part of this prospectus supplement and should not be relied upon in connection with making any investment decision with respect to the securities offered by this prospectus supplement.

Although our predecessor operating company was organized in 1998, IsoRay, Inc. was incorporated in 1983 in Minnesota and operated under the name Century Park Pictures Corporation until the merger with IsoRay Medical, Inc. on July 28, 2005.

S-2

THE OFFERING

The following is a brief summary of some of the terms of the offering and is qualified in its entirety by reference to the more detailed information appearing elsewhere in this prospectus supplement and the accompanying prospectus. For a more complete description of the terms of our common stock, see the "Description of the Securities We Are Offering" section in this prospectus supplement.

Securities We Are Offering 5,644,300 shares of our common stock, par value \$0.001 per share, having an aggregate gross offering price of \$14,675,180.

Common Stock Outstanding Before This Offering 48,348,315 shares as of March 20, 2014.

Common Stock To Be Outstanding After This Offering 53,992,615 shares, assuming no other shares of common stock are issued.

Use of Proceeds We estimate that the net proceeds to us from this offering after expenses and commissions will be approximately \$13,821,421. We intend to use the net proceeds from the sale of our shares of common stock offered by this prospectus supplement for general corporate purposes, including without limitation, working capital needs. See "Use of Proceeds."

Risk Factors Our business is subject to substantial risk. Please carefully consider the "Risk Factors" beginning on page S-5 of this prospectus supplement, page 3 of the accompanying prospectus and other information included and incorporated by reference in this prospectus supplement and the accompanying prospectus including, but not limited to, the "Risk Factors" in our Annual Report on Form 10-K for the fiscal year ended June 30, 2013 (together with any material changes thereto contained in subsequent filed Quarterly Reports on Form 10-Q), for a discussion of the factors you should consider carefully before deciding to purchase these securities. Additional risks and uncertainties not presently known to us or that we currently deem immaterial may also impair our business operations. You should be able to bear a complete loss of your investment.

Dividends We have not paid any cash dividends on our common stock and currently intend to retain any earnings to fund our working capital needs and growth opportunities.

NYSE MKT Symbol ISR

Edgar Filing: IsoRay, Inc. - Form 424B5

The number of shares of our common stock outstanding before this offering is based on approximately 48,348,315 shares outstanding as of March 20, 2014 and excludes:

798,438 shares of common stock issuable upon the exercise of warrants outstanding at March 20, 2014 at a weighted average exercise price of \$1.10 per share;

59,065 shares of common stock issuable upon the conversion of Series B preferred stock outstanding at March 20, 2014;

S-3

2,370,072 shares of common stock issuable upon the exercise of options outstanding at March 20, 2014 at a weighted average exercise price of \$1.79 per share; and

3,262,612 shares of common stock reserved for future stock option grants as of March 20, 2014 under our equity compensation plans.

S-4

Risk Factors

Investing in our securities involves a high degree of risk. You should carefully consider the risks listed below and other information included and incorporated by reference in this prospectus supplement and accompanying prospectus. There may also be risks of which we are currently unaware, or that we currently regard as immaterial based on the information available to us that later prove to be material. If any of these risks occur, our business, operating results and financial condition could be seriously harmed, the trading price of our common stock could decline, and you could lose some or all of your investment.

Risks Related to this Offering

The Price Of Our Common Stock May Be Adversely Affected By The Future Issuance And Sale Of Shares Of Our Common Stock Or Other Equity Securities. We cannot predict the size of future issuances or sales of our common stock or other equity securities, future acquisitions or capital raising activities, or the effect, if any, that such issuances or sales may have on the market price of our common stock. The issuance and sale of substantial amounts of common stock or other equity securities or announcement that such issuances and sales may occur, could adversely affect the market price of our common stock.

Future Sales By Shareholders, Or The Perception That Such Sales May Occur, May Depress The Price Of Our Common Stock. The sale or availability for sale of substantial amounts of our shares in the public market, including shares issuable upon conversion of outstanding Series B preferred stock or exercise of common stock warrants and options, or the perception that such sales could occur, could adversely affect the market price of our common stock and also could impair our ability to raise capital through future offerings of our shares. As of March 20, 2014, we had 48,348,315 outstanding shares of common stock, and the following additional shares were reserved for issuance: 2,370,072 shares upon exercise of outstanding options, 798,438 shares upon exercise of outstanding warrants, and 59,065 shares upon conversion of Series B preferred stock. Any decline in the price of our common stock may encourage short sales, which could place further downward pressure on the price of our common stock and may impair our ability to raise additional capital through the sale of equity securities.

The Issuance Of Shares Upon Exercise Of Derivative Securities May Cause Immediate And Substantial Dilution To Our Existing Shareholders. The issuance of shares upon conversion of the Series B preferred stock and the exercise of common stock warrants and options may result in substantial dilution to the interests of other shareholders since these selling shareholders may ultimately convert or exercise and sell all or a portion of the full amount issuable upon exercise. If all derivative securities outstanding as of March 20, 2014 were converted or exercised into shares of common stock, there would be approximately an additional 3,227,575 shares of common stock outstanding as a result. The issuance of these shares will have the effect of further diluting the proportionate equity interest and voting power of holders of our common stock.

Since We Have Broad Discretion In How We Use The Proceeds From This Offering, We May Use The Proceeds In Ways In Which You Disagree. Our management will have significant flexibility in applying the net proceeds of this offering. You will be relying on the judgment of our management with regard to the use of these net proceeds, and you will not have the opportunity, as part of your investment decision, to assess whether the proceeds are being used appropriately. It is possible that the net proceeds will be invested in a way that does not yield a favorable, or any, return for our company. The failure of our management to use such funds effectively could have a material adverse effect on our business, financial condition, operating results and cash flow.

Purchasers Of The Shares Will Incur Immediate Dilution. Purchasers of shares of common stock in this offering will experience immediate and substantial dilution because the purchase price of the common stock will be higher than the net tangible book value per share of the outstanding common stock immediately after this offering. In addition, purchasers will experience dilution, which may be substantial, when we issue additional shares of common stock that we are permitted or required to issue under options, warrants, our stock option plans or other employee or director compensation plans. In this offering, after deducting the placement agent fees and estimated offering expenses payable by us, you will experience immediate dilution of \$2.121 per share, representing the difference between our as adjusted net tangible book value per share as of December 31, 2013 after giving effect to this offering. See the section entitled "Dilution" below for a more detailed discussion of the dilution you will incur if you purchase common stock in this offering.

Risks Related to our Business

We Have Entered Into An Agreement With A Single Supplier For Our Cesium-131 From Russia. In January 2013, the Company entered into a new agreement with JSC Isotope to purchase Cesium-131 directly from JSC Isotope instead of directly from Institute of Nuclear Materials (INM) and Research Institute of Atomic Reactors (RIAR) as the Company had done prior to the original agreement with UralDial LLC in December 2008. As a result, the Company now relies on JSC Isotope to obtain Cesium-131 from its single Russian source. Through the JSC Isotope agreement and a subsequent addendum we have obtained set pricing for our Russian Cesium-131 through the end of August 2014. There can be no guarantee that JSC Isotope will always be able to supply us with sufficient Cesium-131 or will renew our existing contract on favorable terms in August 2014, which could be due in part to risks associated with foreign operations and beyond either our or JSC Isotope's control. The recent instability in Russia increases the risks associated with our Russian supplier. If we were unable to obtain supplies of isotopes from Russia in the future, our overall supply of Cesium-131 could be reduced significantly unless we have a source of enriched barium for utilization in domestic reactors beyond the quantity that we already own. While recent testing of regions within the reactor at MURR has found that Cesium-131 can be produced in economically viable quantities at a viable price, there is no assurance that we can obtain the increased quantity of isotope at the pricing and quantities that the Company requires in the long term. However the due diligence that has been conducted by the Company and the University of Missouri at the Missouri University Research Reactor has demonstrated that the Company would be able to continue producing enough Cesium-131 utilizing its existing three target locations and naturally occurring barium that has been enriched using the inventory of enriched barium that the Company currently owns. Management estimates that the supply of enriched barium that it currently owns should last from 24 to 36 months which would allow time to expand into other irradiation sites within MURR or at another reactor to supplement its supply of Cs-131.

Use of Proceeds

Assuming we sell 5,644,300 shares of our common stock in this offering, we estimate that the net proceeds from the sale of the shares of common stock that we are offering hereby will be approximately \$13,821,421, based on the public offering price of \$2.60 per share, after deducting the placement agent fees and the estimated offering expenses payable by us.

We intend to use the net proceeds from the sale of our shares of common stock offered by this prospectus supplement for general corporate purposes, including without limitation working capital needs.

Although we have identified some of the potential uses of the proceeds from this offering, we have and reserve broad discretion in the application of these proceeds. Accordingly, we reserve the right to use these proceeds for different purposes or uses which we have not listed above, particularly if there is a change in demand for certain applications of our Cesium-131 and other products which may require increased investment in protocols and research studies and the hiring of additional sales staff. See "Risk Factors – *Since We Have Broad Discretion In How We Use The Proceeds*

From This Offering, We May Use The Proceeds In Ways In Which You Disagree."

Based on our current plans, we believe that our net proceeds from this offering, together with our existing cash, cash equivalents and restricted cash will be sufficient to fund our anticipated operating expenses and capital expenditures for at least the next several fiscal years.

Pending any ultimate use of any portion of the proceeds from this offering, we intend to invest the proceeds in short – and medium – term interest-bearing obligations, investment-grade instruments, certificates of deposit or direct or guaranteed obligations of the U.S. government.

S-6

In addition, while we have not entered into any agreements, commitments or understandings relating to any significant transaction as of the date of this prospectus supplement, we may use a portion of the proceeds to pursue acquisitions, joint ventures and other strategic transactions.

Determination of Offering Price

We will sell our common stock in this offering at a negotiated price of \$2.60 per share of common stock. The principal factors considered in determining the terms and conditions of the sale of our shares hereunder include:

- the market price of our common stock;
- the recent market prices of, and demand for, publicly traded common stock of generally comparable companies; and
- other factors deemed relevant by the placement agent and us.

Dilution

Our net tangible book value on December 31, 2013 was approximately \$ 6,226,116 or approximately \$0.162 per share. "Net tangible book value" is total assets minus the sum of liabilities and intangible assets. "Net tangible book value per share" is net tangible book value divided by the total number of shares of common stock outstanding at December 31, 2013.

Net tangible book value dilution per share to new investors represents the difference between the amount per share paid by purchasers of shares of common stock in this offering and the net tangible book value per share of our common stock immediately after completion of this offering. Assuming we sell shares of our common stock in this offering at the public offering price of \$2.60 per share and after deducting the placement agent fees and estimated offering expenses payable by us, our as adjusted net tangible book value as of December 31, 2013 would have been \$ 0.479 per share. This amount represents an immediate increase in net tangible book value of \$ 0.317 per share to existing shareholders and an immediate dilution of \$ 2.121 per share to purchasers of common stock in this offering at the assumed public offering price, as illustrated in the following table:

Public offering price per share, net of offering costs	\$2.4487
Net tangible book value per share as of December 31, 2013	\$0.1620

Edgar Filing: IsoRay, Inc. - Form 424B5

Increase in net tangible book value per share attributable to this offering	\$2.2867
Pro forma net tangible book value per share as of December 31, 2013 after giving effect to this offering	\$0.4790
Dilution per share to new investors in this offering	\$2.1210

The table above excludes, as of December 31, 2013, the following securities:

7,605,771 shares of common stock issuable upon the exercise of warrants with a weighted average exercise price of \$0.89;

- 3,121,480 shares of common stock issuable on the conversion of Series D preferred stock;

- 59,065 shares of common stock issuable upon the conversion of Series B preferred stock;

2,370,072 shares of common stock issuable upon the exercise of options with a weighted average exercise price of \$1.79; and

- 1,262,612 shares of common stock reserved for future stock option grants under our equity compensation plans.

S-7

To the extent that any of these options, warrants and convertible securities are exercised or converted, there may be further dilution to new investors.

Description of THE SECURITIES WE ARE OFFERING

In this offering, we are offering 5,644,300 shares of our common stock sold at \$2.60 per share.

Description of the Common Stock

A description of the common stock we are offering pursuant to this prospectus supplement is set forth under the heading "Description of Capital Stock," starting on page 4 of the accompanying prospectus. As of March 20, 2014, we had 48,348,315 shares of common stock outstanding.

PLAN OF DISTRIBUTION

We are offering the shares of our common stock through our placement agent, Maxim Group LLC. Subject to the terms and conditions contained in the letter agreement, dated March 21, 2014, Maxim Group LLC has agreed to act as the placement agent for the offering on a reasonable best efforts basis. The placement agent is not purchasing or selling any shares by this prospectus supplement or the accompanying prospectus.

The letter agreement provides that the obligations of the placement agent and the investors are subject to certain conditions precedent, including approval of the listing of the shares by NYSE MKT.

We will sell the offered common stock to selected accredited investors under one or more securities purchase agreements entered into between us and each of the investors at the offering price stated on the cover of this prospectus supplement. We currently anticipate that the closing of the sale of the common stock offered hereby will take place on or about March 26, 2014. Investors will also be informed of the date and manner in which they must transmit the purchase price for their common stock. Funds received will be placed into an escrow account, and released to us upon the closing. The offering will terminate on the earlier of the date on which all securities offered are sold or April 5, 2014.

On the scheduled closing date, the following will occur:

- we will receive funds in the amount of the aggregate purchase price for the common stock we sell;
- we will deliver to each of the investors, through the DWAC system or by book-entry, the shares being purchased; and
- Maxim Group LLC will receive a placement agent fee in accordance with the terms of the letter agreement.

In accordance with the terms of the letter agreement, we will pay the placement agent an aggregate commission equal to 5% of the gross proceeds of the sale of the common stock in the offering. The estimated offering expenses payable by us, in addition to the placement agent fee of \$733,759, are \$120,000 which includes the company legal, accounting and printing costs and various other fees associated with registering and listing the common stock.

The placement agent has informed us that it will not engage in over-allotment, stabilizing transactions or syndicate covering transactions in connection with the offering.

S-8

The placement agent may, from time to time, engage in transactions with and perform services for us in the ordinary course of its business.

We have agreed not to (i) issue, enter into any agreement to issue, or announce the issuance of any common stock or securities convertible into or exercisable for common stock or (ii) enter into certain variable rate transactions, in each case for a period of 75 days from the date of the letter agreement.

We have agreed to indemnify the placement agent against certain liabilities, including liabilities under the Securities Act of 1933, as amended, and liabilities arising from breaches of representations and warranties contained in the letter agreement. We have also agreed to contribute to payments the placement agent may be required to make in respect of such liabilities.

The foregoing does not purport to be a complete statement of the terms and conditions of the letter agreement. Closing of the purchase and sale of the shares is subject to customary closing conditions. The form securities purchase agreement with purchasers and the letter agreement will be included as exhibits to a Current Report on Form 8-K that we will file with the SEC in connection with this offering and incorporated by reference into the registration statement of which this prospectus supplement and the accompanying prospectus form a part. See "Where You Can Find More Information" below.

The transfer agent for our common shares to be issued in this offering is Computershare Trust Company. Our common shares are traded on the NYSE MKT equities exchange under the symbol "ISR".

EXPENSES OF ISSUANCE AND DISTRIBUTION

The following is a statement of the estimated expenses, other than any placement agent fees, to be incurred in connection with the distribution of securities under this prospectus supplement.

SEC registration fee	1,785	(1)
NYSE MKT listing fees	45,000	
Legal fees and expenses	60,000	
Accountants' fees and expenses	10,000	
Miscellaneous	3,215	
Total	120,000	

(1) SEC registration fees were paid by us upon filing the registration statement of which this prospectus supplement forms a part.

LEGAL MATTERS

The validity of the issuance of the securities offered by this prospectus supplement and the accompanying prospectus will be passed upon for us by Keller Rohrback, LLP, Phoenix, Arizona. Certain partners of Keller Rohrback, LLP hold common stock of the Company, which in the aggregate equal less than one-quarter of a percent (0.25%) of the total issued and outstanding shares of our common stock. Ellenoff Grossman & Schole LLP, New York, New York, is acting as counsel for the placement agent in connection with this offering.

S-9

EXPERTS

The financial statements incorporated by reference in this prospectus supplement have been so incorporated by reference in reliance upon the report of DeCoria, Maichel & Teague, P.S., independent registered public accountants, upon the authority of said firm as experts in accounting and auditing in giving said reports.

Where You Can Find More Information

This prospectus supplement and accompanying prospectus constitute a part of a registration statement on Form S-3 that we filed with the SEC under the Securities Act of 1933, as amended. We refer you to this registration statement for further information about us and our common stock offered hereby.

We file annual, quarterly and special reports and other information with the SEC (Commission File Number 001-33407). These filings contain important information that does not appear in this prospectus supplement or the accompanying prospectus. For further information about us, you may read and copy any reports, statements and other information filed by us at the SEC's Public Reference Room at 100 F Street, N.E., Room 1580, Washington, D.C. 20549-0102. You may obtain further information on the operation of the Public Reference Room by calling the SEC at 1-800-SEC-0330. Our SEC filings are also available on the SEC Internet site at <http://www.sec.gov>, which contains periodic reports and other information regarding issuers that file electronically.

Incorporation of Certain Documents by Reference

The SEC allows us to "incorporate by reference" into this prospectus the information we file with it. This means that we can disclose important information to you by referring you to those documents. The information we incorporate by reference is considered to be a part of this prospectus supplement, and later information we file with the SEC will automatically update and supersede this information. The following documents filed with the SEC (in each case, under our Commission File No. 001-33407) are incorporated by reference in this prospectus supplement:

- Annual Report on Form 10-K for the fiscal year ended June 30, 2013, filed on September 30, 2013;

• Quarterly Reports on Form 10-Q for the fiscal quarters ended September 30, 2013, and December 31, 2013, filed on November 14, 2013 and February 14, 2014;

Edgar Filing: IsoRay, Inc. - Form 424B5

- Current Reports on Form 8-K filed on August 29, 2013, August 30, 2013, November 15, 2013, January 7, 2014, January 17, 2014, January 23, 2014, February 18, 2014, March 6, 2014 and March 12, 2014;

• Proxy Statement on Schedule 14A filed on December 24, 2013 in preliminary form and on January 21, 2014 in definitive form and additional materials filed on January 22, 2014;

the description of our common stock contained in our Registration Statement on Form 8-A filed with the SEC on April 12, 2007 (File No. 001-333407), including any amendments or reports filed for the purpose of updating such description;

• the description of our rights contained in our Registration Statement on Form 8-A filed on February 7, 2007 (File No. 001-14247), including any amendments or reports filed for the purpose of updating such description; and

all documents subsequently filed by us pursuant to Sections 13(a), 13(c), 14 and 15(d) of the Securities Exchange Act of 1934, as amended (the "Exchange Act"), (i) after the date on which this registration statement that includes this prospectus supplement was initially filed with the SEC and prior to the effectiveness of such registration statement, and (ii) after the date of this prospectus supplement and prior to the termination of this offering, unless otherwise stated therein.

S-10

Notwithstanding the foregoing, information furnished under Items 2.02 and 7.01 of any Current Report on Form 8-K, including the related exhibits, is not incorporated by reference in this prospectus supplement.

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

We will provide without charge to each person to whom this prospectus supplement is delivered, upon oral or written request, a copy of any or all of the foregoing documents incorporated herein by reference (other than exhibits to such documents unless such exhibits are specifically incorporated by reference into the information that this prospectus supplement incorporates). Written or telephone requests should be directed to: IsoRay, Inc., 350 Hills Street, Suite 106, Richland, Washington 99354, telephone number (509) 375-1202, Attn: Corporate Secretary.

You should rely only on the information contained or incorporated by reference in this prospectus supplement. We have not authorized anyone else to provide you with different or additional information. We will not make an offer of these securities in any state where the offer is not permitted. You should not assume that the information in this prospectus supplement is accurate as of any date other than the date of this document.

ISORAY, INC.

\$20,000,000

Common Stock

Preferred Stock

Warrants

Debt Securities

Units

We may offer to the public from time to time in one or more series or issuances at prices and on terms that we will determine at the time of each offering, shares of our common stock, shares of preferred stock, warrants to purchase shares of our common stock, preferred stock and/or debt securities, debt securities consisting of debentures, notes or other evidences of indebtedness, units consisting of a combination of the foregoing securities, or any combination of these securities. The aggregate initial offering price of all securities sold by us pursuant to this prospectus will not exceed \$20,000,000.

This prospectus describes the general manner in which our securities may be offered using this prospectus. Each time we offer and sell securities, we will provide you with a prospectus supplement that will contain specific information about the terms of that offering. Any prospectus supplement may also add, update, or change information contained in this prospectus. You should carefully read this prospectus and the applicable prospectus supplement as well as the documents incorporated or deemed to be incorporated by reference in this prospectus before you purchase any of the securities offered hereby. This prospectus may not be used to offer and sell securities unless accompanied by a prospectus supplement.

We may offer the securities directly or through agents or to or through underwriters or dealers. If any agents or underwriters are involved in the sale of the securities their names, and any applicable purchase price, fee, commission or discount arrangement between or among them, will be set forth, or will be calculable from the information set forth, in an accompanying prospectus supplement. The securities may be offered and sold through public or private transactions at market prices prevailing at the time of sale, at a fixed price or fixed prices, at negotiated prices, at various prices determined at the time of sale or at prices related to prevailing market prices. We can sell the securities through agents, underwriters or dealers only with delivery of a prospectus supplement describing the method and

terms of the offering of such securities. In addition, shares of our common stock may be offered from time to time through ordinary brokerage transactions on the NYSE MKT. See "Plan of Distribution."

Our principal executive offices are located at 350 Hills Street, Suite 106, Richland, Washington 99354, and our telephone number is (509) 375-1202.

Our common stock is listed on the NYSE MKT under the symbol "ISR" and as of May 20, 2013, the closing price of our common stock was \$0.5281. The aggregate market value of our outstanding Common Stock held by non-affiliates was approximately \$19,015,932, based on 34,611,517 shares of outstanding Common Stock as of May 9, 2013, of which 33,957,023 shares were held by non-affiliates, and a per share price of \$0.56 based on the closing price of our Common Stock as quoted on the NYSE MKT on April 22, 2013. As of the date hereof, we have sold \$3,500,000 of securities pursuant to General Instruction I.B.6. of Form S-3 during the prior twelve calendar month period that ends on, and includes, the date of this prospectus. Each prospectus supplement will contain information, where applicable, as to any listing on the NYSE MKT or any other securities exchange of the securities covered by the prospectus supplement.

Investing in the securities we may offer involves various risks. See the sections entitled "Risk Factors" on page 3 and "Note Regarding Forward-Looking Statements" on page 3. Additional risks associated with an investment in us as well as with the particular types of securities will be described in the related prospectus supplement and certain of our filings with the Securities and Exchange Commission.

Neither the Securities and Exchange Commission nor any state securities commission has approved or disapproved of these securities or determined if this prospectus is truthful or complete. Any representation to the contrary is a criminal offense.

The date of this prospectus is May 28, 2013.

TABLE OF CONTENTS

	<u>Page</u>
ABOUT THIS PROSPECTUS	1
ABOUT ISORAY	1
RISK FACTORS	3
NOTE REGARDING FORWARD-LOOKING STATEMENTS	3
USE OF PROCEEDS	4
RATIO OF EARNINGS TO FIXED CHARGES	4
GENERAL DESCRIPTION OF SECURITIES	4
DESCRIPTION OF CAPITAL STOCK	4
DESCRIPTION OF PREFERRED STOCK	7
DESCRIPTION OF THE WARRANTS	10
DESCRIPTION OF DEBT SECURITIES	11
DESCRIPTION OF UNITS	21
PLAN OF DISTRIBUTION	22
LEGAL MATTERS	24
EXPERTS	24
INTERESTS OF NAMED EXPERTS AND COUNSEL	24
MATERIAL CHANGES	24
WHERE YOU CAN FIND MORE INFORMATION	24
INCORPORATION BY REFERENCE	24
COMMISSION POSITION ON INDEMNIFICATION FOR SECURITIES ACT LIABILITIES	26

The registration statement, including the exhibits and the documents incorporated herein by reference, can be read on the Securities and Exchange Commission website are at the Securities and Exchange Commission offices mentioned under the heading "Where You Can Find More Information."

Until _____, all dealers that effect transactions in these securities, whether or not participating in this offering, may be required to deliver a prospectus. This is in addition to the dealers' obligation to deliver a prospectus when acting as underwriters and with respect to their unsold allotments or subscriptions.

ABOUT THIS PROSPECTUS

You should rely only on the information contained or incorporated by reference in this prospectus. We have not authorized anyone to provide you with different information. If anyone provides you with different or inconsistent information, you should not rely on it. This prospectus is not an offer to sell these securities and it is not soliciting an offer to buy these securities in any jurisdiction where the offer or sale is not permitted. You should not assume that the information in this prospectus is accurate as of any date other than the date on the front cover of this prospectus. You should not assume that the information incorporated by reference in this prospectus is accurate as of any date other than the date the respective information was filed with the Securities and Exchange Commission. Our business, financial condition, results of operations and prospects may have changed since those dates.

This prospectus is part of a registration statement that we filed with the Securities and Exchange Commission, or SEC, using a “shelf” registration process. Under this shelf registration process, we may sell any of the securities, or any combination of the securities, described in this prospectus, in each case in one of more offerings up to a total dollar amount of proceeds of \$20,000,000. This prospectus describes the general manner in which our securities may be offered by this prospectus. Each time we sell securities, we will provide a prospectus supplement that will contain specific information about the terms of those securities and terms of that offering. The prospectus supplement may also add, update or change information contained in this prospectus or in documents incorporated by reference in this prospectus. To the extent that any statement that we make in a prospectus supplement is inconsistent with statements made in this prospectus or in documents incorporated by reference in this prospectus, you should rely on the information in the prospectus supplement. You should carefully read both this prospectus and any prospectus supplement together with the additional information described under “Where You Can Find More Information” before buying any securities in this offering.

Until such time, if ever, as we are eligible to use General Instruction I.B.1. of Form S-3, pursuant to General Instruction I.B.6. of Form S-3, we are permitted to use the registration statement of which this prospectus forms a part to sell, via a primary offering, a maximum amount of securities equal to one-third of the aggregate market value of our outstanding voting and non-voting common equity held by non-affiliates of our company in any twelve month period.

ABOUT ISORAY

In this prospectus, the terms "IsoRay," the "Company," "we," "us," "our" and similar terms refer to IsoRay, Inc. and its operating subsidiary IsoRay, Medical, Inc., and, to the extent applicable, its non-operating subsidiary, IsoRay International LLC.

In 2003, IsoRay obtained clearance from the FDA for treatment for all solid tumor applications using Cesium-131. Such applications include prostate cancer; ocular melanoma; head, neck and lung tumors; breast cancer; liver cancer; brain cancer; colorectal cancer; gynecological cancer; esophageal cancer; and pancreatic cancer. The brachytherapy seed form of Cesium-131 may be used in surface, interstitial and intracavity applications for tumors with known radio sensitivity. Management believes its Cs-131 technology will allow it to become a leader in the brachytherapy market. Management believes that the IsoRay Proxcelan Cesium-131 brachytherapy seed represents the first major advancement in brachytherapy technology in over 21 years with attributes that could make it the long-term "seed of choice" for internal radiation therapy procedures.

Brachytherapy seeds are small devices used in an interstitial radiation procedure. The procedure has become one of the primary treatments for prostate cancer. The brachytherapy procedure places radioactive seeds as close as possible to (in or near) the cancerous tumor (the word "brachytherapy" means close therapy). The seeds deliver therapeutic radiation thereby killing the cancerous tumor cells while minimizing exposure to adjacent healthy tissue. This procedure allows doctors to administer a higher dose of radiation directly to the tumor. Each seed contains a radioisotope sealed within a welded titanium capsule. When brachytherapy is the only treatment (monotherapy) used in the prostate, approximately 70 to 120 seeds are permanently implanted in the prostate in an outpatient procedure lasting less than one hour. The number of seeds used varies based on the size of the prostate and the activity level specified by the physician. When brachytherapy is combined with external beam radiation or intensity modulated radiation therapy (dual therapy), then approximately 40 to 80 seeds are used in the procedure. The isotope decays over time and eventually the seeds become inert. The seeds may be used as a primary treatment or in conjunction with other treatment modalities, such as chemotherapy, or as treatment for residual disease after excision of primary tumors. The number of seeds for other treatment sites will vary from as few as 8 to 16 to as many as 117 to 123 depending on the type of cancer, the location of the tumor being treated and the type of therapy being utilized.

IsoRay began production and sales of Proxcelan Cesium-131 brachytherapy seeds in October 2004 for the treatment of prostate cancer after clearance of its premarket notification (510(k)) by the Food and Drug Administration (FDA). In December 2007, IsoRay began selling its Proxcelan Cs-131 seeds for the treatment of ocular melanoma, however, the market for the treatment has been limited generating a minimal amount of revenue for the Company. The Company continues to make the treatment available to interested physicians and medical facilities. In June 2009, the Company began selling its Proxcelan Cs-131 seeds for treatment of head and neck tumors, commencing with treatment of a tumor that could not be accessed by other treatment modalities. Upon obtaining clearance in August 2009 from the FDA to permit loading Cesium-131 into bioabsorbable braided strands, this clearance permits the product to be commercially distributed for treatment of lung, head and neck tumors as well as tumors in other organs. During the fiscal year ended June 30, 2010, the Company expanded the number of areas of the body in which the Proxcelan Cs-131 seeds were being utilized for treatment by adding lung cancer in August 2009, colorectal cancer in October 2009, and chest wall cancer in December 2009. During the fiscal year ended June 30, 2012, the Company continued the expansion in the number of areas of the body in which the Proxcelan Cs-131 seeds were being utilized through the addition of the treatment of brain cancer in September 2010 and the treatment of gynecological cancer in December 2010. While the Company believes that it has identified the delivery systems for breast cancer, management focused in fiscal 2012 on obtaining its regulatory clearances and final research and development of its GliaSite® Radiation Therapy System and marketing its brain and lung products. The GliaSite® Radiation Therapy System is the world's only system that enables doctors to use liquid radiation (presently Iodine-125 in liquid form until Cesium-131 is approved for use in liquid form) in areas where the cancer is most likely to remain after brain surgery and tumor removal. While management has not identified new opportunities to expand treatment to other sites in the body, it continues to investigate opportunities with interested physicians and medical facilities. Management is now focusing primarily on the brain and lung markets while the Company is researching delivery systems other than those historically used by the Company.

In March 2011, the Company received clearance to commercially deliver Proxcelan™ Cesium-131 brachytherapy seeds that are preloaded into bioabsorbable braided strands into Europe. This clearance permits the product to be commercially distributed for treatment of lung, head and neck tumors as well as tumors in other organs in Europe.

In August 2011, IsoRay Medical received clearance from the FDA for its premarket notification (510(k)) for the GliaSite® radiation therapy system. The GliaSite® Radiation Therapy System is the only FDA-cleared balloon catheter device used in the treatment of brain cancer.

In May 2012, IsoRay Medical received a CE mark for the GliaSite® Radiation Therapy System which states that the Company conforms with the product requirements of the European Council Directive 93/42/EEC. The CE mark allows the GliaSite® Radiation Therapy System to be sold in 31 European countries and to be marketed in the European Free Trade Associate member states and the European Union.

Our principal executive offices are located at 350 Hills Street, Suite 106, Richland, Washington 99354, and our telephone number is (509) 375-1202. We maintain an Internet website at www.isoray.com. Information on or accessible through our website does not constitute part of this prospectus and should not be relied upon in connection with making any investment decision with respect to the securities offered by this prospectus.

Although our predecessor operating company was organized in 1998, IsoRay, Inc. was incorporated in 1983 in Minnesota and operated under the name Century Park Pictures Corporation until the merger with IsoRay Medical, Inc. on July 28, 2005.

RISK FACTORS

An investment in our securities involves a high degree of risk. Before making an investment decision, you should carefully consider the risks described under "Risk Factors" in the applicable prospectus supplement and in our most recent Annual Report on Form 10-K, or any updates in our Quarterly Reports on Form 10-Q, together with all of the other information appearing in this prospectus or incorporated by reference into this prospectus and any applicable prospectus supplement, in light of your particular investment objectives and financial circumstances. The risks so described are not the only risks facing our company. Additional risks not presently known to us or that we currently deem immaterial may also impair our business operations. Our business, financial condition or results of operations could be materially adversely affected by any of these risks. The trading price of our securities could decline due to any of these risks, and you may lose all or part of your investment.

NOTE REGARDING FORWARD-LOOKING STATEMENTS

In addition to historical information, this prospectus, any prospectus supplement and the documents incorporated by reference herein contain certain "forward-looking statements" within the meaning of the Private Securities Litigation Reform Act of 1995 (PSLRA). This statement is included for the express purpose of availing IsoRay, Inc. of the protections of the safe harbor provisions of the PSLRA.

All statements contained in this prospectus, any prospectus supplement and the documents incorporated by reference herein, other than statements of historical facts, that address future activities, events or developments are forward-looking statements, including, but not limited to, statements containing the words "believe," "expect," "anticipate," "intends," "estimate," "forecast," "project," and similar expressions. All statements other than statements of historical fact are statements that could be deemed forward-looking statements, including any statements of the plans, strategies and objectives of management for future operations; any statements concerning proposed new products, services, developments or industry rankings; any statements regarding future revenue, economic conditions or performance; any statements of belief; and any statements of assumptions underlying any of the foregoing. These statements are based on certain assumptions and analyses made by us in light of our experience and our assessment of historical trends, current conditions and expected future developments as well as other factors we believe are appropriate under the circumstances. However, whether actual results will conform to the expectations and predictions of management is subject to a number of risks and uncertainties that may cause actual results to differ materially.

You should not place undue reliance on our forward-looking statements because the matters they describe are subject to known and unknown risks, uncertainties and other unpredictable factors, many of which are beyond our control. Our forward-looking statements are based on the information currently available to us and speak only as of the date on the cover of this prospectus, the date of any prospectus supplement, or, in the case of forward-looking statements incorporated by reference, as of the date of the filing that includes the statement. New risks and uncertainties arise from time to time, and it is impossible for us to predict these matters or how they may affect us. Over time, our actual results, performance or achievements will likely differ from the anticipated results, performance or achievements that are expressed or implied by our forward-looking statements, and such difference might be significant and materially adverse to our security holders. We do not undertake and specifically decline any obligation to update any forward-looking statements or to publicly announce the results of any revisions to any statements to reflect new information or future events or developments.

We have identified some of the important factors that could cause future events to differ from our current expectations and they are described in this prospectus and supplements to this prospectus under the caption "Risk Factors" as well as in our most recent Annual Report on Form 10-K, including without limitation under the captions "Risk Factors" and "Management's Discussion and Analysis of Financial Condition and Results of Operations" and in other documents that we may file with the SEC, all of which you should review carefully. Please consider our forward-looking statements in light of those risks as you read this prospectus and any prospectus supplement.

USE OF PROCEEDS

We will retain broad discretion over the use of the net proceeds from the sale of our securities offered by us hereby. Except as described in any prospectus supplement, we currently intend to use the net proceeds from the sale of securities offered by us pursuant to this prospectus for working capital, capital expenditures, investments in our subsidiaries, and other general corporate purposes. We may also use such proceeds to fund acquisitions of businesses, technologies or product lines that complement our current business. However, we currently have no commitments or agreements for any specific acquisitions. Pending application of the net proceeds, we intend to invest the net proceeds of the offering of securities by us in investment-grade, interest-bearing securities.

The intended application of proceeds from the sale of any particular offering of securities using this prospectus will be described in the accompanying prospectus supplement relating to such offering. The precise amount and timing of the application of these proceeds will depend on our funding requirements and the availability and costs of other funds.

RATIO OF EARNINGS TO FIXED CHARGES

If we offer debt securities under this prospectus, then we will, if required at the time, provide a ratio of earnings to fixed charges in the applicable prospectus supplement for such offering.

GENERAL DESCRIPTION OF SECURITIES

We may offer and sell, at any time and from time to time:

- shares of our common stock;
- shares of our preferred stock;
- warrants to purchase shares of our common stock, preferred stock and/or debt securities;
- debt securities consisting of debentures, notes or other evidences of indebtedness;
- units consisting of a combination of the foregoing; or
- any combination of these securities.

The terms of any securities we offer will be determined at the time of sale. We may issue debt securities that are exchangeable for and/or convertible into common stock or any of the other securities that may be sold under this prospectus. When particular securities are offered, a supplement to this prospectus will be filed with the SEC, which will describe the terms of the offering and sale of the offered securities.

DESCRIPTION OF CAPITAL STOCK

The following is a summary description of the rights of our common stock and related provisions of our amended Articles of Incorporation and our Bylaws. The following description of our capital stock is intended as a summary only and is qualified in its entirety by reference to our amended Articles of Incorporation and our Bylaws, which are filed as exhibits to the registration statement of which this prospectus forms a part, and to the applicable provisions of Minnesota law.

Common Stock

Our common shares are listed on the NYSE Amex under the symbol "ISR". As of May 1, 2013, 34,611,517 shares of common stock were issued and outstanding.

The Company's Articles of Incorporation provide that the Company has the authority to issue 200 million shares of capital stock, which are currently divided into two classes as follows: 193 million shares of common stock, par value of \$0.001 per share; and 7 million shares of preferred stock, also with a par value of \$0.001 per share.

The holders of our common stock have no preemptive or other subscription rights, and there are no conversion rights or redemption or sinking fund provisions with respect to such shares. All of the outstanding shares of our common stock are, and the shares of our common stock when issued will be, fully paid and nonassessable.

Voting. Holders of the common stock are entitled to one vote per share on all matters to be voted on by the Company's shareholders. The Company's bylaws provide that a majority of the outstanding shares of the corporation entitled to vote constitute a quorum at a meeting of the shareholders.

Dividends. The Company's Board of Directors, in its sole discretion, may declare and pay dividends on the common stock, payable in cash or other consideration, out of funds legally available, if all dividends due on the preferred stock have been declared and paid. The Company has not paid any cash dividends on its common stock and does not plan to pay any cash dividends on its common stock for the foreseeable future.

Liquidation, Subdivision, or Combination. In the event of any liquidation, dissolution or winding up of the Company or upon the distribution of its assets, all assets and funds remaining after payment in full of the Company's debts and liabilities, and after the payment to holders of any then outstanding preferred stock of the full preferential amounts to which they were entitled, would be divided and distributed among holders of the common stock.

Anti-Takeover Effects Of Provisions Of The Articles Of Incorporation. The authorized but unissued shares of our common and preferred stock are available for future issuance without our shareholders' approval. These additional shares may be utilized for a variety of corporate purposes including but not limited to future public or direct offerings to raise additional capital, corporate acquisitions and employee incentive plans. The issuance of such shares may also be used to deter a potential takeover of IsoRay that may otherwise be beneficial to shareholders by diluting the shares held by a potential suitor or issuing shares to a shareholder that will vote in accordance with IsoRay's Board of Directors' desires. A takeover may be beneficial to shareholders because, among other reasons, a potential suitor may

offer shareholders a premium for their shares of stock compared to the then-existing market price.

On February 1, 2007, the Board of Directors of IsoRay, Inc. declared a dividend of one preferred share purchase right (a "Right") for each outstanding Common Share of the par value of \$.001 per share (the "Common Shares") of the Company. The dividend is payable on February 16, 2007 (the "Record Date") to shareholders of record on that date.

Each Right entitles the registered holder to purchase from the Company one one-hundredth of a Series C Junior Participating Preferred Share of the par value of \$.001 per share (the "Preferred Shares") of the Company at a price of \$25 per one one-hundredth of a Preferred Share (the "Purchase Price"), subject to adjustment. The description and terms of the Rights are set forth in a Rights Agreement (the "Rights Agreement"), dated as of February 1, 2007, between the Company and Computershare Trust Company N.A., as Rights Agent (the "Rights Agent").

Initially, the Rights will attach to all certificates representing Common Shares then outstanding and no separate Right Certificates will be distributed. The Rights will separate from the Common Shares and a Distribution Date for the Rights will occur upon the earlier of:

- (i) the close of business on the fifteenth day following a public announcement that a person or group of affiliated or associated persons has become an "Acquiring Person" (i.e., has become, subject to certain exceptions, the beneficial owner of 15% or more of the voting power of the outstanding shares of voting capital stock of the Company in the election of directors), or

(ii) the close of business on the fifteenth day following the first public announcement relating to a tender offer or exchange offer the consummation of which would result in a person or group of affiliated or associated persons becoming, subject to certain exceptions, the beneficial owner of 15% or more of the voting power of the outstanding shares of voting capital stock of the Company in the election of directors (or such later date as may be determined by the Board of Directors of the Company prior to a person or group of affiliated or associated persons becoming an Acquiring Person).

Until the Distribution Date,

(i) the Rights will be evidenced by the Common Share certificates and will be transferred with and only with the Common Shares,

(ii) new Common Share certificates issued after the Record Date upon transfer or new issuance of the Common Shares will contain a notation incorporating the Rights Agreement by reference, and

(iii) the surrender for transfer of any Common Share certificate, even without such notation or a copy of this Summary of Rights attached thereto, will also constitute the transfer of the Rights associated with the Common Shares represented by such certificate.

As promptly as practicable following the Distribution Date, separate certificates evidencing the Rights ("Right Certificates") will be mailed to holders of record of the Common Shares as of the close of business on the Distribution Date and such separate Right Certificates alone will evidence the Rights.

The Rights are not exercisable until the Distribution Date. The Rights will expire on February 16, 2017, unless extended or earlier redeemed or exchanged by the Company as described below.

The Purchase Price payable, and the number of Preferred Shares or other securities or property issuable, upon exercise of the Rights are subject to adjustment from time to time to prevent dilution:

(i) in the event of a stock dividend on, or a subdivision, combination or reclassification of, the Preferred Shares,

(ii) upon the grant to holders of the Preferred Shares of certain rights, options or warrants to subscribe for or purchase Preferred Shares or convertible securities at less than the then current market price of the Preferred Shares, or

(iii) upon the distribution to holders of the Preferred Shares of evidences of indebtedness or assets (excluding regular periodic cash dividends or dividends payable in Preferred Shares) or of subscription rights or warrants (other than those described in clause (ii) hereof).

The number of Preferred Shares issuable upon the exercise of a Right is also subject to adjustment in the event of a dividend on Common Shares payable in Common Shares, or a subdivision, combination or consolidation of the Common Shares.

With certain exceptions, no adjustment in the Purchase Price will be required until cumulative adjustments require an adjustment of at least 1% in the Purchase Price. No fractional Preferred Shares will be issued (other than fractional shares which are integral multiples of one one-hundredth (subject to adjustment) of a Preferred Share, which may, at the election of the Company, be evidenced by depositary receipts) if in lieu thereof a payment in cash is made based on the closing price (pro-rated for the fraction) of the Preferred Shares on the last trading date prior to the date of exercise.

In the event that any person or group of affiliated or associated persons becomes an Acquiring Person, proper provision shall be made so that each holder of a Right, other than Rights that are or were beneficially owned by the Acquiring Person (which will thereafter be void), will thereafter have the right to receive upon exercise thereof at the then current exercise price of the Right that number of Common Shares having a market value of two times the exercise price of the Right, subject to certain possible adjustments.

In the event that, after the Distribution Date or within 15 days prior thereto, the Company is acquired in certain mergers or other business combination transactions or 50% or more of the assets or earning power of the Company and its subsidiaries (taken as a whole) are sold after the Distribution Date or within 15 days prior thereto, each holder of a Right (other than Rights which have become void under the terms of the Rights Agreement) will thereafter have the right to receive, upon exercise thereof at the then current exercise price of the Right, that number of common shares of the acquiring company (or, in certain cases, one of its affiliates) having a market value of two times the exercise price of the Right.

In certain events specified in the Rights Agreement, the Company is permitted to temporarily suspend the exercisability of the Rights.

At any time after a person or group of affiliated or associated persons becomes an Acquiring Person (subject to certain exceptions) and prior to the acquisition by a person or group of affiliated or associated persons of 50% or more of the voting power of the outstanding shares of voting capital stock of the Company in the election of directors, the Board of Directors of the Company may exchange all or part of the Rights (other than Rights which have become void under the terms of the Rights Agreement) for Common Shares or equivalent securities at an exchange ratio per Right equal to the result obtained by dividing the exercise price of a Right by the current per share market price of the Common Shares, subject to adjustment.

At any time prior to such time as a person or group of affiliated or associated persons becomes an Acquiring Person, the Board of Directors of the Company may redeem the Rights in whole, but not in part, at a price of \$.001 per Right, subject to adjustment (the "Redemption Price"), payable in cash. The period of time during which the Rights may be redeemed may be extended by the Board of Directors of the Company if no person has become an Acquiring Person. The redemption of the Rights may be made effective at such time, on such basis and with such conditions as the Board of Directors in its sole discretion may establish. The Board of Directors and the Company shall not have any liability to any person as a result of the redemption or exchange of the Rights pursuant to the provisions of the Rights Agreement.

The terms of the Rights may be amended by the Board of Directors of the Company, subject to certain limitations after such time as a person or group of affiliated or associated persons becomes an Acquiring Person, without the consent of the holders of the Rights, including an amendment prior to the date a person or group of affiliated or associated persons becomes an Acquiring Person to lower the 15% threshold for exercisability of the Rights to not less

than the greater of (i) the sum of .001% and the largest percentage of the outstanding shares of voting capital stock of the Company with voting power in the election of directors then known by the Company to be beneficially owned by any person or group of affiliated or associated persons (subject to certain exceptions) or (ii) 10%.

Until a Right is exercised, the holder thereof, as such, will have no rights as a shareholder of the Company, including, without limitation, the right to vote or to receive dividends.

The foregoing description of the Rights Agreement is qualified in its entirety by reference to the full text of the Rights Agreement.

Transfer Agent and Registrar. The transfer agent and registrar for our common stock is Computershare Trust Company, N.A. The transfer agent's address is 350 Indiana Street, Golden, CO 80401, and its telephone number is (303) 262-0600.

Listing

Our shares of common stock are traded on the NYSE MKT under the ticker symbol "ISR."

DESCRIPTION OF PREFERRED STOCK

We may issue our preferred stock, par value \$0.001 per share, from time to time in one or more series. Of the 7,000,000 shares of presently authorized preferred stock, 1,000,000 are designated as Series A Preferred Stock, 5,000,000 are designated as Series B Preferred Stock, and 1,000,000 are designated as Series C Junior Participating Preferred Stock. The Series C preferred shares are related to the Rights Agreement described above. As of May 1, 2013, no shares of our Series A or Series C preferred stock were outstanding and 59,065 shares of our Series B preferred stock were outstanding.

Series A

Series A preferred shares are entitled to a 10% dividend annually on the stated par value per share. These shares are convertible into shares of common stock at the rate of one share of common stock for each share of Series A preferred stock, and are subject to automatic conversion into common stock upon the closing of an underwritten public offering pursuant to an effective registration statement under the Securities Act of 1933 covering the offer and sale of common stock in which the gross proceeds to the Company are at least \$4 million. Series A preferred shareholders have voting rights equal to the voting rights of common stock, except that the vote or written consent of a majority of the outstanding preferred shares is required for any changes to the Company's Articles of Incorporation, Bylaws or Certificate of Designation, or for any bankruptcy, insolvency, dissolution or liquidation of the Company. Upon liquidation of the Company, the Company's assets are first distributed ratably to the Series A preferred shareholders.

Series B

Series B preferred shares are entitled to a cumulative 15% dividend annually on the stated par value per share. These shares are convertible into shares of common stock at the rate of one share of common stock for each share of Series B preferred stock, and are subject to automatic conversion into common stock upon the closing of an underwritten public offering pursuant to an effective registration statement under the Securities Act of 1933 covering the offer and sale of common stock in which the gross proceeds to the Company are at least \$4 million. Series B preferred shareholders have voting rights equal to the voting rights of common stock, except that the vote or written consent of a majority of the outstanding preferred shares is required for any changes to the Company's Articles of Incorporation, Bylaws or Certificate of Designation, or for any bankruptcy, insolvency, dissolution or liquidation of the Company. Upon liquidation of the Company, the Company's assets are first distributed ratably to the Series A preferred shareholders, then to the Series B preferred shareholders.

Undesignated Preferred Stock

Our certificate of incorporation authorizes our board of directors to issue preferred stock from time to time with such designations, preferences, conversion or other rights, voting powers, restrictions, dividends or limitations as to dividends or other distributions, qualifications or terms or conditions of redemption as shall be determined by the board of directors for each class or series of stock subject to the provisions of our certificate of incorporation. Preferred stock is available for possible future financings or acquisitions and for general corporate purposes without further authorization of stockholders unless such authorization is required by applicable law, the rules of the NYSE MKT or other securities exchange or market on which our stock is then listed or admitted to trading.

The board of directors, without approval of holders of common stock, can issue preferred stock with voting, conversion or other rights that could adversely affect the voting power and other rights of the holders of common stock. Preferred stock could thus be issued quickly with terms calculated to delay or prevent a change in control of or make removal of management more difficult and/or impair the liquidation rights of our common stock. Additionally, the issuance of preferred stock may have the effect of decreasing the market price of the common stock.

If we offer a specific series of new preferred stock under this prospectus, we will describe the terms of the preferred stock in the prospectus supplement for such offering and will file a copy of the certificate establishing the terms of the preferred stock with the SEC. To the extent required, this description will include:

- the title and stated or par value of the preferred stock;

the number of shares of the preferred stock offered, the liquidation preference per share and the offering price of the preferred stock;

the dividend rate(s), period(s) and/or payment date(s) or method(s) of calculation thereof applicable to the preferred stock;

whether dividends shall be cumulative or non-cumulative and, if cumulative, the date from which dividends on the preferred stock shall accumulate;

- the procedures for any auction and remarketing, if any;
- the provisions for a sinking fund, if any, for the preferred stock;
- any voting rights of the preferred stock;
- the provisions for redemption, if applicable, of the preferred stock;
- any listing of the preferred stock on any securities exchange or market;

the terms and conditions, if applicable, upon which the preferred stock will be convertible into our common stock, including the conversion price or the manner of calculating the conversion price and conversion period, and any other terms of conversion (including any anti-dilution provisions, if any);

whether the preferred stock will be exchangeable into debt securities, and, if applicable, the exchange price (or how it will be calculated), the exchange period and any other terms of exchange (including any anti-dilution provisions, if any);

the relative ranking and preferences of the preferred stock as to dividend rights and rights upon liquidation, dissolution or winding up of the affairs of the Company;

- any material limitations on issuance of any series of preferred stock ranking senior to or on a parity with the series of preferred stock as to dividend rights and rights upon liquidation, dissolution or winding up of the Company;

- any other affirmative, negative or other covenants or contractual rights which might be attendant with the specific series of preferred stock;

9

- if appropriate, a discussion of Federal income tax consequences applicable to the preferred stock; and
- any other specific terms, preferences, rights, limitations or restrictions of the preferred stock.

The preferred stock offered by this prospectus, when issued, will not have, or be subject to, any preemptive or similar rights.

DESCRIPTION OF WARRANTS

We may issue warrants for the purchase of shares of our common stock, preferred stock and/or debt securities in one or more series together with other securities or separately, as described in each applicable prospectus supplement. Warrants may be issued independently or together with any preferred stock, common stock, debt securities, and may be attached to or separate from any offered securities. Each series of warrants will be issued under a separate warrant agreement to be entered into between a warrant agent specified in the agreement and us. The warrant agent will act solely as our agent in connection with the warrants of that series and will not assume any obligation or relationship of agency or trust for or with any holders or beneficial owners of warrants. This summary of some provisions of the warrants is not complete. You should refer to the warrant agreement, including the forms of warrant certificate representing the warrants, relating to the specific warrants being offered for the complete terms of the warrant agreement and the warrants. The warrant agreement, together with the terms of the warrant certificate and warrants, will be filed with the SEC in connection with the offering of the specific warrants.

The applicable prospectus supplement will contain, where applicable, the following terms of and other information relating to the warrants:

- the specific designation and aggregate number of, and the price at which we will issue, the warrants;
- the currency or currency units in which the offering price, if any, and the exercise price are payable;
- the designation, amount and terms of the securities purchasable upon exercise of the warrants;

• if applicable, the exercise price for shares of our common stock and the number of shares of common stock to be received upon exercise of the warrants;

• if applicable, the exercise price for shares of our preferred stock, the number of shares of preferred stock to be received upon exercise of the warrants, and a description of that series of our preferred stock;

if applicable, the exercise price for our debt securities, the amount of our debt securities to be received upon exercise of the warrants, and a description of that series of debt securities;

the date on which the right to exercise the warrants will begin and the date on which that right will expire or, if the warrants may not be continuously exercised throughout that period, the specific date or dates on which the warrants may be exercised;

whether the warrants will be issued in fully registered form or bearer form, in definitive or global form or in any combination of these forms, although, in any case, the form of a warrant included in a unit will correspond to the form of the unit and of any security included in that unit;

- any applicable material U.S. federal income tax consequences;

the identity of the warrant agent for the warrants and of any other depositaries, execution or paying agents, transfer agents, registrars or other agents;

the proposed listing, if any, of the warrants or any securities purchasable upon exercise of the warrants on any securities exchange or market;

if applicable, the date from and after which the warrants and the common stock, preferred stock and/or debt securities will be separately transferable;

- if applicable, the minimum or maximum amount of the warrants that may be exercised at any one time;

- information with respect to book-entry procedures, if any;

- the anti-dilution provisions of the warrants, if any;

- any redemption or call provisions;

- whether the warrants are to be sold separately or with other securities as parts of units; and

any additional terms of the warrants, including terms, procedures and limitations relating to the exchange and exercise of the warrants.

Transfer Agent and Registrar

The transfer agent and registrar for any warrants will be set forth in the applicable prospectus supplement.

DESCRIPTION OF DEBT SECURITIES

The following description, together with the additional information we include in any applicable prospectus supplement, summarizes the material terms and provisions of the debt securities that may be offered from time to time under this prospectus. We may issue debt securities, in one or more series, as either senior or subordinated debt or as senior or subordinated convertible debt. While the terms we have summarized below will generally apply to any future debt securities that may be offered under this prospectus, we will describe the particular terms of any debt securities that may be offered in more detail in the applicable prospectus supplement. The terms of any debt securities offered under a prospectus supplement may differ from the terms we describe below.

We may issue secured or unsecured debt securities offered under this prospectus, which may be senior, subordinated or junior subordinated, and which may be convertible and which may be issued in one or more series. We will issue any new senior debt securities under a senior indenture that we will enter into with a trustee named in such senior indenture. We will issue any subordinated debt securities under a subordinated indenture that we will enter into with a trustee named in such subordinated indenture. We will have filed forms of these documents as exhibits to the registration statement, of which this prospectus is a part. The terms of the debt securities will include those set forth in the applicable indenture, any related supplemental indenture and any related securities documents that are made a part of the indenture by the Trust Indenture Act of 1939. You should read the summary below, the applicable prospectus supplement and the provisions of the applicable indenture, any supplemental indenture and any related security documents, if any, in their entirety before investing in our debt securities. We use the term “indentures” to refer to both the senior indentures and the subordinated indentures.

The indentures will be qualified under the Trust Indenture Act of 1939, as amended (the “Trust Indenture Act”). We use the term “trustee” to refer to either a trustee under the senior indenture or a trustee under the subordinated indenture, as applicable.

The following summaries of material provisions of any senior debt securities, any subordinated debt securities and the related indentures are subject to, and qualified in their entirety by reference to, all the provisions of the indentures and any supplemental indenture or related document applicable to a particular series of debt securities. We urge you to read the applicable prospectus supplements related to the debt securities that are offered under this prospectus, as well as the complete indentures, that contains the terms of the debt securities. See the information under the heading “Where You Can Find More Information” for information on how to obtain a copy of the appropriate indenture. Except as we may otherwise indicate, the terms of any senior indenture and any subordinated indenture will be identical.

In addition, the material specific financial, legal and other terms as well as any material U.S. federal income tax consequences particular to securities of each series will be described in the prospectus supplement relating to the securities of that series. The prospectus supplement may or may not modify the general terms found in this prospectus and will be filed with the SEC. For a complete description of the terms of a particular series of debt securities, you should read both this prospectus and the prospectus supplement relating to that particular series.

We will describe in the applicable prospectus supplement the terms relating to a series of debt securities, including:

- title;
- principal amount being offered, and, if a series, the total amount authorized and the total amount outstanding;

- any limit on the amount that may be issued;

whether or not we will issue the series of debt securities in global form and, if so, the terms and who the depositary will be;

- the maturity date;

the principal amount due at maturity, and whether the debt securities will be issued with any original issue discount;

whether and under what circumstances, if any, we will pay additional amounts on any debt securities held by a person who is not a United States person for tax purposes, and whether we can redeem the debt securities if we have to pay such additional amounts;

the annual interest rate, which may be fixed or variable, or the method for determining the rate, the date interest will begin to accrue, the dates interest will be payable and the regular record dates for interest payment dates or the method for determining such dates;

- whether or not the debt securities will be secured or unsecured, and the terms of any secured debt;
 - the terms of the subordination of any series of subordinated debt;
 - the place where payments will be payable;
 - restrictions on transfer, sale or other assignment, if any;
- our right, if any, to defer payment of interest and the maximum length of any such deferral period;

the date, if any, after which, the conditions upon which, and the price at which we may, at our option, redeem the series of debt securities pursuant to any optional or provisional redemption provisions, and any other applicable terms of those redemption provisions;

- provisions for a sinking fund, purchase or other analogous fund, if any;

the date, if any, on which, and the price at which we are obligated, pursuant to any mandatory sinking fund or analogous fund provisions or otherwise, to redeem, or at the holder's option to purchase, the series of debt securities;

- whether the indenture will restrict our ability and/or the ability of our subsidiaries to:
 - incur additional indebtedness;
 - issue additional securities;
 - issue guarantees;

- create liens;
- pay dividends and make distributions in respect of our capital stock and the capital stock of our subsidiaries;
- redeem capital stock;

- place restrictions on our subsidiaries' ability to pay dividends, make distributions or transfer assets;
 - make investments or other restricted payments;
 - sell or otherwise dispose of assets;
 - enter into sale-leaseback transactions;
 - engage in transactions with stockholders and affiliates;
 - issue or sell stock of or sell assets of our subsidiaries; or
 - effect a consolidation or merger;

whether the indenture will require us to maintain any interest coverage, fixed charge, cash flow-based, asset-based or other financial ratios;

a discussion of any material or special United States federal income tax considerations applicable to the debt securities;

- information describing any book-entry features;
- the procedures for any auction and remarketing, if any;

the denominations in which we will issue the series of debt securities, if other than denominations of \$1,000 and any integral multiple thereof;

if other than U.S. dollars, the currency in which the series of debt securities will be denominated and the currency in which principal, premium, if any, and interest will be paid; and

any other specific terms, preferences, rights or limitations of, or restrictions on, the debt securities, including any events of default that are in addition to or different than those described in this prospectus or any covenants provided with respect to the debt securities that are in addition to those described above, and any terms which may be required by us or advisable under applicable laws or regulations or advisable in connection with the marketing of the debt securities.

In addition to the debt securities that may be offered pursuant to this prospectus, we may issue other debt securities in public or private offerings from time to time. These other debt securities may be issued under other indentures or documentation that are not described in this prospectus, and those debt securities may contain provisions materially different from the provisions applicable to one or more issues of debt securities offered pursuant to this prospectus.

Original Issue Discount

One or more series of debt securities offered under this prospectus may be sold at a substantial discount below their stated principal amount, bearing no interest or interest at a rate that at the time of issuance is below market rates. The federal income tax consequences and special considerations applicable to any series of debt securities generally will be described in the applicable prospectus supplement.

Senior Debt Securities

Payment of the principal or premium, if any, and interest on senior debt securities will rank on a parity with all of our other indebtedness that is not subordinated.

Subordination of Subordinated Debt Securities

The subordinated debt securities will be subordinate and junior in priority of payment to certain of our other indebtedness to the extent described in a prospectus supplement. The indentures in the forms initially filed as exhibits to the registration statement of which this prospectus is a part do not limit the amount of indebtedness which we may incur, including senior indebtedness or subordinated indebtedness, and do not limit us from issuing any other debt, including secured debt or unsecured debt.

Conversion or Exchange Rights

We will set forth in the applicable prospectus supplement the terms on which a series of debt securities may be convertible into or exchangeable for our common stock, our preferred stock or other securities, including the conversion or exchange rate, as applicable, or how it will be calculated, and the applicable conversion or exchange period. We will include provisions as to whether conversion or exchange is mandatory, at the option of the holder or at our option. We may include provisions pursuant to which the number of securities that the holders of the series of debt securities receive upon conversion or exchange would, under the circumstance described in those provisions, be subject to adjustment, or pursuant to which those holders would, under those circumstances, receive other property upon conversion or exchange, for example in the event of our merger or consolidation with another entity.

Consolidation, Merger or Sale

The indentures in the forms initially filed as exhibits to the registration statement of which this prospectus is a part do not contain any covenant that restricts our ability to merge or consolidate, or sell, convey, transfer or otherwise dispose of all or substantially all of our assets. However, any successor of ours or acquirer of such assets must assume all of our obligations under the indentures and the debt securities.

If the debt securities are convertible for our other securities, the person with whom we consolidate or merge or to whom we sell all of our property must make provisions for the conversion of the debt securities into securities which the holders of the debt securities would have received if they had converted the debt securities before the consolidation, merger or sale.

Events of Default under the Indentures

Except as otherwise set forth in an applicable prospectus supplement, the following are events of default under the indentures with respect to any series of debt securities that we may issue:

- if we fail to pay interest when due and payable and our failure continues for 30 days and the time for payment has not been extended or deferred;

- if we fail to pay the principal, or premium, if any, when due and payable and the time for payment has not been extended or delayed;

if we fail to observe or perform any other covenant contained in the debt securities or the indentures, other than a covenant solely for the benefit of another series of debt securities, and our failure continues for 90 days after we receive notice from the trustee or holders of a to-be-determined percentage in aggregate principal amount of the outstanding debt securities of the applicable series; and

- if specified events of bankruptcy, insolvency or reorganization occur.

If an event of default with respect to debt securities of any series occurs and is continuing, other than an event of default specified in the last bullet point above under “— Events of Default Under the Indentures,” the trustee or the holders of a to-be-determined percentage in aggregate principal amount of the outstanding debt securities of that series, by notice to us in writing, and to the trustee if notice is given by such holders, may declare the unpaid principal of, premium, if any, and accrued interest, if any, due and payable immediately. If an event of default specified in the last bullet point above “— Events of Default Under the Indentures” occurs with respect to us, the principal amount of and accrued interest, if any, of each series of debt securities then outstanding shall be due and payable without any notice or other action on the part of the trustee or any holder.

The holders of a majority in aggregate principal amount of the outstanding debt securities of an affected series may waive any default or event of default with respect to the series and its consequences (other than bankruptcy defaults), except there may be no waiver of defaults or events of default regarding payment of principal, premium, if any, or interest, unless we have cured the default or event of default in accordance with the applicable indenture.

Subject to the terms of the indentures, if an event of default under an indenture shall occur and be continuing, the trustee will be under no obligation to exercise any of its rights or powers under such indenture at the request or direction of any of the holders of the applicable series of debt securities, unless such holders have offered the trustee indemnity satisfactory to it. The holders of a majority in principal amount of the outstanding debt securities of any series will have the right to direct the time, method and place of conducting any proceeding for any remedy available to the trustee, or exercising any trust or power conferred on the trustee, with respect to the debt securities of that series, provided that:

the direction so given by the holder is not in conflict with any law or the applicable indenture; and

subject to its duties under the Trust Indenture Act of 1939, the trustee need not take any action that might involve it in personal liability or might be unduly prejudicial to the holders not involved in the proceeding.

A holder of the debt securities of any series will only have the right to institute a proceeding under the indentures or to appoint a receiver or trustee, or to seek other remedies if:

the holder has given written notice to the trustee of a continuing event of default with respect to that series;

the holders of a to-be-determined percentage in aggregate principal amount of the outstanding debt securities of that series have made written request to the trustee, and such holders have offered indemnity satisfactory to the trustee, to institute the proceeding as trustee; and

the trustee does not institute the proceeding, and does not receive from the holders of a majority in aggregate principal amount of the outstanding debt securities of that series other conflicting directions, within 90 days after the notice, request and offer.

These limitations do not apply to a suit instituted by a holder of debt securities if we default in the payment of the principal, premium, if any, or interest on, the debt securities.

We will periodically file statements with the trustee regarding our compliance with the covenants in the indentures.

Modification of Indenture; Waiver

We and the trustee may modify an indenture or enter into or modify any supplemental indenture without the consent of any holders of the debt securities with respect to specific matters, including:

- to fix any ambiguity, defect or inconsistency in the indenture;
- to comply with the provisions described above under “—Consolidation, Merger or Sale;”

to comply with any requirements of the Securities and Exchange Commission in connection with the qualification of any indenture under the Trust Indenture Act of 1939;

- to evidence and provide for the acceptance of appointment hereunder by a successor trustee;
- to provide for uncertificated debt securities and to make any appropriate changes for such purpose;

to add to, delete from, or revise the conditions, limitations and restrictions on the authorized amount, terms or purposes of issuance, authorization and delivery of debt securities of any unissued series;

to add to our covenants such new covenants, restrictions, conditions or provisions for the protection of the holders, to make the occurrence, or the occurrence and the continuance, of a default in any such additional covenants, restrictions, conditions or provisions an event of default, or to surrender any of our rights or powers under the indenture; or

to change anything that does not materially adversely affect the legal rights of any holder of debt securities of any series.

In addition, under the indentures, the rights of holders of a series of debt securities may be changed by us and the trustee with the written consent of the holders of at least a majority in aggregate principal amount of the outstanding debt securities of each series that is affected. However, we and the trustee may only make the following changes with the consent of each holder of any outstanding debt securities affected:

- extending the fixed maturity of the series of debt securities;

• reducing the principal amount, reducing the rate of or extending the time of payment of interest, or reducing any premium payable upon the redemption of any debt securities; or

• reducing the percentage of debt securities, the holders of which are required to consent to any supplemental indenture.

Discharge

Each indenture provides that, subject to the terms of the indenture and any limitation otherwise provided in the prospectus supplement applicable to a particular series of debt securities, we can elect to be discharged from our obligations with respect to one or more series of debt securities, except for specified obligations, including obligations to:

- register the transfer or exchange of debt securities of the series;
- replace stolen, lost or mutilated debt securities of the series;

maintain paying agents and agencies for payment, registration of transfer and exchange and service of notices and demands;

- recover excess money held by the trustee;
- compensate and indemnify the trustee; and
- appoint any successor trustee.

In order to exercise our rights to be discharged, we must deposit with the trustee money or government obligations sufficient to pay all the principal of, any premium and interest on, the debt securities of the series on the dates payments are due.

“Street Name” and Other Indirect Holders

Investors who hold securities in accounts at banks or brokers generally will not be recognized by us as legal holders of debt securities. This manner of holding securities is called holding in “street name.” Instead, we would recognize only the bank or broker, or the financial institution that the bank or broker uses to hold its securities. These intermediary banks, brokers and other financial institutions pass along principal, interest and other payments on the debt securities, either because they agree to do so in their customer agreements or because they are legally required to do so. If you hold debt securities in “street name,” you should check with your own institution to find out, among other things:

Edgar Filing: IsoRay, Inc. - Form 424B5

- how it handles payments and notices;
- whether it imposes fees or charges;
- how it would handle voting if applicable;

• whether and how you can instruct it to send you debt securities registered in your own name so you can be a direct holder as described below; and

• if applicable, how it would pursue rights under your debt securities if there were a default or other event triggering the need for holders to act to protect their interests.

Our obligations, as well as the obligations of the trustee under the indentures and those of any third parties employed by us or the trustee under either of the indentures, run only to persons who are registered as holders of debt securities issued under the applicable indenture. As noted above, we do not have obligations to you if you hold in “street name” or other indirect means, either because you choose to hold debt securities in that manner or because the debt securities are issued in the form of global securities as described below. For example, once we make payment to the registered holder, we have no further responsibility for the payment even if that holder is legally required to pass the payment along to you as a “street name” customer but does not do so.

Form, Exchange and Transfer

We may issue debt securities of each series only in fully registered form without coupons and, unless we otherwise specify in the applicable prospectus supplement, in denominations of \$1,000 and any integral multiple thereof. The indentures will provide that we may issue debt securities of a series in temporary or permanent global form and as book-entry securities that will be deposited with, or on behalf of, The Depository Trust Company or another depository named by us and identified in a prospectus supplement with respect to that series (the “Depository”). See “Book-Entry” below for a further description of the terms relating to any book-entry securities.

At the option of the holder, subject to the terms of the indentures and the limitations applicable to global securities described below or in the applicable prospectus supplement, the holder of the debt securities of any series can exchange the debt securities for other debt securities of the same series, in any authorized denomination and of like tenor and aggregate principal amount.

Subject to the terms of the indentures and the limitations applicable to global securities set forth below in the applicable prospectus supplement, holders of the debt securities may present the debt securities for exchange or for registration of transfer, duly endorsed or with the form of transfer endorsed thereon duly executed if so required by us or the security registrar, at the office of the security registrar or at the office of any transfer agent designated by us for this purpose. Unless otherwise provided in the debt securities that the holder presents for transfer or exchange, we will make no service charge for any registration of transfer or exchange, but we may require payment of any taxes or other governmental charges.

We will name in the applicable prospectus supplement the security registrar, and any transfer agent in addition to the security registrar, that we initially designate for any debt securities. We may at any time designate additional transfer agents or rescind the designation of any transfer agent or approve a change in the office through which any transfer agent acts, except that we will be required to maintain a transfer agent in each place of payment for the debt securities of each series.

If we elect to redeem the debt securities of any series, we will not be required to:

issue, register the transfer of, or exchange any debt securities of any series being redeemed in part during a period beginning at the opening of business 15 days before the day of mailing of a notice of redemption of any debt securities that may be selected for redemption and ending at the close of business on the day of the mailing; or

register the transfer of or exchange any debt securities so selected for redemption, in whole or in part, except the unredeemed portion of any debt securities we are redeeming in part.

Book-Entry Securities

The following description of book-entry securities will apply to any series of debt securities issued in whole or in part in the form of one or more global securities, except as otherwise described in a related prospectus supplement.

Book-entry securities of like tenor and having the same date will be represented by one or more global securities deposited with and registered in the name of a depository that is a clearing agent registered under the Securities Exchange Act of 1934, as amended, or the Exchange Act. Beneficial interests in book-entry securities will be limited to institutions that have accounts with the depository, or “participants,” or persons that may hold interests through participants.

Ownership of beneficial interests by participants will only be evidenced by, and the transfer of that ownership interest will only be effected through, records maintained by the depository. Ownership of beneficial interests by persons that hold through participants will only be evidenced by, and the transfer of that ownership interest within such participant will only be effected through, records maintained by the participants. The laws of some jurisdictions require that certain purchasers of securities take physical delivery of such securities in definitive form. Such laws may impair the ability to transfer beneficial interests in a global security.

Payment of principal of and any premium and interest on book-entry securities represented by a global security registered in the name of or held by a depository will be made to the depository, as the registered owner of the global security. Neither we, the trustee nor any agent of ours or the trustee will have any responsibility or liability for any aspect of the depository’s records or any participant’s records relating to or payments made on account of beneficial ownership interests in a global security or for maintaining, supervising or reviewing any of the depository’s records or any participant’s records relating to the beneficial ownership interests. Payments by participants to owners of beneficial interests in a global security held through such participants will be governed by the depository’s procedures, as is now the case with securities held for the accounts of customers registered in “street name,” and will be the sole responsibility of such participants.

A global security representing a book-entry security is exchangeable for definitive debt securities in registered form, of like tenor and of an equal aggregate principal amount registered in the name of, or is transferable in whole or in part to, a person other than the depository for that global security, only if (i) the depository notifies us that it is unwilling or unable to continue as depository for that global security or the depository ceases to be a clearing agency registered under the Exchange Act, (ii) there shall have occurred and be continuing an event of default with respect to the debt securities of that series or (iii) other circumstances exist that have been specified in the terms of the debt securities of that series. Any global security that is exchangeable pursuant to the preceding sentence shall be registered in the name or names of such person or persons as the depository shall instruct the trustee. It is expected that such instructions may be based upon directions received by the depository from its participants with respect to ownership of beneficial interests in such global security.

Except as provided above, owners of beneficial interests in a global security will not be entitled to receive physical delivery of debt securities in definitive form and will not be considered the holders thereof for any purpose under the indentures, and no global security shall be exchangeable, except for a security registered in the name of the depository. This means each person owning a beneficial interest in such global security must rely on the procedures of the depository and, if such person is not a participant, on the procedures of the participant through which such person owns its interest, to exercise any rights of a holder under the indentures. We understand that under existing industry

practices, if we request any action of holders or an owner of a beneficial interest in such global security desires to give or take any action that a holder is entitled to give or take under the indentures, the depositary would authorize the participants holding the relevant beneficial interests to give or take such action, and such participants would authorize beneficial owners owning through such participant to give or take such action or would otherwise act upon the instructions of beneficial owners owning through them.

Information Concerning the Trustee

The trustee, other than during the occurrence and continuance of an event of default under an indenture, undertakes to perform only those duties as are specifically set forth in the applicable indenture and is under no obligation to exercise any of the powers given it by the indentures at the request of any holder of debt securities unless it is offered reasonable security and indemnity against the costs, expenses and liabilities that it might incur. However, upon an event of default under an indenture, the trustee must use the same degree of care as a prudent person would exercise or use in the conduct of his or her own affairs.

Payment and Paying Agents

Unless we otherwise indicate in the applicable prospectus supplement, we will make payment of the interest on any debt securities on any interest payment date to the person in whose name the debt securities, or one or more predecessor securities, are registered at the close of business on the regular record date for the interest.

We will pay principal of and any premium and interest on the debt securities of a particular series at the office of the paying agents designated by us, except that, unless we otherwise indicate in the applicable prospectus supplement, we may make interest payments by check which we will mail to the holder or by wire transfer to certain holders. Unless we otherwise indicate in a prospectus supplement, we will designate an office or agency of the trustee in the City of New York as our paying agent for payments with respect to debt securities of each series. We will name in the applicable prospectus supplement any other paying agents that we initially designate for the debt securities of a particular series. We will maintain a paying agent in each place of payment for the debt securities of a particular series.

All money we pay to a paying agent or the trustee for the payment of the principal of or any premium or interest on any debt securities which remains unclaimed at the end of two years after such principal, premium or interest has become due and payable will be repaid to us, and the holder of the debt security thereafter may look only to us for payment thereof.

Governing Law

Except as otherwise specified in the applicable prospectus supplement, the indentures and the debt securities will be governed by and construed in accordance with the laws of the State of New York, except to the extent that the Trust Indenture Act of 1939 is applicable.

DESCRIPTION OF UNITS

We may issue units composed of one or more of the other securities described in this prospectus in any combination. Each unit will be issued so that the holder of the unit is also the holder of each security included in the unit. Thus, the holder of a unit will have the rights and obligations of a holder of each included security. The unit agreement under which a unit is issued may provide that the securities included in the unit may not be held or transferred separately, at any time or at any time before a specified date.

The applicable prospectus supplement may describe:

- the designation and terms of the units and of the securities comprising the units, including whether and under what circumstances those securities may be held or transferred separately;

- any provisions for the issuance, payment, settlement, transfer or exchange of the units or of the securities comprising the units;

- the terms of the unit agreement governing the units;
- United States federal income tax considerations relevant to the units; and
- whether the units will be issued in fully registered or global form.

The preceding description and any description of units in the applicable prospectus supplement does not purport to be complete and is subject to and is qualified in its entirety by reference to the unit agreement and, if applicable, collateral arrangements and depositary arrangements relating to such units.

PLAN OF DISTRIBUTION

We may sell the securities offered through this prospectus (i) to or through underwriters or dealers, (ii) directly to purchasers, including our affiliates, (iii) through agents, or (iv) through a combination of any these methods. The securities may be distributed at a fixed price or prices, which may be changed, market prices prevailing at the time of sale, prices related to the prevailing market prices, or negotiated prices. The prospectus supplement will include the following information:

• the terms of the offering;

• the names of any underwriters or agents;

• the name or names of any managing underwriter or underwriters;

• the purchase price of the securities;

• any over-allotment options under which underwriters may purchase additional securities from us;

• the net proceeds from the sale of the securities;

• any delayed delivery arrangements;

• any underwriting discounts, commissions and other items constituting underwriters' compensation;

• any initial public offering price;

• any discounts or concessions allowed or reallocated or paid to dealers;

any commissions paid to agents; and

any securities exchange or market on which the securities may be listed.

Sale Through Underwriters or Dealers

Only underwriters named in the prospectus supplement are underwriters of the securities offered by the prospectus supplement.

If underwriters are used in the sale, the underwriters will acquire the securities for their own account, including through underwriting, purchase, security lending or repurchase agreements with us. The underwriters may resell the securities from time to time in one or more transactions, including negotiated transactions. Underwriters may sell the securities in order to facilitate transactions in any of our other securities (described in this prospectus or otherwise), including other public or private transactions and short sales. Underwriters may offer securities to the public either through underwriting syndicates represented by one or more managing underwriters or directly by one or more firms acting as underwriters.

Unless otherwise indicated in the prospectus supplement, the obligations of the underwriters to purchase the securities will be subject to certain conditions, and the underwriters will be obligated to purchase all the offered securities if they purchase any of them. The underwriters may change from time to time any initial public offering price and any discounts or concessions allowed or reallocated or paid to dealers.

If dealers are used in the sale of securities offered through this prospectus, we will sell the securities to them as principals. They may then resell those securities to the public at varying prices determined by the dealers at the time of resale. The prospectus supplement will include the names of the dealers and the terms of the transaction.

The maximum compensation or discount to be received by any FINRA member or independent broker-dealer will not be greater than 8% for the sale of any securities being registered hereunder pursuant to Rule 415 of the Securities Act.

Direct Sales and Sales Through Agents

We may sell the securities offered through this prospectus directly. In this case, no underwriters or agents would be involved. Such securities may also be sold through agents designated from time to time. The prospectus supplement will name any agent involved in the offer or sale of the offered securities and will describe any commissions payable to the agent. Unless otherwise indicated in the prospectus supplement, any agent will agree to use its reasonable best efforts to solicit purchases for the period of its appointment.

We may sell the securities directly to institutional investors or others who may be deemed to be underwriters within the meaning of the Securities Act with respect to any sale of those securities. The terms of any such sales will be described in the prospectus supplement.

Delayed Delivery Contracts

If the prospectus supplement indicates, we may authorize agents, underwriters or dealers to solicit offers from certain types of institutions to purchase securities at the public offering price under delayed delivery contracts. These contracts would provide for payment and delivery on a specified date in the future. The contracts would be subject only to those conditions described in the prospectus supplement. The applicable prospectus supplement will describe the commission payable for solicitation of those contracts.

Market Making, Stabilization and Other Transactions

We may elect to list offered securities on an exchange or in the over-the-counter market. Any underwriters that we use in the sale of offered securities may make a market in such securities, but may discontinue such market making at any time without notice. Therefore, we cannot assure you that the securities will have a liquid trading market.

Certain persons participating in an offering may engage in overallotment, stabilizing transactions, syndicate covering transactions and penalty bids in accordance with rules and regulations under the Exchange Act. Overallotment involves the sale in excess of the offering size, which create a short position. Stabilizing transactions involve bids to purchase the underlying security in the open market for the purpose of pegging, fixing or maintaining the price of the securities. Syndicate covering transactions involve purchases of the securities in the open market after the distribution has been completed in order to cover syndicate short positions.

Penalty bids permit the underwriters to reclaim a selling concession from a syndicate member when the securities originally sold by the syndicate member are purchased in a syndicate covering transaction to cover syndicate short positions. Stabilizing transactions, syndicate covering transactions and penalty bids may cause the price of the securities to be higher than it would be in the absence of the transactions. The underwriters may, if they commence these transactions, discontinue them at any time.

General Information

Agents, underwriters, and dealers may be entitled, under agreements entered into with us, to indemnification by us against certain liabilities, including liabilities under the Securities Act. Our agents, underwriters, and dealers, or their affiliates, may be customers of, engage in transactions with or perform services for us, in the ordinary course of business.

LEGAL MATTERS

Certain legal matters with respect to the securities being offered hereby will be passed on by Keller Rohrback, PLC, Phoenix, Arizona. Certain partners of Keller Rohrback, PLC hold common stock of the Company, which in the aggregate equal less than one-quarter of a percent (0.25%) of the total issued and outstanding shares of our common stock.

EXPERTS

DeCoria, Maichel & Teague, P.S., independent registered public accounting firm, has audited our consolidated balance sheets as of June 30, 2012 and June 30, 2011, and related consolidated statements of operations, shareholders' equity and cash flows for the years ended June 30, 2012 and 2011, included in our Annual Report on Form 10-K for the fiscal year ended June 30, 2012, as set forth in their report, which is incorporated by reference in this prospectus and elsewhere in the registration statement. Our financial statements are incorporated by reference in reliance on DeCoria, Maichel & Teague, P.S.'s report, given on the authority of said firm as experts in accounting and auditing.

INTERESTS OF NAMED EXPERTS AND COUNSEL

None.

MATERIAL CHANGES

None.

WHERE YOU CAN FIND MORE INFORMATION

We have filed a registration statement on Form S-3 with the SEC relating to the securities offered by this prospectus. This prospectus does not contain all of the information set forth in the registration statement and the exhibits and schedules thereto. We have omitted parts of the registration statement, as permitted by the rules and regulations of the SEC. Statements contained in this prospectus as to the contents of any contract or other document referred to are not necessarily complete and in each instance reference is made to the copy of such contract or other document filed as an exhibit to the registration statement, each such statement being qualified in all respects by such reference. For further information with respect to us and the securities offered hereby, reference is made to such registration statement, exhibits and schedules.

We are subject to the information and periodic reporting requirements of the Exchange Act, and in accordance therewith file periodic reports, current reports, proxy statements and other information with the SEC. Such periodic reports, current reports, proxy statements, other information and a copy of this registration statement on Form S-3 may be inspected by anyone without charge and copies of these materials may be obtained upon the payment of the fees prescribed by the SEC, at the Public Reference Room maintained by the SEC at 100 F Street, N.E., Washington, D.C. 20549. The public may obtain information on the operation of the Public Reference Room by calling the SEC at 1-800-SEC-0330. This registration statement on Form S-3 and the periodic reports, current reports, proxy statements and other information filed by us are also available through the Internet web site maintained by the SEC at the following address: <http://www.sec.gov>.

INCORPORATION BY REFERENCE

This prospectus is part of a registration statement filed with the SEC. The SEC allows us to “incorporate by reference” into this prospectus the information that we file with them, which means that we can disclose important information to you by referring you to those documents. The information incorporated by reference is considered to be part of this prospectus, and information that we file later with the SEC will automatically update and supersede this information. The following documents were filed with the SEC pursuant to the Exchange Act and are incorporated by reference and made a part of this prospectus:

• Annual Report on Form 10-K for the fiscal year ended June 30, 2012, filed on September 28, 2012 and amended on October 26, 2012;

• Quarterly Reports on Form 10-Q for the fiscal quarters ended September 30, 2012, December 31, 2012 and March 31, 2013, filed on November 14, 2012, February 14, 2013 and May 15, 2013;

• Current Reports on Form 8-K filed on July 16, 2012, September 28, 2012, November 14, 2012, January 15, 2013, January 22, 2013, February 14, 2013, February 27, 2013 and May 15, 2013, and the amended Current Reports on Form 8-K/A filed on July 17, 2012 and March 21, 2013;

- Proxy Statement on Schedule 14A filed on January 8, 2013;

• the description of our common stock contained in our Registration Statement on Form 8-A filed with the SEC on April 12, 2007 (File No. 001-333407), including any amendments or reports filed for the purpose of updating such description;

• the description of our rights contained in our Registration Statement on Form 8-A filed on February 7, 2007 (File No. 001-14247), including any amendments or reports filed for the purpose of updating such description; and

• all documents subsequently filed by us pursuant to Sections 13(a), 13(c), 14 and 15(d) of the Securities Exchange Act of 1934, as amended (the “Exchange Act”), (i) after the date on which this registration statement that includes this prospectus was initially filed with the SEC and prior to the effectiveness of such registration statement, and (ii) after the date of this prospectus and prior to the termination of this offering, unless otherwise stated therein.

Notwithstanding the foregoing, information furnished under Items 2.02 and 7.01 of any Current Report on Form 8-K, including the related exhibits, is not incorporated by reference in this prospectus.

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

We will provide without charge to each person to whom this prospectus is delivered, upon oral or written request, a copy of any or all of the foregoing documents incorporated herein by reference (other than exhibits to such documents unless such exhibits are specifically incorporated by reference into the information that this prospectus incorporates). Written or telephone requests should be directed to: IsoRay, Inc., 350 Hills Street, Suite 106, Richland, Washington 99354, telephone number (509) 375-1202, Attn: Corporate Secretary.

You should rely only on the information contained or incorporated by reference in this prospectus or any prospectus supplement. We have not authorized anyone else to provide you with different or additional information. We will not make an offer of these securities in any state where the offer is not permitted. You should not assume that the information in this prospectus or any supplement is accurate as of any date other than the date of those documents.

COMMISSION POSITION ON INDEMNIFICATION FOR SECURITIES ACT LIABILITIES

The Company's Articles of Incorporation provide to directors and officers indemnification to the full extent provided by law, and provide that, to the extent permitted by Minnesota law, a director will not be personally liable for monetary damages to the Company or its shareholders for breach of his or her fiduciary duty as a director, except for liability for certain actions that may not be limited under Minnesota law. On July 1, 2006, the Company entered into Indemnification Agreements with each of its directors and executive officers, and the Company intends to enter into substantially identical agreements with any officers and directors who take office in the future. The purpose of the Indemnification Agreements is to provide all officers and directors with indemnification to the fullest extent permitted under the Minnesota Business Corporations Act.

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