

SPIRE Corp
Form 11-K
July 01, 2013

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

FORM 11-K

S Annual Report Pursuant to Section 15(d) of the Securities Exchange Act of 1934
For the fiscal year ended December 31, 2012 or

o Transition Report Pursuant to Section 15(d) of the Securities Exchange Act of 1934
For the transition period from _____ to _____

Commission file number: 0-12742

A. Full title of the plan and the address of the plan, if different from that of the issuer named below:

Spire Corporation 401(k) Profit Sharing Plan

B. Name of issuer of the securities held pursuant to the plan and the address of its principal executive office:

Spire Corporation
One Patriots Park
Bedford, Massachusetts 01730-2396

Spire Corporation 401(k) Profit Sharing Plan
Financial Statements and Supplemental Schedules
As of December 31, 2012 and 2011 and for the Year Ended December 31, 2012

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Report of Independent Registered Public Accounting Firm

To the Plan Administrator and Participants of
Spire Corporation 401(k) Profit Sharing Plan
Bedford, Massachusetts

We have audited the accompanying statements of net assets available for benefits of Spire Corporation 401(k) Profit Sharing Plan (the Plan) as of December 31, 2012 and 2011, and the related statement of changes in net assets available for benefits for the year ended December 31, 2012. These financial statements are the responsibility of the Plan's management. Our responsibility is to express an opinion on these financial statements based on our audits.

We conducted our audits in accordance with the standards of the Public Company Accounting Oversight Board (United States). Those standards require that we plan and perform the audits to obtain reasonable assurance about whether the financial statements are free of material misstatement. The Plan is not required to have, nor were we engaged to perform, an audit of its internal control over financial reporting. Our audits included consideration of internal control over financial reporting as a basis for designing audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Plan's internal control over financial reporting. Accordingly, we express no such opinion. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements, assessing the accounting principles used and significant estimates made by management, and evaluating overall financial statement presentation. We believe that our audits provide a reasonable basis for opinion.

In our opinion, the financial statements referred to above present fairly, in all material respects, the net assets available for benefits of the Plan as of December 31, 2012 and 2011 and the changes in net assets available for benefits for the year ended December 31, 2012 in conformity with accounting principles generally accepted in the United States of America.

Our audits were performed for the purpose of forming an opinion on the basic financial statements taken as a whole. The accompanying supplemental schedule of assets (held at end of year) as of December 31, 2012 is presented for the purpose of additional analysis and is not a required part of the basic financial statements but is supplementary information required by the Department of Labor's Rules and Regulations for Reporting under the Employee Retirement Income Security Act of 1974. This supplemental schedule is the responsibility of the Plan's management. The supplemental schedule has been subjected to the auditing procedures applied in the audits of the basic financial statements and, in our opinion, is fairly stated in all material respects in relation to the basic financial statements taken as a whole.

/s/ Moody, Famiglietti and Andronico, LLP

MOODY, FAMIGLIETTI AND ANDRONICO, LLP
Tewksbury, Massachusetts
July 1, 2013

Spire Corporation 401(k) Profit Sharing Plan
 Statements of Net Assets Available for Benefits
 As of December 31, 2012 and 2011

| | 2012 | 2011 |
|---|-------------|-------------|
| Assets | | |
| Investments, at fair value | \$7,883,468 | \$7,496,934 |
| Receivables: | | |
| Employer contributions | — | 300 |
| Notes receivable from participants | 163,393 | 128,678 |
| Total receivables | 163,393 | 128,978 |
| Total assets | 8,046,861 | 7,625,912 |
| Liabilities | | |
| Excess contributions payable | 41,156 | 44,233 |
| Accrued expenses | 11,538 | — |
| Corrective distributions payable | 2,624 | 28,787 |
| Total liabilities | 55,318 | 73,020 |
| Net assets available for benefits, at fair value | 7,991,543 | 7,552,892 |
| Adjustments from fair value to contract value for fully benefit-responsive investment contracts | (16,645) |) — |
| Net assets available for benefits | \$7,974,898 | \$7,552,892 |

The accompanying notes are an integral part of these financial statements.

Spire Corporation 401(k) Profit Sharing Plan
 Statement of Changes in Net Assets Available for Benefits
 For the Year Ended December 31, 2012

Additions to net assets attributed to

Investment income:

| | |
|--|-----------|
| Net appreciation in fair value of investments | \$921,798 |
| Interest, dividends and other income | 169,971 |
| Interest on notes receivable from participants | 7,283 |
| Total investment income | 1,099,052 |

Contributions:

| | |
|---------------------|---------|
| Participant | 512,189 |
| Employer | 164,289 |
| Total contributions | 676,478 |

Total additions 1,775,530

Deductions from net assets

| | |
|-------------------------------|-----------|
| Benefits paid to participants | 1,341,655 |
| Administrative expenses | 11,869 |
| Total deductions | 1,353,524 |

Net increase in assets available for benefits 422,006

Net assets available for benefits at beginning of year 7,552,892

Net assets available for benefits at end of year \$7,974,898

The accompanying notes are an integral part of these financial statements.

Spire Corporation 401(k) Profit Sharing Plan
Notes to Financial Statements

1. Plan Description

The following description of the Spire Corporation 401(k) Profit Sharing Plan (the "Plan") provides only general information. Participants should refer to the Plan agreement for a more complete description of the Plan's provisions.

General

The Plan is a defined contribution plan covering all eligible employees of Spire Corporation (the "Company") and was established January 1, 1985. Effective May 1, 2012, the Plan was amended and restated using a prototype plan to include features that enable:

- Automatic enrollment of eligible employees into the Plan;
- Plan participants to designate all or a portion of their elective deferrals as Roth elective deferrals;
- Employer matching contributions to vest based on years of service at a rate of twenty-five percent per year for the first four years of vesting service; and
- Hardship distributions to be permitted from the participants' pre-tax elective deferral account, the Roth elective deferral account and the rollover account.

Capital Bank and Trust Company served as the trustee of the Plan's assets from January 1, 2012 through April 30, 2012 and individual trustees served as trustees (the "Trustee") of the Plan's assets from May 1, 2012 through December 31, 2012. The Plan is subject to the provisions of the Internal Revenue Code of 1986, as amended (the "Code"), and the provisions of the Employee Retirement Income Security Act of 1974 ("ERISA"), as amended.

Effective January 1, 2013, the Plan was amended to:

- Add a Qualified Automatic Contribution Agreement to the Plan, including a Safe Harbor matching contribution equal to the sum of 100% of a participant's elective deferrals that do not exceed 1% of the participant's compensation, plus 50% of the participant's elective deferrals that exceeds 1% of the participant's compensation but do not exceed 6% of the participant's compensation;
- Include a feature that enables partial withdrawals or installments for required minimum distributions; and
- Institute a two year vesting period for the employer's Safe Harbor contributions.

Eligibility and Contributions

Employees of the Company become eligible to participate in the Plan with voluntary contributions to their 401(k) salary deferral account upon reaching the age of 21 and upon completion of three months of service with the Company. The entry dates are the first of the month following eligibility. A participant may contribute up to the maximum amount of annual compensation allowed by the Internal Revenue Code as a pre-tax or Roth contribution. Participants can make catch-up contributions into the Plan up to the maximum amount allowed by the Internal Revenue Code. Participants may contribute rollover distributions from other qualified plans. Participants direct the investment of their contributions into various investment funds offered by the Plan. Currently, the Plan offers to participant's investments in the Company's common stock, mutual funds and a fixed annuity.

Effective on May 1, 2012, all eligible participants who were not making deferrals into the Plan were subject to automatic deferrals at a rate of 3% of compensation unless otherwise elected by the participant. The automatic deferral percentage is fixed at 3%.

The Company may contribute a discretionary matching contribution to the Plan. In 2012, the Company made matching contributions of up to 50% of the first 6% of compensation amounting to \$192,766, of which \$28,477 was allocated from the available forfeiture balance during the year.

Vesting

Participants are vested immediately in their voluntary contributions to the Plan plus actual earnings thereon. Vesting in the Company's matching contribution is based on continuous years of service, each consisting of 1,000 hours of service, and a participant vests ratably over four years of credited service for matching contribution balances on or after May 1, 2012. Prior to May 1, 2012, matching contribution balances vested ratably over five years after the first year of service. Participants become fully vested in all contributions upon death or total and permanent disability.

Participant Accounts

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Spire Corporation 401(k) Profit Sharing Plan
Notes to Financial Statements (Continued)

Each participant's account is credited with the participant's contributions and allocations of any Company's matching contribution and the Plan earnings. The benefit to which a participant is entitled is the benefit that can be provided from the participant's vested account. The participant directs the investment of his or her individual account by selecting among various mutual funds, a fixed annuity or the Company's common stock. Each participant has the ability to change the investment percentage at any time.

Forfeited Accounts

Termination of a participant who is not fully vested results in forfeiture of the non-vested portion of the participant's account balance. Forfeitures may be used to reduce future employer contributions, including matching contributions and nonelective contributions, and to pay Plan expenses. Forfeitures used to reduce employer contributions for the year ended December 31, 2011 were \$28,477. The forfeited amounts available as of December 31, 2012 and 2011 amounted to \$19,971 and \$13,536 respectively.

Notes Receivable from Participants

The Plan permits participants to borrow from their fund accounts a minimum of \$1,000 up to a maximum equal to the lesser of \$50,000 or fifty percent of their vested account balance. The loan terms range from 1 to 5 years or up to 10 years for the purchase of a primary residence. The loans are secured by the balance in the participant's account and bear interest at a rate commensurate with local prevailing rates as determined by the plan administrator. The participant may have two outstanding loans at any given time. Interest rates are fixed at prime plus one percent on the loan origination date. Principal and interest are repaid ratably through payroll deductions. The loans are administered by the trustee and are measured at the unpaid principal balance plus any accrued but unpaid interest thereon. Under certain circumstances, delinquent loans may be treated as distributions from the Plan. Notes receivable from participants outstanding were \$163,393 and \$128,678 as of December 31, 2012 and 2011, respectively. As of December 31, 2012, interest rates on loans outstanding range between 4.25% and 9.25%. Interest earned on such loans for the year ended December 31, 2012 amounted to \$7,283.

Payments of Benefits

Employees are permitted to withdraw funds from their accounts upon attaining the age of 59-1/2 if fully vested, retirement, termination, financial hardship, disability or death. The participant or beneficiary may elect to receive lump-sum cash payments or installment payments over the participant's and beneficiary's assumed life expectancy determined at the time of distribution. Benefits are recorded when paid.

Hardship Withdrawals

Hardship withdrawals are permitted by the Plan as defined in Section (k) of the Internal Revenue Code. Participants may take a hardship withdrawal from their employee pre-tax, Roth, or rollover balances, but may not take a hardship withdrawal from their Company match balances.

Plan Termination

Although management has not expressed any intent to do so, the Company has the right under the Plan to discontinue and terminate the Plan subject to the provisions of ERISA. In the event the Plan terminates, participants will become 100% vested in their accounts.

Administrative Expenses

Certain expenses of maintaining the Plan are paid directly by the Company and are excluded from these financial statements. In addition, certain distribution processing, loan administration and management fees are charged directly to the participant's account and are included in administrative expenses. Investment related expenses are charged to the forfeited account and are included in administrative expenses.

2. Summary of Significant Accounting Policies

Basis of Accounting

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Spire Corporation 401(k) Profit Sharing Plan
Notes to Financial Statements (Continued)

The financial statements of the Plan are prepared on the accrual basis of accounting in conformity with U.S. generally accepted accounting principles ("U.S. GAAP").

Recent Accounting Pronouncements

In May 2011, the Financial Accounting Standards Board ("FASB") issued Accounting Standard Update ("ASU") No. 2011-04 ("ASU 2011-04"), Amendments to Achieve Common Fair Value Measurement and Disclosure Requirements in U.S. GAAP and International Financial Reporting Standards, an amendment to FASB Accounting Standards Codification ("ASC") Topic 820, Fair Value Measurement. The update revises the application of the valuation premise of highest and best use of an asset, the application of premiums and discounts for fair value determination, as well as the required disclosures for transfers between Level 1 and Level 2 fair value measures and the highest and best use of nonfinancial assets. The update provides additional disclosures regarding Level 3 fair value measurements and clarifies certain other existing disclosure requirements. ASU 2011-04 was effective for the Plan in 2012 with early adoption prohibited. The Plan applied this guidance effective January 1, 2012 and the application of this update did not have a material impact on the Plan's financial statements.

Investment Valuation and Income Recognition

The Plan's investments are stated at fair value. Fair value is the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date.

Mutual Funds - Shares of mutual funds are valued at quoted market prices, which represent the net asset value of shares held by the Plan at year-end.

Guaranteed Investment Contract - Guaranteed investment contracts are valued at fair value by the insurance company by discounting the related cash flows based on current yields of similar instruments with comparable durations considering the creditworthiness of the issuer (see Note 5). While investment contracts held by a defined contribution plan are required to be reported at fair value, contract value is the relevant measurement attribute for that portion of the net assets available for benefits of a defined contribution plan attributable to fully benefit-responsive investment contracts. The contract value is the relevant measurement since it represents the amount that the participant would receive if they were to initiate permitted transactions under the terms of the Plan. The Statements of Net Assets Available for Benefits present the fair value of the investment contract as well as the adjustment of the fully benefit-responsive investment contract from fair value to contract value. The Statement of Changes in Net Assets Available for Benefits is prepared on a contract value basis.

Common Stock - The Company's common stock is valued at quoted market prices and held by participants in a unitized fund, whereby participants do not own shares of the Company's common stock but rather own an interest in the unitized fund. The fund consists of common stock and cash equivalents to meet the fund's daily cash needs and allows for daily trades. The value of a unit reflects the combined value of the Company's common stock and cash held by the fund. The Plan owns the underlying assets of shares in common stock and the underlying cash.

Purchases and sales of investments and realized gains and losses are accounted for on the trade date. Interest income is recorded as earned and dividend income is recorded on the ex-dividend date. The Plan reports the net appreciation or decline in the fair value of its investments consisting of realized gains or losses and unrealized appreciation or depreciation on those investments in the statement of changes in net assets available for benefits.

The methods described above may produce a fair value calculation that may not be indicative of net realizable value or reflective of future fair values. Furthermore, while the Plan believes its valuation methods are appropriate and

consistent with other market participants, the use of different methodologies or assumptions to determine fair value of certain financial instruments could result in a different fair value measurement at the reporting date.

Notes Receivable from Participants

Notes receivable from participants are measured at the unpaid principal balance plus any accrued but unpaid interest. Interest earned on notes receivable is accounted for in the statement of changes in net assets available for benefits. Related fees are recorded as administrative expenses and are expensed when they are incurred. No allowance for credit losses was recorded as of December 31, 2012 or 2011. If a participant ceases to make a note repayment and the plan administrator deems the note to be a distribution, the note balance is reduced and a benefit payment is recorded.

Spire Corporation 401(k) Profit Sharing Plan
Notes to Financial Statements (Continued)

Excess Contributions Payable

Amounts payable to participants for contributions in excess of amounts allowed under the IRS regulations are recorded as a liability in the statements of net assets available for benefits with a corresponding reduction to contributions in the statement of changes in net assets available for benefits. The Plan distributed the excess contributions to the applicable participants subsequent to the Plan year end.

Corrective Distributions Payable

Corrective distributions payable as of December 31, 2012, include amounts payable to participants for distributions of Company matching contributions that were not paid out to employees prior to the end of Plan year 2012. Corrective distributions payable as of December 31, 2011, include amounts payable to a participant for distributions that were not paid out to the employee prior to the end of Plan year 2011 as required by the Plan document upon the participant reaching age 70 1/2. The distributions are recorded as a liability in the Statements of Net Assets Available for Benefits.

Use of Estimates

The preparation of financial statements in conformity with U.S. GAAP requires management to make estimates and assumptions that affect the reported amounts of net assets, liabilities and changes in net assets in the financial statements and accompanying notes. Actual results could differ from those estimates.

Risks and Uncertainties

The Plan provides to participants various investment options consisting primarily of mutual funds, Company common stock and a fixed annuity. Mutual funds invest in securities, such as, stocks, bonds, and fixed rate income securities. Investment securities are exposed to risks including changing interest rates, market fluctuations and credit risks. Due to the level of risk associated with investment securities, it is reasonable to assume that changes in the values of the investment securities will occur and that such changes could materially affect participants' account balances and the amounts reported in the statements of net assets available for benefits.

3. Investments

Investments that represent five percent (5%) or more of the Plan's net assets available for benefits are as follows as of December 31:

| | 2012 | 2011 |
|--|--------------|-----------|
| Mutual funds: | | |
| JPMorgan SmartRetirement 2020 A | \$ 1,816,040 | \$— |
| JPMorgan SmartRetirement 2030 A | 1,291,786 | — |
| JPMorgan SmartRetirement 2025 A | 1,220,437 | — |
| JPMorgan SmartRetirement Income A | 1,009,866 | — |
| JPMorgan SmartRetirement 2015 A | 480,838 | — |
| American Funds Investment Co of America R3 | — | 1,378,662 |
| American Funds Money Market Fund R3 | — | 1,347,306 |
| American Funds Growth Fund of America R3 | — | 1,206,329 |
| American Funds Capital World Gr & Inc R3 | — | 730,144 |
| Pimco Real Return Fund R | — | 405,417 |
| American Funds 2020 Target Date Fund R3 | — | 384,941 |

During 2012, the net appreciation in fair value of the Plan's investments (including investments bought, sold, and held during the year) were as follows:

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Spire Corporation 401(k) Profit Sharing Plan
Notes to Financial Statements (Continued)

| | | |
|---|-----------|---|
| Mutual funds | \$944,192 | |
| Common Stock | (22,394 |) |
| Net appreciation in fair value of investments | \$921,798 | |

4. Fair Value Measurements

The fair value hierarchy established under Accounting Standards Codification 820-10, Fair Value Measurements and Disclosures (“ASC 820-10”) gives the highest priority to unadjusted quoted prices in active markets for identical assets or liabilities (Level 1) and the lowest priority to unobservable inputs (Level 3). As required by ASC 820-10, the Plan's financial assets are classified within the fair value hierarchy based on the lowest level of input that is significant to the fair value measurement. The three levels of the fair value hierarchy under ASC 820-10, and its applicability to the Plan's financial assets or liabilities, are described below:

Level 1 - Pricing inputs represent quoted prices available in active markets for identical investments as of the reporting date. As required by ASC 820-10, the Company does not adjust the quoted price for these investments, even in situations where the Company holds a large position and a sale could reasonably impact the quoted price.

Level 2 - Pricing inputs represent quoted prices for similar investments, or inputs that are observable, either directly or indirectly, for substantially the full term through corroboration with observable market data. Level 2 includes investments valued at quoted prices adjusted for legal or contractual restrictions specific to these investments.

Level 3 - Pricing inputs are unobservable for the investment; that is, inputs reflect the reporting entity's own assumptions about the assumptions market participants would use in pricing the asset or liability. Level 3 includes investments that are supported by little or no market activity.

Fair value is a market-based measure considered from the perspective of a market participant who would buy the asset or assume the liability rather than the Plan's own specific measure. In periods of market inactivity, the observability of prices and inputs may be reduced for certain instruments. This condition could cause an instrument to be reclassified from Level 1 to Level 2 or from Level 2 to Level 3. During the twelve months ended December 31, 2012 and 2011, none of the Plan's instruments were reclassified between Level 1, Level 2 or Level 3.

The following tables summarizes the Plan's fair value hierarchy for its financial assets measured at fair value on a recurring basis as of December 31, 2012 and 2011:

| | Balance as of December 31, 2012 | | | |
|----------------------------------|---------------------------------|--|----------|-----------|
| | Total Fair Value | Fair Value Measurements Using Input Type | | |
| | | Level 1 | Level 2 | Level 3 |
| Mutual Funds: | | | | |
| Target retirement date funds | \$6,435,720 | \$6,435,720 | \$— | \$— |
| Bond funds | 401,034 | 401,034 | — | — |
| Large cap funds | 304,135 | 304,135 | — | — |
| International funds | 210,863 | 210,863 | — | — |
| Small cap funds | 105,837 | 105,837 | — | — |
| Mid cap funds | 63,497 | 63,497 | — | — |
| Guaranteed investment contract | 281,847 | — | — | 281,847 |
| Common Stock - Spire Corporation | 80,535 | — | 80,535 | — |
| Total investments, at fair value | \$7,883,468 | \$7,521,086 | \$80,535 | \$281,847 |

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Spire Corporation 401(k) Profit Sharing Plan
Notes to Financial Statements (Continued)

| | Balance as of December 31, 2011 | | | |
|----------------------------------|---------------------------------|--|-----------|---------|
| | Total Fair Value | Fair Value Measurements Using Input Type | | |
| | | Level 1 | Level 2 | Level 3 |
| Mutual Funds: | | | | |
| Growth and income funds | \$2,222,952 | \$2,222,952 | \$— | \$— |
| Growth funds | 2,067,233 | 2,067,233 | — | — |
| Bond funds | 939,801 | 939,801 | — | — |
| Growth, income and bond funds | 807,937 | 807,937 | — | — |
| Money Market Fund | 1,347,991 | 1,347,991 | — | — |
| Common Stock - Spire Corporation | 111,020 | — | 111,020 | — |
| Total investments, at fair value | \$7,496,934 | \$7,385,914 | \$111,020 | \$— |

The following table summarizes changes in fair value of the Plan's Level 3 assets for the years ended December 31, 2012 and 2011:

| | 2012 | 2011 |
|---|-----------|------|
| Balance, beginning of year | \$— | \$— |
| Purchases | 272,633 | — |
| Unrealized gains relating to investments still held at the reporting date | 16,645 | — |
| Interest credited | 2,095 | — |
| Sales | (9,520) |) — |
| Fees | (6) |) — |
| Balance, end of year | \$281,847 | \$— |

The amount of total gains for the period attributable to the change in unrealized gains relating to assets still held at the reporting date

| | | |
|--|----------|-----|
| | \$16,645 | \$— |
|--|----------|-----|

Unrealized gains from the guaranteed investment contract are not included in the Statement of Changes in Net Assets Available for Benefits as the contract is recorded at contract value for purposes of the net assets available for benefits at the reporting date.

Effective May 1, 2012, the Guaranteed Investment Contract serves as the fixed income investment option, through which all of the Plan's cash transfers flow, including the transfer of \$7,564,457 of cash from Capital Bank and Trust.

The following table represents the Plan's Level 3 financial assets, the valuation techniques used to measure the fair value of those financial assets and the significant unobservable inputs and the ranges of values for those inputs.

| Financial Asset | Fair Value | Principal Valuation Technique | Unobservable Inputs | Significant Input Values | Weighted Average |
|--------------------------------|------------|-------------------------------|--|--------------------------|------------------|
| Guaranteed investment contract | \$281,847 | Discounted cash flow | Swap yield rates Duration Payout percentage | .98% 5 years 1.45% | Yes |

5. Guaranteed Investment Contract

In 2012, the Plan entered into a fully benefit-responsive investment contract with Great-West Life & Annuity Insurance Company "Great-West". Great-West maintains the contributions in a general account. The account is credited with earnings on the underlying investments and charged for participant withdrawals and administrative expenses. The contract is included in the financial statements at contract value as reported to the Plan by Great-West. Contract value represents contributions made under the contract, plus earnings, less participant withdrawals and administrative expenses. Participants may ordinarily direct the withdrawal or

transfer of all or a portion of their investment at contract value. The guaranteed investment contract issuer is contractually obligated to repay the principal and a specified interest rate that is guaranteed to the Plan.

As described in Note 3, because the guaranteed investment contract is fully benefit-responsive, contract value is the relevant measurement attribute for that portion of the net assets available for benefits attributable to the guaranteed investment contract. There are no reserves against contract value for credit risk of the contract issuer or otherwise. The fair value of the investment contract was \$281,847 as of December 31, 2012. The average crediting interest rate is based on the earnings of the underlying assets in the entire medium-long term new portfolio compared to the minimum interest crediting rate, as stated in the contract, and prevailing market conditions. The interest crediting rate is reset quarterly. The guaranteed investment contract does not allow the crediting interest rate below zero percent. Certain events limit the ability of the Plan to transact at contract value with the issuer. Such events include the following: (1) amendments to the Plan documents (including complete or partial Plan termination or merger with another plan), (2) changes to the Plan's prohibition on competing investment options or deletion of equity wash provisions, (3) bankruptcy of the Plan sponsor or other Plan sponsor events (for example, divestitures or spin-offs of a subsidiary) that cause a significant withdrawal from the Plan, or (4) the failure of the trust to qualify for exemption from federal income taxes or any required prohibited transaction exemption under ERISA. The Plan administrator does not believe that any events which would limit the Plan's ability to transact at contract value with participants are probable of occurring.

The guaranteed investment contract does not permit the insurance company to terminate the agreement unless the Plan is not in compliance with the investment agreement.

| | 2012 | |
|---|------|---|
| Average Yields: | | |
| Based on actual earnings | 1.45 | % |
| Based on interest rate credited to participants | 1.45 | % |

6. Income Tax Status

The Plan adopted a prototype plan on May 1, 2012. The prototype plan received a letter from the Internal Revenue Service (the "IRS") dated March 31, 2008 that indicated the plan and related trust are designed in accordance with the applicable sections of the Internal Revenue Code (the "Code"). Prior to adopting the prototype plan, the Plan had received a determination letter dated May 23, 1995 from the IRS that the Plan and related trust were designed in compliance with the applicable requirements of the Code. Although the Plan has been amended since receiving the March 31, 2008 letter, the plan administrator believes that the Plan is designed and is currently being operated in compliance with the applicable requirements of the Code. Therefore, no provision for income taxes has been included in the Plan's financial statements.

U.S. GAAP requires the Plan to assess the recording of uncertain tax positions by evaluating the minimum recognition threshold and measurement requirements a tax position must meet before being recognized as a benefit in the financial statements. As of December 31, 2012 and 2011, the Plan has not recognized any liabilities for uncertain tax positions or unrecognized benefits. The Plan does not expect any material change in uncertain tax benefits within the next twelve months. The Plan is subject to routine audits by taxing jurisdictions; however, there are currently no audits for any tax periods in progress. The plan administrator believes the Plan is no longer subject to income tax examinations for years prior to 2009.

7. Excess Contributions

Contributions received from participants for the years ended December 31, 2012 and 2011 include \$41,156 and \$44,233, respectively, of excess contributions (net of corresponding gains and losses) that were remitted to certain active participants. The excess contributions are included in the Plan's statement of net assets available for benefits as excess contributions payable. The excess deferral contributions, originally deducted in the year ended December 31,

2012 and 2011, were subsequently returned to comply with the participants' applicable maximum annual contributions permitted under the Code.

8. Party-In-Interest Transactions

Great-West Trust Company, LLC is the custodian of the Plan's assets. Certain participant investments are in Great-West Life & Annuity Insurance Company investment vehicles, which are managed by Great-West Trust Company, LLC and these transactions are considered as party-in-interest transactions. Certain participant investments are in common stock of the Company and these transactions are considered as party-in-interest transactions.

Participant loans granted in accordance with the Plan are secured by the balances in the participants' accounts. These transactions are considered as party-in-interest transactions.

Administrative fees incurred by the Plan and paid to the custodians for the year ended December 31, 2012 amounted to \$331 and are considered as party-in-interest transactions.

9. Reconciliation of Financial Statements to Form 5500

The following is a reconciliation of the net assets available for benefits per the financial statements to the corresponding amounts shown in the Plan's Form 5500 as of December 31:

| | 2012 | 2011 |
|--|--------------|--------------|
| Net assets available for benefits per the financial statements | \$ 7,974,898 | \$ 7,552,892 |
| (Less) contributions receivable | — | (300) |
| Excess contributions payable | 41,156 | 44,233 |
| Administrative fees payable | 11,538 | — |
| Distributions payable | 2,624 | 28,787 |
| Net assets available for benefits per the Form 5500 | \$ 8,030,216 | \$ 7,625,612 |

The following is a reconciliation of the net increase in assets available for benefits per the financial statements to the net income shown in the Plan's Form 5500 for the year ended December 31, 2012:

| | |
|--|------------|
| Net increase in assets available for benefits per the financial statements | \$ 422,006 |
| (Less) prior year excess contributions payable | (44,233) |
| Current year excess contributions payable | 41,156 |
| Current year administrative fees payable | 11,538 |
| (Less) prior year corrective distributions payable | (28,787) |
| Current year corrective distributions payable | 2,624 |
| Prior year contributions receivable | 300 |
| Net income per the Form 5500 | \$ 404,604 |

10. Subsequent Events

The Plan evaluated subsequent events through the date of this filing. Except as disclosed below, there were no other subsequent events to report.

Effective January 1, 2013, the Plan was amended to:

Add a Qualified Automatic Contribution Agreement to the Plan, including a Safe Harbor matching contribution equal to the sum of 100% of a participant's elective deferrals that do not exceed 1% of the participant's compensation, plus 50% of the participant's elective deferrals that exceeds 1% of the participant's compensation but do not exceed 6% of the participant's compensation;

Include a feature that enables partial withdrawals or installments for required minimum distributions; and

Institute a two year vesting period for the employer's Safe Harbor contributions.

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Spire Corporation 401(k) Profit Sharing Plan
 EIN 04-2457335, Plan Number 002
 Schedule H, Line 4i - Schedule of Assets (Held at End of Year)
 December 31, 2012

| (a) Identity of Issue, Borrower, Lessor or Similar Party | (c) Description of Investment Including Maturity Date, Rate of Interest, Collateral, Par or Maturity Value | (e) Current Value |
|--|--|-------------------|
| JPMorgan | SmartRetirement 2020 A | \$ 1,816,040 |
| JPMorgan | SmartRetirement 2030 A | 1,291,786 |
| JPMorgan | SmartRetirement 2025 A | 1,220,437 |
| JPMorgan | SmartRetirement Income A | 1,009,866 |
| JPMorgan | SmartRetirement 2015 A | 480,838 |
| JPMorgan | SmartRetirement 2035 A | 280,201 |
| * Great-West | Key Guaranteed Portfolio Fund (at contract value) | 265,202 |
| JPMorgan | SmartRetirement 2040 A | 168,035 |
| Wells Fargo | Advantage Growth A | 164,850 |
| American Funds | Capital World G/I R4 | 107,752 |
| JPMorgan | SmartRetirement 2010 A | 99,449 |
| Dodge & Cox | Income | 85,734 |
| Franklin | US Government Securities Fund | 85,216 |
| * Spire Corporation Employer Stock | 160,749 shares of common stock | 80,535 |
| PIMCO | Real Return Admin | 67,976 |
| Vanguard | Total Bond Market Index | 55,974 |
| Virtus | Real Estate Securities A | 52,300 |
| Columbia | Dividend Income A | 48,020 |
| JPMorgan | SmartRetirement 2045 A | 47,949 |
| Fidelity | Advisor New Insights A | 45,899 |
| Victory | Fund for Income R | 44,489 |
| Loomis Sayles | Bond Fund Admin | 43,349 |
| AllianceBern | Small Cap Growth Adv | 42,497 |
| Vanguard | Small Cap Index Fund | 39,895 |
| MFS | International New Discovery R4 | 38,422 |
| Oppenheimer | Developing Markets A | 36,231 |
| American Funds | Fundamental Investors R4 | 35,081 |
| American Funds | EuroPacific Gr R4 | 25,305 |
| JPMorgan | SmartRetirement 2050 A | 21,119 |
| JPMorgan | High Yield Select | 18,296 |
| Neuberger Berman | Genesis Trust Fund | 17,822 |
| Vanguard | 500 Index Investor | 7,505 |
| Principal | MixCap Blend R4 | 6,566 |
| Victory | Small Company Opportunity R | 5,623 |
| Oppenheimer | International Growth A | 3,153 |
| MFS | Value A | 2,340 |
| Ivy | Mid Cap Growth Y | 1,954 |

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| | | |
|---------------------|------------------------------|--------------|
| Baron | Opportunity Retail | 1,449 |
| Columbia | Mid Cap Index Fund Z | 769 |
| Victory | Established Value Fund - R | 459 |
| Neuberger Berman | Socially Resp A | 440 |
| Total investments | | \$ 7,866,823 |
| * Participant loans | Interest Rates 4.25% - 9.25% | \$ 163,393 |

* Represents party-in-interest

Column (d), cost, has been omitted, as all investments are participant directed.

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SIGNATURE

Pursuant to the requirements of the Securities Exchange Act of 1934, the Investment Committee of the Spire Corporation 401(k) Profit Sharing Plan have duly caused this annual report to be signed on their behalf by the undersigned hereunto duly authorized.

Spire Corporation 401(k) Profit Sharing Plan

Date: July 1, 2013

By: /s/ Robert S. Lieberman
Robert S. Lieberman
Chief Financial Officer and Treasurer

INDEX TO EXHIBITS

| Exhibit Number | Description |
|-------------------|--|
| 23.1 | Consent of Independent Registered Public Accounting Firm (Moody, Famiglietti and Andronico, LLP) |