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

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**Post-Effective Amendment No. 1 to  
FORM S-3  
REGISTRATION STATEMENT  
UNDER THE SECURITIES ACT OF 1933**

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**ADVANCED EMISSIONS SOLUTIONS, INC.**  
(Exact name of registrant as specified in its charter)

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**Delaware**  
(State or other jurisdiction of  
incorporation or organization)

**27-5472457**  
(I.R.S. Employer  
Identification No.)

**9135 South Ridgeline Boulevard  
Suite 200  
Highlands Ranch, Colorado 80129  
(303) 734-1727**  
(Address, Including Zip Code, and Telephone Number, Including Area Code,  
of Registrant's Principal Executive Offices)

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**Mark H. McKinnies  
9135 South Ridgeline Boulevard,  
Suite 200,  
Highlands Ranch, Colorado 80129  
(303) 734-1727**  
(Name, Address, Including Zip Code, and Telephone Number, Including Area  
Code, of Agent For Service)

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*Copies to:*

**Julie A. Herzog, Esq.  
Kip Wallen, Esq.  
Fortis Law Partners LLC  
1900 Wazee Street, Suite 300  
Denver, CO 80202  
(303) 295-9700**

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Approximate date of commencement of proposed sale to the public: From time to time after this registration statement becomes effective.

If the only securities being registered on this Form are being offered pursuant to dividend or interest reinvestment plans, please check the following box.

If any of the securities being registered on this Form are to be offered on a delayed or continuous basis pursuant to Rule 415 under the Securities Act of 1933, other than securities offered only in connection with dividend or interest reinvestment plans, check the following box.

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

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

If this Form is a registration statement pursuant to General Instruction I.D. or a post-effective amendment thereto that shall become effective upon filing with the Commission pursuant to Rule 462(e) under the Securities Act, check the following box.

If this Form is a post-effective amendment to a registration statement filed pursuant to General Instruction I.D. filed to register additional securities or additional classes of securities pursuant to Rule 413(b) under the Securities Act, check the following box.

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, or a smaller reporting company. See the definitions of “large accelerated filer,” “accelerated filer” and “smaller reporting company” in Rule 12b-2 of the Exchange Act.

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**Table of Contents**Large accelerated filer Accelerated filer Non-accelerated filer  (Do not check if a smaller reporting company)Smaller reporting company 

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**CALCULATION OF REGISTRATION FEE**

Title of each class of securities to be registered	Amount to be registered (2)	Proposed maximum offering price per unit (1)	Proposed maximum aggregate offering Price (1)	Amount of registration Fee
Common Stock, no par value	262,499	\$5.90	\$1,548,744	\$110.43

- (1) Estimated solely for the purpose of calculating the registration fee in accordance with Rule 457 under the Securities Act. The price per share and aggregate offering price are based on the average of the high and low sales prices of the predecessor registrant's common stock on May 25, 2010, as reported on the NASDAQ Capital Market.
- (2) The 262,499 shares were registered pursuant to the Registration Statement of ADA-ES, Inc. on Form S-3, as amended, filed with the Securities and Exchange Commission on May 28, 2010 (File No. 333-167188) (the "Registration Statement"). In addition, pursuant to Rule 416 under the Securities Act, the Registration Statement also covers such additional number of shares of common stock issuable upon stock splits, stock dividends, distributions, recapitalizations or similar events with respect to the 262,499 shares of common stock being registered pursuant to this registration statement.
- (3) Previously paid against Form S-3 filed with the Securities & Exchange Commission on May 28, 2010. The registration fee was calculated at the then-statutory rate of \$71.30 per \$1,000,000 of securities registered. This Post-Effective Amendment No. 1 does not register any additional amount of securities.

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

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**EXPLANATORY NOTE**

On July 1, 2013, ADA-ES, Inc., a Colorado corporation (the “Predecessor Registrant” or “ADA”), merged with ADA Merger Corp., a Colorado corporation and wholly owned subsidiary of Advanced Emissions Solutions, Inc., a Delaware corporation (the “Registrant” or “ADES”), pursuant to an Agreement and Plan of Merger, dated as of March 25, 2013 (the “Reorganization Agreement”), whereby the Predecessor Registrant, as the surviving corporation of the merger, became a wholly owned subsidiary of the Registrant (such transaction, the “Reorganization”). The Reorganization was adopted and recommended to shareholders by the Board of Directors of the Predecessor Registrant on February 6, 2013 and approved by shareholders of the Predecessor Registrant at the Annual Meeting of Shareholders held on June 13, 2013. At the effective time of the Reorganization, each outstanding share of common stock of the Predecessor Registrant was converted into one share of common stock of the Registrant, and the Registrant replaced the Predecessor Registrant as the publicly held company. The issuance of the shares of common stock of the Registrant was registered under the Securities Act of 1933, as amended (the “Securities Act”) pursuant to the Registrant’s Registration Statement on Form S-4, which was declared effective by the Securities and Exchange Commission (the “SEC”) on April 23, 2013 (File No. 333-187505). As with shares of common stock of the Predecessor Registrant prior to the Reorganization, shares of common stock of the Registrant trade on the NASDAQ Capital Market under the symbol “ADES.”

The Reorganization resulted in the creation of a holding company structure with the Registrant as the holding company and the Predecessor Registrant as an operating company. The business, operations, assets and liabilities of the Predecessor Registrant after the Reorganization are substantially the same as they were prior to Reorganization except for certain equity plans that were assumed by the Registrant pursuant to the Reorganization Agreement.

The Predecessor Registrant filed a Registration Statement on Form S-3, as amended, with the SEC on May 28, 2010 (File No. 333-167188) (the “Registration Statement”). The Registration Statement provides for the resale by the Registrant’s stockholder named under the caption “Selling Stockholder” in this Post-Effective Amendment from time to time of up to 262,499 shares of the Predecessor Registrant’s common stock. On March 15, 2012, the SEC issued correspondence to the Predecessor Registrant stating that it would not object to the Registrant, as successor to the Predecessor Registrant, making ongoing offerings of securities under the Registration Statement provided that the Registrant adopts the Registration Statement by filing a post-effective amendment. Pursuant to Rule 414 under the Securities Act, the Registrant files this Post-Effective Amendment No. 1 to the Registration Statement to expressly adopt the Registration Statement as its own for all purposes of the Securities Act and the Securities Exchange Act of 1934, as amended.

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**The information in this prospectus is not complete and may be changed. The selling stockholder named in this prospectus may not sell these securities until the registration statement filed with the Securities and Exchange Commission is effective. This prospectus is not an offer to sell these securities and is not soliciting an offer to buy these securities in any state where the offer or sale is not permitted.**

**Subject to completion, dated July 3, 2013**

**PROSPECTUS**

262,499 SHARES

# **ADVANCED EMISSIONS SOLUTIONS, INC.**

COMMON STOCK, PAR VALUE \$0.001 PER SHARE

Advanced Emissions Solutions, Inc. (“ADES” or “we”) has prepared this prospectus to register for resale by one of our stockholders of up to 262,499 shares of our common stock that ADA-ES, Inc. (the “Predecessor Registrant” or “ADA”) sold to such stockholder pursuant to the private placements described on page 1 of this prospectus.

The selling stockholder identified in this prospectus, or its permitted pledgees, donees, transferees or other successors-in-interest, may offer the shares from time to time through public or private transactions at prevailing market prices, at prices related to prevailing market prices or at privately negotiated prices. We are not selling any shares of common stock and will not receive any proceeds from the sale of the shares under this prospectus.

We have agreed to bear all of the expenses incurred in connection with the registration of these shares. The selling stockholder will pay or assume brokerage commissions and similar charges incurred for the sale of these shares of our common stock.

Our common stock is listed on the NASDAQ Capital Market under the symbol “ADES.” On July 1, 2013, the reported last sale price of ADA’s common stock on the NASDAQ Capital Market was \$41.00 per share. You are urged to obtain current market quotations for the common stock.

**INVESTING IN OUR COMMON STOCK INVOLVES A HIGH DEGREE OF RISK. SEE “[RISK FACTORS](#)” BEGINNING ON PAGE 2 OF THIS PROSPECTUS.**

**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 \_\_\_\_\_, 2013.

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The address of our principal executive office is 9135 South Ridgeline Boulevard, Suite 200, Highlands Ranch, Colorado 80129, and our telephone number is (303) 734-1727.

Unless the context otherwise requires, references in this prospectus to “ADES,” “we,” “us,” and “our” refer to Advanced Emissions Solutions, Inc. and our consolidated subsidiaries.

We have not authorized anyone to provide you with information different from that contained or incorporated by reference in this prospectus. The selling stockholder is offering to sell, and seeking offers to buy, shares of our common stock only in jurisdictions where offers and sales are permitted. The information contained in this prospectus is accurate only as of the date of this prospectus, regardless of the time of delivery of this prospectus or of any sale of common stock.

**PROSPECTUS SUMMARY**

*This summary highlights important features of this offering and the information included or incorporated by reference in this prospectus. This summary does not contain all of the information that you should consider before investing in our common stock. You should read the entire prospectus carefully (including the documents that are incorporated by reference from the other filings we make with the U.S. Securities and Exchange Commission), with particular attention to the risks of investing in our common stock discussed under “Risk Factors.”*

**Our Business**

Advanced Emissions Solutions, Inc., a Delaware corporation incorporated in 2011, is the publicly held holding company for the operating companies ADA and BCSI, LLC (“BCSI”). Incorporated in Colorado in 1997, ADA is a leader in clean coal technology and the associated specialty chemicals, serving the U.S. and Canadian coal-fueled power plant industry. ADA’s proprietary environmental technologies and specialty chemicals enable power plants to enhance existing air pollution control equipment, minimize mercury, CO<sub>2</sub> and other emissions, maximize capacity, and improve operating efficiencies, to meet the challenges of existing and pending emission control regulations. ADA-ES became a “stand-alone” public company through a “spin-off” from its previous parent company, Earth Sciences, Inc. in September 2003 and became a wholly owned subsidiary of ADES by virtue of a reorganization on July 1, 2013. ADA’s approach to technology development, implementation and commercialization involves taking technology to full-scale as quickly as we can, and testing and improving the technology under actual power plant operating conditions. The most significant benefit of this method is that we begin working early and closely with power companies to optimize the technology to meet their specific needs. For example, while some other companies develop mercury control technologies in the isolation of a laboratory without feedback from users, we work on full-scale mercury control systems that are installed on plants operated by several of the largest power companies in the United States and Canada. We assist electric utility companies to remain competitive while meeting environmental regulations.

Our major activities include:

- the development and marketing of our patented refined coal technology, CyClean, for control of NO<sub>x</sub> and mercury, which also qualifies for certain tax credits, through Clean Coal Solutions, LLC (“Clean Coal”), ADA’s joint venture with NexGen Refined Coal, LLC, an affiliate of NexGen Resources Corporation, and GSFS Investments I Corp., an affiliate of The Goldman Sachs Group, Inc.
- the development and marketing of ADA’s patent pending M-45™ and M-45-PC™ technologies for Circulating Fluidized Boilers and Pulverized Coal boilers, respectively, which also qualifies for certain tax credits, and which complements and expands ADA’s market for RC beyond the CyClean technology, which is limited to cyclone boilers,
- the sale of equipment, field testing and services related to emission control (“EC”) including mercury for coal-fired boilers used in electric generation,
- under an exclusive development and licensing agreement with Arch Coal, Inc. (“Arch Coal”), development and commercialization of an enhanced Powder River Basin (“PRB”) coal with reduced emissions of mercury and other metals,
- the research and development of carbon dioxide (“CO<sub>2</sub>”) capture technology through contracts supported by the Department of Energy (“DOE”) and industry participants, and
- the sale of flue gas conditioning equipment and chemicals, and other chemicals and technologies for coal-fired boilers.

BCSI is a custom designer and fabricator of engineered emissions control technologies, bulk material handling equipment, bulk storage systems, water/waste water treatment equipment, and custom components. BCSI’s technical solutions serve a wide range of industrial clients including; coal fired utilities, water treatment, waste water, cement kilns, food processing and industrial boilers. BCSI employs engineers and trade professionals at a 190,000+sq. ft. fabrication and office facility located in McKeesport, PA.

**Private Placements**

On March 23, 2010, ADA entered into a Subscription Agreement with Arch Coal, Inc. We refer to Arch Coal, Inc. in this prospectus interchangeably as “Arch Coal” and the “selling stockholder.” The Subscription Agreement provided for the issuance and sale by ADA to Arch Coal of an aggregate of 143,885 shares of our common stock at \$6.95 per share. In connection with the sale of the shares of ADA’s common stock to Arch Coal, ADA did not incur any fees to placement agents for the transaction. ADA issued these shares of common stock in reliance on an exemption from registration pursuant to Section 4(2) of the Securities Act of 1933, as amended, and Rule 506 of Regulation D promulgated thereunder. ADA registered for resale the shares of common stock issued to Arch Coal in the March 23, 2010 private placement under its Registration Statement on Form S-3 filed with the Securities and Exchange Commission (the “SEC”) on May 28, 2010, as amended (File No. 333-167188) (the “Registration Statement”). ADA was required to register these shares pursuant to a Registration Rights Agreement it entered into with Arch Coal in connection with this private placement.

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In addition, the Registration Statement covered the resale of 118,614 shares of ADA's common stock previously issued to Arch Coal in a 2003 private placement for \$8.43 per share, and subsequently registered for resale pursuant to a registration statement filed with the SEC on October 18, 2004 (SEC File No. 333-119795). The shares registered on the prior registration statement have been removed from registration thereunder and, instead, were registered for resale under the Registration Statement of which this prospectus is a part, effective upon the effectiveness of this Post-Effective Amendment No. 1 to the Registration Statement.

### THE OFFERING

Common stock offered by selling stockholder	262,499 shares
Use of proceeds	We will not receive any proceeds from sales of our common stock, if any, by the selling stockholder.
Risk Factors	See "Risk Factors" beginning on page 2 and other information included in this prospectus for a discussion of factors you should carefully consider before deciding to invest in the shares.
NASDAQ Capital Market symbol	ADES

### RISK FACTORS

You should carefully consider the specific risks set forth under the caption "Risk Factors" in the applicable prospectus supplement and in ADA's annual report on Form 10-K for the year ended December 31, 2012 and Part II Item 1A of ADA's Quarterly Report on Form 10-Q for the quarter ended March 31, 2013, filed with the SEC by ADA (File No. 000-50216), as well as any amendments thereto reflected in subsequent filings with the SEC, and in any of our other filings with the SEC pursuant to Sections 13(a), 13(c), 14 or 15(d) of the Exchange Act that are incorporated by reference herein, before making an investment decision. For more information, see "Information Incorporated by Reference" below.

### SPECIAL NOTE REGARDING FORWARD-LOOKING INFORMATION

This prospectus includes and incorporates forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended (the "Securities Act"), and Section 21E of the Securities Exchange Act of 1934, as amended (the "Exchange Act"). All statements, other than statements of historical facts, included or incorporated in this prospectus regarding our strategy, future operations, financial position, future revenues, projected costs, prospects, plans and objectives of management are forward-looking statements. The words "anticipates," "believes," "estimates," "expects," "intends," "may," "plans," "projects," "will," and "would," the negative expressions of such statements, and similar expressions are intended to identify forward-looking statements, although not all forward-looking statements contain these identifying words. Forward-looking statements included or incorporated in this prospectus include, without limitation, statements regarding the following:

- (a) the scope and impact of mercury and other regulations or pollution control requirements, including the impact of the final Mercury and Air Toxics Standards ("MATS");
- (b) expected growth in and potential size of our target markets;
- (c) expected supply and demand for our products and services;
- (d) the effectiveness of our technologies and the benefits they provide;
- (e) the timing of awards of, and work under, our contracts and agreements and their value and their availability;
- (f) expected production levels at our refined coal ("RC") facilities, when those RC facilities will be placed into continuous operation, the expected use of the tax credits under Section 45 of the Internal Revenue Code ("Section 45 tax credits") generated by the RC facilities and the expected future value of Section 45 tax credits;
- (g) our ability to profitably sell, lease and/or recognize the tax benefits from operating additional RC facilities;
- (h) timing and amounts of or changes in future revenues, funding for our business and projects, margins, expenses, earnings, tax rate, cash flow, working capital, liquidity and other financial and accounting measures;
- (i) the materiality of any future adjustments to previously recorded revenue as a result of Department of Energy ("DOE") audits and the amount of contributions from the DOE and others towards project demonstrations;
- (j) the ability of third parties to which we lease or sell RC facilities to obtain any requested Private Letter Rulings ("PLRs") from the Internal Revenue Service ("IRS"); and
- (k) whether any legal challenges or Environmental Protection Agency ("EPA") actions will have a material impact on the implementation of the MATS or other regulations.





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We cannot guarantee that we actually will achieve the plans, intentions or expectations disclosed in our forward-looking statements and you should not place undue reliance on our forward-looking statements. Actual results or events could differ materially from the plans, intentions and expectations disclosed in the forward-looking statements we make. We have included important factors in the cautionary statements included or incorporated in this prospectus, particularly under the heading “Risk Factors” in ADA’s Annual Report on Form 10-K for the fiscal year ended December 31, 2012, as well as under the heading “Quantitative and Qualitative Disclosures About Market Risk” in such Form 10-K, under the heading “Risk Factors” in Part II Item 1A of ADA’s Quarterly Report on Form 10-Q for the quarter ended March 31, 2013, and in other reports we file with the SEC which are incorporated by reference herein that we believe could cause actual results or events to differ materially from the forward-looking statements that we make. Our forward-looking statements do not reflect the potential impact of any future acquisitions, mergers, dispositions, joint ventures or investments we may make. Any such forward-looking statements represent management’s views as of the date of the document in which such forward-looking statement is contained. While we may elect to update such forward-looking statements at some point in the future, we disclaim any obligation to do so, even if subsequent events cause our views to change, unless otherwise required by law.

### USE OF PROCEEDS

We filed the Registration Statement of which this prospectus is a part to permit the selling stockholder to resell shares of common stock it holds as described in the section entitled “Selling Stockholder.” We will not receive any proceeds from the resale of shares by the selling stockholder.

### SELLING STOCKHOLDER

The following table sets forth the number of shares beneficially owned by the selling stockholder and certain other information regarding such stockholder, as of immediately after the closing of ADA’s private placement to Arch Coal on March 23, 2010. The Vice President, Coal Technologies of the selling stockholder, Mr. Robert E. Shanklin, is a member of our Board of Directors. The appointment of Mr. Shanklin to our Board was made pursuant to a 2003 Subscription and Investment Agreement with Arch Coal whereby ADA’s management agreed to make available one seat on the Board for an Arch Coal designee and to vote all shares and proxies they are entitled to vote in favor of such designee for so long as Arch Coal continues to hold at least 100,000 shares of ADA’s (and now our) common stock. The 2003 Subscription and Investment Agreement with Arch Coal also provides Arch Coal with certain registration rights until such time as Arch Coal is free to sell the shares of common stock issued to Arch Coal under that Agreement without registration or restriction pursuant to Rule 144 promulgated under the Securities Act. The Registration Statement of which this prospectus is a part includes 118,614 shares of our common stock pursuant to those registration rights. Except for our license agreement and supply agreement with Arch Coal, there are no other material relationships with ADA or with us within the past three years other than as a result of the selling stockholder’s purchase and ownership of ADA’s and now our common stock and our obligation to maintain the registration of such common stock under specific circumstances and for specific times.

The shares offered by this prospectus may be offered from time to time by the selling stockholder. The following table assumes that the selling stockholder will sell all of the shares being offered for its account by this prospectus. However, we are unable to determine the exact number of shares that actually will be sold, if any. We do not know how long the selling stockholder will hold the shares of our common stock before selling them and we currently have no agreements, arrangements or understandings with the selling stockholder regarding the sale of any of the shares of our common stock. The information in the table below is current only as of the date of this prospectus. If the selling stockholder transfers some or all of its common stock to a pledgee, donee, transferee or other successor-in-interest, we may be required to file a prospectus supplement or a post-effective amendment to the registration statement of which this prospectus is a part.

In the following table, beneficial ownership is determined in accordance with the rules of the SEC and includes voting or investment power with respect to the shares. Except as otherwise indicated in the footnotes below, we believe that the selling stockholder named in this table has sole voting and investment power over the shares of our common stock indicated.

In determining the number of shares of our common stock beneficially owned by the selling stockholder and the percentage ownership of the selling stockholder, we include any shares as to which the selling stockholder has sole or shared voting power or investment power. The selling stockholder currently holds no shares subject to warrants, options or other convertible securities.

	Number of Shares Beneficially Owned Prior	Number of Shares Registered for	Shares Owned After Sale of Registered Shares	
	to Offering	Sale	Number	Percentage
<u>Selling Stockholder</u> Arch Coal, Inc.	262,499	262,499	0	0

**PLAN OF DISTRIBUTION**

The shares covered by this prospectus may be offered and sold from time to time by the selling stockholder. The term “selling stockholder” includes donees, pledgees, transferees or other successors-in-interest selling shares received after the date of this prospectus from the selling stockholder as a gift, pledge, distribution or other non-sale related transfer. The selling stockholder will act independently of us in making decisions with respect to the timing, manner and size of each sale. Such sales may be made on one or more exchanges or in the over-the-counter market or otherwise, at prices and under terms then prevailing or at prices related to the then current market price or in negotiated transactions. The selling stockholder may sell its shares by one or more of the following methods:

- purchases by a broker-dealer as principal and resale by such broker-dealer for its own account pursuant to this prospectus;
- ordinary brokerage transactions and transactions in which the broker solicits purchasers;
- an over-the-counter distribution in accordance with the rules of The NASDAQ Capital Market;
- in privately negotiated transactions;
- in options transactions;
- to or through underwriters;
- through dealers or agents;
- a block trade in which the broker or dealer so engaged will attempt to sell the securities as an agent but may position and resell a portion of the block as a principal to facilitate the transaction;
- through a combination of these methods; and
- by any other legally available means.

In addition, any shares that qualify for sale pursuant to Rule 144 may be sold under Rule 144 rather than pursuant to this prospectus.

To the extent required, this prospectus may be amended or supplemented from time to time to describe a specific plan of distribution. In connection with the distributions of shares or otherwise, the selling stockholder may enter into hedging transactions with broker-dealers or other financial institutions. In connection with such transactions, broker-dealers or other financial institutions may engage in short sales of the common stock in the course of hedging the positions they assume with the selling stockholder. The selling stockholder may enter into option or other transactions with broker-dealers or other financial institutions which require the delivery to such broker-dealer or other financial institution of shares offered by this prospectus, which shares such broker-dealer or other financial institution may resell pursuant to this prospectus (as supplemented or amended to reflect such transaction). The selling stockholder may also pledge shares to a broker-dealer or other financial institution, and, upon a default, such broker-dealer or other financial institution, may effect sales of the pledged shares pursuant to this prospectus (as supplemented or amended to reflect such transaction).

In effecting sales, underwriters, broker-dealers or agents engaged by the selling stockholder may arrange for other underwriters or broker-dealers to participate. Underwriters, broker-dealers or agents may receive commissions, discounts or concessions from the selling stockholder in amounts to be negotiated immediately prior to the sale. Such discounts, concessions or commissions as to particular underwriters, broker-dealers or agents may be in excess of those customary for the types of transactions involved.

In offering the shares covered by this prospectus, the selling stockholder and any broker-dealers who execute sales for the selling stockholder may be deemed to be “underwriters” within the meaning of the Securities Act in connection with such sales. Any profits realized by the selling stockholder and the compensation of any broker-dealer may be deemed to be underwriting discounts and commissions. Some of the underwriters or deemed underwriters or agents and their associates may be customers of, engage in transactions with, and perform services for us in the ordinary course of business.

In order to comply with the securities laws of certain states, if applicable, the shares must be sold in such jurisdictions only through registered or licensed brokers or dealers. In addition, in certain states the shares may not be sold unless they have been registered or qualified for sale in the applicable state or an exemption from the registration or qualification requirement is available and is complied with.

We have advised the selling stockholder that the anti-manipulation rules of Regulation M under the Securities Exchange Act of 1934, as amended, or the Exchange Act, apply to sales of shares in the market and to the activities of the selling stockholder and their affiliates. In addition, we will make copies of this prospectus available to the selling stockholder for the purpose of satisfying the prospectus delivery requirements of the Securities Act of 1933, as amended, or the Securities Act. The selling stockholder may indemnify any broker-dealer that participates in transactions involving the sale of the shares against certain liabilities, including liabilities arising under the Securities Act.

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At the time a particular offer of shares is made, if required, a prospectus supplement will be distributed that will set forth the number of shares being offered and the terms of the offering, including the name of any underwriter, dealer or agent, the purchase price paid by any underwriter, any discount, commission and other item constituting compensation, any discount, commission or concession allowed or reallocated or paid to any dealer, and the proposed selling price to the public. In compliance with guidelines of the Financial Industry Regulatory Authority, or FINRA, the maximum consideration or discount to be received by any FINRA member or independent broker dealer may not exceed 8% of the aggregate amount of the securities offered pursuant to this prospectus and any applicable prospectus supplement.

We will pay all expenses of the registration of the shares of common stock pursuant to agreements with Arch, including, without limitation, U.S. Securities and Exchange Commission filing fees and expenses of compliance with state securities or “blue sky” laws; provided, however, that the selling stockholder will pay all underwriting discounts, commissions and concessions and brokers’ or agents’ commissions and concessions or selling commissions and concessions, if any. We have agreed to indemnify the selling stockholder against certain liabilities, including certain liabilities under the Securities Act. Underwriters, dealers and agents may be entitled to indemnification by us and the selling stockholder against specific civil liabilities, including liabilities under the Securities Act or to contribution with respect to payments which the underwriters or agents may be required to make in respect thereof, under underwriting or other agreements. The terms of any such indemnification provisions will be set forth in a prospectus supplement.

We have agreed with the selling stockholder to keep the registration statement of which this prospectus constitutes a part effective with respect to the shares of common stock issued in the 2003 private placement until such time as the selling stockholder is free to sell the shares of common stock issued to Arch Coal under without registration or restriction pursuant to Rule 144 promulgated under the Securities Act, and the shares issued in the 2010 private placement until the earliest of (1) one year from its effective date (subject to certain extensions), (2) such time as all of the shares covered by this prospectus may be sold pursuant to Rule 144(b) without volume or manner of sale restrictions, (3) such time as all of the shares covered by this prospectus have been publicly sold pursuant to this prospectus or Rule 144. Notwithstanding the foregoing obligations, we may, under specified circumstances, suspend the use of the registration statement, or any amendment or supplement thereto.

### LEGAL MATTERS

The validity of the shares offered by this prospectus has been passed upon by Fortis Law Partners LLC, 1900 Wazee Street, Suite 300, Denver, Colorado 80202.

### EXPERTS

The consolidated financial statements of ADA as of and for the three fiscal years ended December 31, 2012 appearing in ADA’s Annual Reports on Form 10-K for such years have been audited by EKS&H LLLP, an independent registered public accounting firm, as set forth in their reports thereon, included therein, and incorporated herein by reference. Such consolidated financial statements are incorporated herein by reference in reliance upon such reports given on the authority of such firm as experts in accounting and auditing.

### WHERE YOU CAN FIND MORE INFORMATION

We file reports, proxy statements and other documents with the SEC. You may read and copy any document we file at the SEC’s public reference room at 100 F Street NE, Room 1580, Washington, D.C. 20549. You should call 1-800-SEC-0330 for more information on the public reference room. Our SEC filings are also available to you on the SEC’s Internet site at [www.sec.gov](http://www.sec.gov).

This prospectus is part of the Registration Statement that we filed with the SEC. The registration statement contains more information than this prospectus regarding us and our common stock, including certain exhibits and schedules. You can obtain a copy of the registration statement from the SEC at the address listed above or from the SEC’s website.

Our Common Stock is currently traded in the over-the-counter market and is quoted on the NASDAQ Capital Market. Reports, proxy statements and other information filed by the Company therewith can be inspected at the National Association of Securities Dealers, Inc. 1735 K Street NW, Washington, D.C. 20006.

### INCORPORATION OF CERTAIN DOCUMENTS BY REFERENCE

The SEC requires us to “incorporate” into this prospectus information that we file with the SEC in other documents. This means that we can disclose important information to you by referring to other documents that contain that information. The information incorporated by reference is considered to be part of this prospectus. Information contained in this prospectus and information that we file with the SEC in the future and incorporate by reference in this prospectus automatically updates and supersedes previously filed information. We incorporate by reference the documents listed below and any future filings we make with the SEC under Sections 13(a), 13(c), 14 or 15(d) of the Exchange Act after the date of this prospectus and prior to the termination of this offering.

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- ADA’s Annual Report on Form 10-K for the fiscal year ended December 31, 2012, filed with the SEC on March 18, 2013 (File No. 000-50216);
- The information specifically incorporated by reference into ADA’s Annual Report from our Definitive Proxy Statement on Schedule 14A, filed with the SEC on April 25, 2013 (File No. 000-50216);
- ADA’s Quarterly Report on Form 10-Q for the fiscal quarter ended March 31, 2013, filed with the SEC on May 10, 2013 (File No. 000-50216);
- ADA’s Current Reports on Form 8-K, filed with the SEC February 11, 2013, March 13, 2013, March 22, 2013, March 25, 2013, June 14, 2013 and July 1, 2013 (excluding information furnished under Items 2.02, 7.01, and 9.01) (File No. 000-50216);
- any other filings we make pursuant to the Exchange Act after the date of filing this amendment to the registration statement and prior to effectiveness of the registration statement; and
- The description of our common stock contained in our Registration Statement on Form S-4 filed with the SEC on March 25, 2013, as amended and declared effective by the SEC.

Notwithstanding the foregoing, unless specifically stated otherwise, none of the information that we disclose under Items 2.02, 7.01 and 9.01 of any Current Report on Form 8-K that may be listed above or that we furnish from time to time to the SEC will be incorporated by reference into, or otherwise included in, this prospectus.

You may request a copy of these documents, which will be provided to you at no cost, by writing or telephoning us using the following contact information:

Mark McKinnies  
Secretary of ADA-ES  
9135 South Ridgeline Boulevard, Suite 200,  
Highlands Ranch, Colorado 80129  
(303) 734-1727  
E-mail: mark.mckinnies@adaes.com

Exhibits to the filings will not be sent, however, unless those exhibits have specifically been incorporated by reference in this document.

## PART II INFORMATION NOT REQUIRED IN PROSPECTUS

### Item 14. Other Expenses of Issuance and Distribution.

The following table sets forth the various expenses incurred in connection with the sale and distribution of the securities registered under the Registration Statement, all of which were borne by ADA (except any underwriting discounts and commissions and expenses incurred by the selling stockholder for brokerage, accounting, tax or legal services or any other expenses incurred by the selling stockholder in disposing of the shares). All amounts shown are estimates except the SEC registration fee.

SEC registration fee	\$ 110
Legal fees and expenses	\$ 5,000
Accounting fees and expenses	\$ 3,500
Miscellaneous expenses	\$ 5,000
Total expenses	\$13,610

### Item 15. Indemnification of Directors and Officers.

Our Second Amended and Restated Certificate of Incorporation (the “ADES Certificate”) provides, to the fullest extent permitted by Delaware law, that directors will not be liable to us or our stockholders for monetary damages for breach of fiduciary duty as a director. Delaware law currently provides that this waiver may not apply to liability:

- for any breach of the director’s duty of loyalty to us or our stockholders;
- for acts or omissions not in good faith or that involve intentional misconduct or a knowing violation of law;
- under Section 174 of the Delaware General Corporation Law (“DGCL”) (governing distributions to stockholders); or
- for any transaction from which the director derived any improper personal benefit.

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If the DGCL is amended to authorize corporate action further eliminating or limiting the personal liability of directors, however, then the liability of our directors will be eliminated or limited to the fullest extent permitted by the DGCL, as so amended.

### Indemnification of Directors, Officers and Others

The DGCL allows a corporation to indemnify its directors and officers, as well as other employees and individuals, against expenses (including attorneys' fees), judgments, fines and amounts paid in settlement in connection with specified actions, suits or proceedings, whether civil, criminal, administrative or investigative (other than an action by or in the right of the corporation such as a derivative action) if the individuals acted in good faith and in a manner they reasonably believed to be in or not opposed to the best interests of the corporation and, with respect to any criminal action or proceeding, has no reasonable cause to believe their conduct was unlawful. Delaware law requires court approval before any indemnification where the person seeking indemnification has been found liable to the corporation

The ADES Certificate provides that we must, subject to certain limitations, indemnify, advance expenses, and hold harmless, to the fullest extent permitted by applicable law as it presently exists or may be amended, any person who was or is made or is threatened to be made a party or is otherwise involved in any action, suit or proceeding, whether civil, criminal, administrative or investigative, by reason of the fact that he or she, or a person for whom he or she is the legal representative, is or was a director or officer of ADES or, while a director or officer of ADES, is or was serving at the request of ADES as a director, officer, employee or agent of another business, against all liability and loss suffered and expenses (including attorneys' fees) reasonably incurred by such person.

### Item 16. Exhibits

<u>EXHIBIT NUMBER</u>	<u>DESCRIPTION</u>
4.1	Registration Rights Agreement dated March 23, 2010 (a)
4.2	Subscription and Investment Agreement dated July 7, 2003 (b)
5.1	Opinion of Fortis Law Partners LLC
23.1	Consent of EKS&H LLLP
23.2	Consent of Fortis Law Partners LLC (included in Exhibit 5.1 filed herewith)
24.1	Power of Attorney (See signature page of this Amendment No. 1 to the Registration Statement)
(a)	Incorporated by reference to Exhibit 4.1 of ADA-ES, Inc.'s Quarterly Report on Form 10-Q for the quarterly period ended March 31, 2010 (File No. 000-50216).
(b)	Incorporated by reference to Exhibit 10.6 of ADA-ES, Inc.'s Form 10SB12G/A filed with the SEC on July 28, 2003 (File No. 000-50216).

### Item 17. Undertakings.

(a) The undersigned registrant hereby undertakes:

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

(i) To include any prospectus required by Section 10(a)(3) of the Securities Act of 1933;

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

(iii) To include any material information with respect to the plan of distribution not previously disclosed in the registration statement or any material change to such information in the registration statement;

*provided, however*, that paragraphs (i), (ii) and (iii) do not apply if the information required to be included in a post-effective amendment by those paragraphs is contained in reports filed with or furnished to the Commission by the registrant pursuant to Section 13 or Section 15(d) of the Securities Exchange Act of 1934 that are incorporated by reference in the registration statement, or is contained in a form of prospectus filed pursuant to Rule 424(b) that is part of the registration statement.

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(2) That, for the purpose of determining any liability under the Securities Act of 1933, each such post-effective amendment shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial *bona fide* offering thereof.

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

(4) That, for purposes of determining liability under the Securities Act of 1933 to any purchaser:

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

(ii) Each prospectus required to be filed pursuant to Rule 424(b)(2), (b)(5) or (b)(7) as part of a registration statement in reliance on Rule 430B relating to an offering made pursuant to Rule 415(a)(1)(i), (vii) or (x) for the purpose of providing the information required by Section 10(a) of the Securities Act of 1933 shall be deemed to be part of and included in the registration statement as of the earlier of the date such form of prospectus is first used after effectiveness or the date of the first contract of sale of securities in the offering described in the prospectus. As provided in Rule 430B, for liability purposes of the issuer and any person that is at that date an underwriter, such date shall be deemed to be a new effective date of the registration statement relating to the securities in the registration statement to which that prospectus relates, and the offering of such securities at that time shall be deemed to be the initial *bona fide* offering thereof.

*Provided, however*, that no statement made in a registration statement or prospectus that is part of the registration statement or made in a document incorporated or deemed incorporated by reference into the registration statement or prospectus that is part of the registration statement will, as to a purchaser with a time of contract of sale prior to such effective date, supersede or modify any statement that was made in the registration statement or prospectus that was part of the registration statement or made in any such document immediately prior to such effective date.

(b) The undersigned registrant hereby undertakes that, for the purpose of determining any liability under the Securities Act of 1933, each filing of the registrant's annual report pursuant to Section 13(a) or Section 15(d) of the Securities Exchange Act of 1934 (and, where applicable, each filing of an employee benefit plan's annual report pursuant to Section 15(d) of the Securities Exchange Act of 1934) that is incorporated by reference in the registration statement shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial *bona fide* offering thereof.

(c) Insofar as indemnification for liabilities arising under the Securities Act of 1933 may be permitted to directors, officers and controlling persons of the registrant pursuant to the foregoing provisions, or otherwise, the registrant has been advised that in the opinion of the Securities and Exchange Commission such indemnification is against public policy as expressed in the Securities Act of 1933 and is, therefore, unenforceable. In the event that a claim for indemnification against such liabilities (other than the payment by the registrant of expenses incurred or paid by a director, officer or controlling person of the registrant in the successful defense of any action, suit or proceeding) is asserted by such director, officer or controlling person in connection with the securities being registered, the registrant will, unless in the opinion of its counsel the matter has been settled by controlling precedent, submit to a court of appropriate jurisdiction the question whether such indemnification by it is against public policy as expressed in the Securities Act of 1933 and will be governed by the final adjudication of such issue.



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**SIGNATURES**

Pursuant to the requirements of the Securities Act of 1933, as amended, the registrant certifies that it has reasonable grounds to believe that it meets all the requirements for filing of this Post-Effective Amendment No. 1 to the Registration Statement on Form S-3 and has duly caused this amendment to be signed on its behalf by the undersigned, thereunto duly authorized, in the city of Highlands Ranch, State of Colorado, on July 3, 2013.

**ADVANCED EMISSIONS SOLUTIONS, INC.**

By:           /s/ Michael D. Durham            
          Michael D. Durham  
          President and Chief Executive Officer  
          (Principal Executive Officer)

By:           /s/ Mark H. McKinnies            
          Mark H. McKinnies  
          Senior Vice President and Chief Financial Officer  
          (Principal Financial and Accounting Officer)

**SIGNATURES  
(INCLUDING POWER OF ATTORNEY)**

KNOW ALL PERSONS BY THESE PRESENTS, that each person whose signature appears below constitutes and appoints Michael D. Durham and Mark H. McKinnies, and each or any one of them, his or her true and lawful attorney-in-fact and agent, with full power of substitution and resubstitution, for him or her and in his or her name, place and stead, in any and all capacities, to sign any and all amendments to the Registration Statement (including the Post-Effective Amendment No. 1 filed herewith), and to file the same, with all exhibits thereto, and other documents in connection therewith, with the Securities and Exchange Commission, granting unto said attorneys-in-fact and agents, and each of them, full power and authority to do and perform each and every act and thing requisite and necessary to be done in connection therewith, as fully to all intents and purposes as he or she might or could do in person, hereby ratifying and confirming all that said attorneys-in-fact and agents, or any of them, or their or his substitutes or substitute, may lawfully do or cause to be done by virtue thereof.

Pursuant to the requirements of the Securities Act of 1933, as amended, this Post-Effective Amendment No. 1 to the Registration Statement on Form S-3 has been signed by the following persons in the capacities and on the dates indicated.

<u>Signature</u>	<u>Title</u>	<u>Date</u>
<u>          /s/ Michael D. Durham          </u> Michael D. Durham	President, Chief Executive Officer and Director (Principal Executive Officer)	July 3, 2013
<u>          /s/ Mark H. McKinnies          </u> Mark H. McKinnies	Senior Vice President, Chief Financial Officer and Director (Principal Financial and Accounting Officer)	July 3, 2013
<u>          /s/ Kim B. Clarke          </u> Kim B. Clarke	Director	July 3, 2013
<u>          /s/ Alan Bradley Gabbard          </u> Alan Bradley Gabbard	Director	July 3, 2013
<u>          /s/ Derek C. Johnson          </u> Derek C. Johnson	Director	July 3, 2013
<u>          /s/ W. Phillip Marcum          </u> W. Phillip Marcum	Director	July 3, 2013
<u>          /s/ Robert E. Shanklin          </u> Robert E. Shanklin	Director	July 3, 2013
<u>          /s/ Jeffrey C. Smith          </u> Jeffrey C. Smith	Director	July 3, 2013
<u>          /s/ Richard J. Swanson          </u> Richard J. Swanson	Director	July 3, 2013



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**EXHIBIT INDEX**

<b><u>EXHIBIT NUMBER</u></b>	<b><u>DESCRIPTION</u></b>
4.1	Registration Rights Agreement dated March 23, 2010 (a)
4.2	Subscription and Investment Agreement dated July 7, 2003 (b)
5.1	Opinion of Fortis Law Partners LLC
23.1	Consent of EKS&H LLLP
23.2	Consent of Fortis Law Partners LLC (included in Exhibit 5.1 filed herewith)
24.1	Power of Attorney (See signature page of this Amendment No. 1 to the Registration Statement)
(a)	Incorporated by reference to Exhibit 4.1 of ADA-ES, Inc.'s Quarterly Report on Form 10-Q for the quarterly period ended March 31, 2010 (File No. 000-50216).
(b)	Incorporated by reference to Exhibit 10.6 of ADA-ES, Inc.'s Form 10SB12G/A filed with the SEC on July 28, 2003 (File No. 000-50216).



July 3, 2013

Advanced Emissions Solutions, Inc.  
9135 South Ridgeline Boulevard, Suite 200  
Highlands Ranch, Colorado 80129

Re: Advanced Emissions Solutions, Inc.  
Registration Statement on Form S-3  
SEC File No. 333-167188

Ladies and Gentlemen:

We have acted as counsel to Advanced Emissions Solutions, Inc., a Delaware corporation (the "Company"). Pursuant to the consummation of the transactions contemplated by that certain Agreement and Plan of Merger, dated as of March 25, 2013 (the "Merger Agreement"), entered into by and among the Company, ADA-ES, Inc., a Colorado corporation ("ADA-ES"), and ADA Merger Corp., a Colorado corporation and a wholly owned subsidiary of the Company ("MergerCo"), MergerCo merged with and into ADA-ES (the "Merger"), ADA-ES became a wholly owned subsidiary of the Company with each share of common stock, no par value, of ADA-ES that was issued and outstanding at the time of the merger converted into one share of common stock, par value \$0.001, of the Company, and each share of common stock of MergerCo becoming a share of ADA-ES.

ADA-ES filed the Registration Statement on Form S-3, Securities and Exchange Commission ("SEC") File No. 333-167188, with the SEC on May 28, 2010 (the "Original Registration Statement"). ADA-ES subsequently filed Amendment No. 1 to the Original Registration Statement on August 23, 2010 (this amendment, together with the Original Registration Statement, the "Registration Statement"). The Company succeeded to the obligations of ADA-ES as a result of the Merger, and by filing Post-Effective Amendment No. 1 to the Registration Statement is expressly adopting the Registration Statement.

The Company has requested our opinion as to the legality of the 262,499 shares (the "Shares") of the Company's common stock, par value \$0.001 per share, that may be sold from time to time by the stockholder of the Company named under the caption "Selling Stockholder" in the Post-Effective Amendment No. 1 to the Registration Statement.

In connection with rendering this opinion, we have reviewed copies of the following documents relating to the Shares:

1. the Registration Statement;
2. the Second Amended and Restated Certificate of Incorporation of the Company;
3. the Bylaws of the Company;
4. the Merger Agreement;
5. Registration Rights Agreement dated March 23, 2010 by and between Arch Coal, Inc. and ADA-ES;
6. Subscription Agreement dated March 23, 2010 by and between Arch Coal, Inc. and ADA-ES;
7. documents evidencing the actions of the Board of Directors of ADA-ES relating to the authorization of the Shares and the transactions contemplated by the Registration Statement;
8. the Securities Subscription and Investment Agreement dated as of the 7<sup>th</sup> day of July 2003 between Earth Sciences, Inc., ADA-ES and Arch Coal, Inc.; and

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9. such other documents and records as we have deemed necessary to enable us to express an opinion on the matters covered hereby.

In rendering this opinion, we have: (a) assumed (i) the genuineness of all signatures on all documents reviewed by us, (ii) the authenticity of all documents submitted to us as originals and (iii) the conformity to original documents of all documents submitted to us as photostatic or conformed copies and the authenticity of the originals of such copies; and (b) relied on (i) representations, statements and certificates of public officials and others and (ii) as to matters of fact, statements, representations and certificates of officers and representatives of the Company.

Based upon the foregoing, and subject to the qualifications, assumptions and limitations stated herein, we are of the opinion that the Shares have been validly issued and are fully paid and non-assessable.

We hereby consent to the use of this opinion as an exhibit to the Post-Effective Amendment No. 1 to the Registration Statement. In giving the foregoing consent, we do not thereby admit that we are in the category of persons whose consent is required under Section 7 of the Act or the rules and regulations of the SEC thereunder.

In rendering the foregoing opinion, we express no opinion as to the laws of any jurisdiction other than to (i) the corporate laws of the State of Delaware, including all applicable statutory provisions of the Delaware General Corporation Law, all rules and regulations underlying such statutory provisions of law, and all applicable judicial and regulatory determinations concerning such laws as reported in publicly available compilations of such judicial and regulatory determinations and (ii) the federal law of the United States to the extent specifically referred to herein. All opinions expressed are as of the date hereof except where expressly stated otherwise.

Very truly yours,

/s/ Fortis Law Partners LLC  
Fortis Law Partners LLC

**CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM**

We hereby consent to the incorporation by reference in this Post-Effective Amendment No. 1 to the Registration Statement on Form S-3 of our report dated March 18, 2013, relating to the consolidated financial statements of ADA-ES, Inc. and Subsidiaries as of December 31, 2012, 2011, and 2010 and for the years then ended. We also consent to the reference to us under the heading "Experts" in this Registration Statement.

/s/ EKS&H LLLP

EKS&H LLLP

July 3, 2013  
Denver, Colorado