

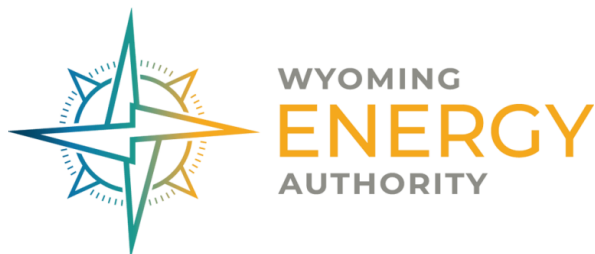


**State of Wyoming
Energy Matching Funds**

Final Executive Summary

Blue Spruce Operating LLC

Project Title: "Dry Piney Helium & Carbon Sequestration Project"



March 6, 2026

1. Executive Overview

The Dry Piney Helium & Carbon Sequestration Project is a unique infrastructure project located in western Wyoming on the LaBarge Anticline in the Greater Green River Basin. The project is designed to produce commercial quantities of helium and natural gas while permanently sequestering millions of metric tons of carbon dioxide. Blue Spruce Operating LLC (“Blue Spruce” or “BSO”) is the project operator and received funding from the Wyoming Energy Authority (“WEA”) under the State of Wyoming’s Energy Matching Funds Program to advance the characterization and engineering work described in this report.

Wyoming’s Energy Matching Funds Program was created to drive data, technology, and infrastructure investments in energy projects that strengthen Wyoming’s long-term economic competitiveness. The Dry Piney Project aligns directly with these aims by advancing the state’s role as a domestic supplier of helium—a critical material with limited substitutes—while simultaneously demonstrating that Wyoming’s deep geologic formations can permanently store world-class volumes of CO₂.

With WEA support, Blue Spruce drilled and evaluated two deep appraisal wells, acquired extensive subsurface datasets, updated reservoir simulation models, evaluated innovative gas processing technologies, and conducted front-end engineering on a corrosion-resistant gas gathering system. The results confirm the technical and commercial viability of the project and have directly informed the development plan that Blue Spruce is advancing toward a final investment decision.

Once operational, the Dry Piney Project is expected to produce more than 800 million cubic feet per year of helium—representing over ten percent of the current global helium market—and permanently sequester approximately 4.9 million metric tons per year of CO₂, an amount roughly 1.6 times the annual emissions of the Dry Fork Power Station. The plant will also produce and sell substantial volumes of pipeline-quality natural gas over the life of the project.

2. Introduction

The Dry Piney Project is located near the communities of Big Piney and LaBarge in Sublette County, Wyoming. The project area sits atop one of the largest conventional geologic structures in North America—the LaBarge Anticline on the northern Moxa Arch. Blue Spruce plans to construct a large-scale natural gas processing facility to separate helium and methane from a raw gas stream that also contains significant concentrations of carbon dioxide and hydrogen sulfide. The CO₂ and H₂S waste stream will be permanently sequestered via injection into deep geologic formations.

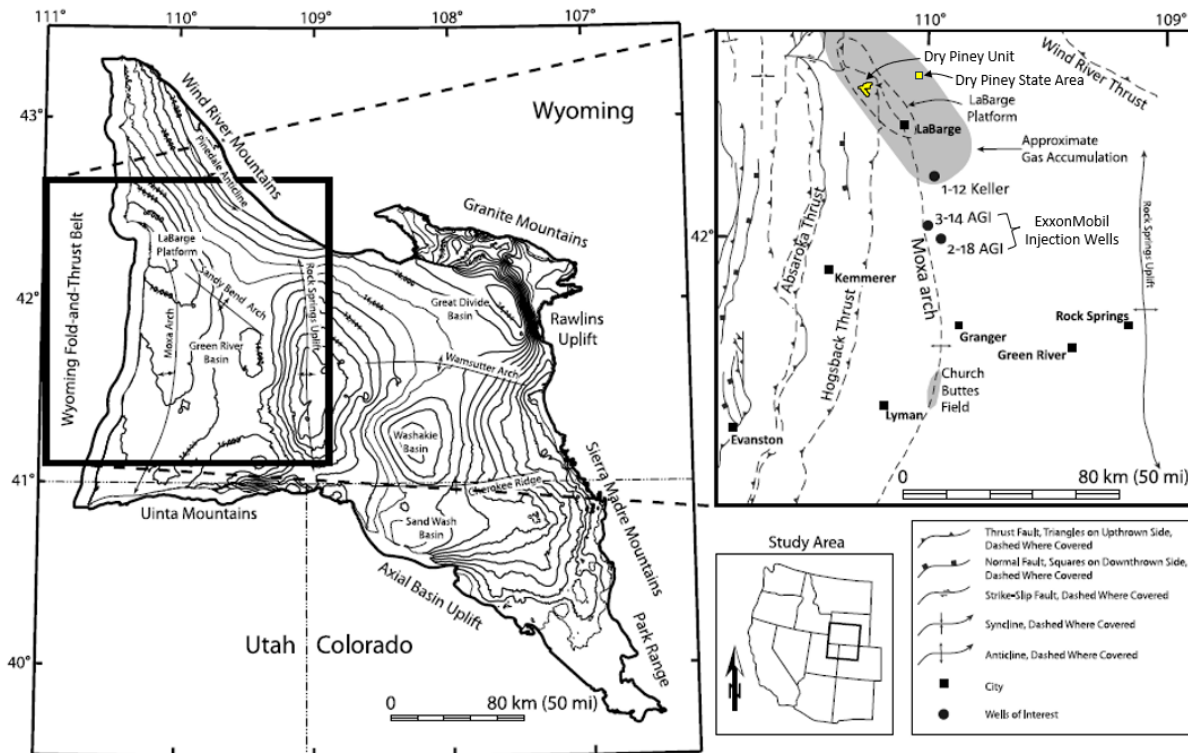


Figure 1 – Modified from Beck and Lynds, 2012. Regional map of the Greater Green River Basin showing relative position of the LaBarge Platform area on the northern end of the Moxa Arch. Smaller inset map in upper right of panel shows the location of the Blue Spruce Dry Piney Unit production area and the Dry Piney State Area for injection.

The LaBarge Anticline has been developed for oil and gas production since the mid-twentieth century. The deep Madison Formation, which is Blue Spruce’s primary production target, has been penetrated by fewer than fifty wells across the structure despite the formation’s vast areal extent of more than 800

square miles. The even deeper Bighorn Formation, a promising target for carbon storage, had been penetrated by only eight wells prior to Blue Spruce’s drilling program. This under-exploration, particularly of the Bighorn, represented a significant data gap and a key motivation for the WEA-funded work described in this report.

The LaBarge area contains two distinct petroleum systems separated by a major confining layer in the Triassic interval: a shallow sweet-gas system and a deep sour-gas system. The deep sour-gas system contains the helium, methane, CO₂, H₂S, and nitrogen that Blue Spruce intends to produce and separate. The presence of helium—the smallest molecule in nature—at great depth confirms the integrity of the overlying seal, which is also effective at trapping larger molecules such as CO₂. This natural geologic seal is a fundamental element supporting the long-term permanence of carbon sequestration in these formations.

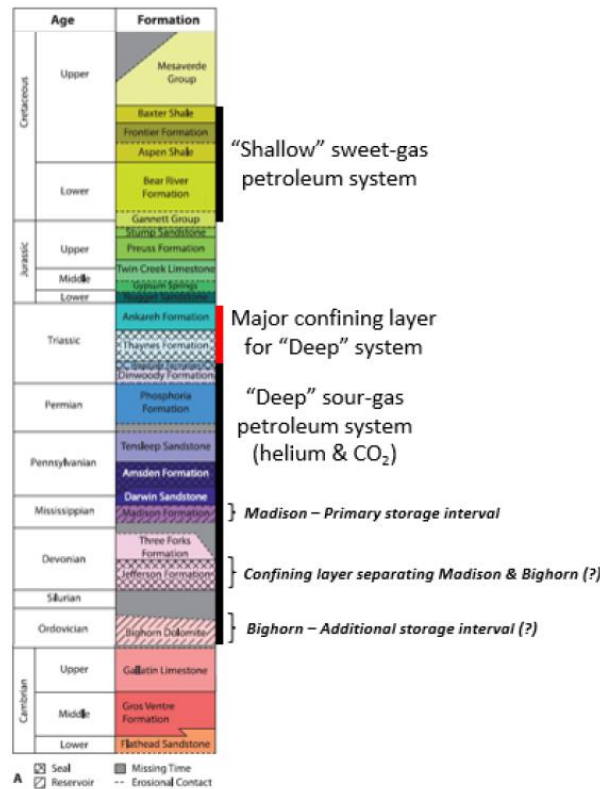


Figure 2 – Modified from Becker and Lynds, 2012. General stratigraphic column showing “shallow” and “deep” petroleum systems with major Triassic confining layer interval (red vertical bar) separating the two

distinct petroleum systems. Relative positions of the Madison Formation overlying the deeper Bighorn Formation, separated by the Darby (Jefferson) Formation, is also noted.

ExxonMobil has operated acid gas injection wells in the Madison Formation on the southern end of the Moxa Arch since 2004, providing important precedent for CO₂ sequestration in the region. However, the area closer to the structural crest—where the Dry Piney Project is located—and the deeper Bighorn Formation remained largely uncharacterized prior to Blue Spruce’s work.

3. Project Objectives

The WEA-funded scope of work was organized around three primary objectives:

Reservoir Characterization and Carbon Sequestration Potential. Evaluate the Bighorn Formation as a CO₂ storage reservoir by drilling two appraisal wells deeper than originally planned to fully penetrate the Bighorn, acquiring comprehensive wireline logging and sampling data, calibrating three-dimensional seismic data through inversion techniques, and updating reservoir simulation models to forecast production and injection performance over the project life.

Gas Processing Technology Evaluation. Evaluate alternative acid gas separation technologies—specifically Pressure Swing Adsorption as a replacement for traditional chemical solvent systems—to reduce capital costs, long-term operating expenses, and the environmental footprint of the gas processing facility.

Gas Gathering System Design. Conduct front-end engineering on the raw gas gathering pipeline system with a focus on corrosion-resistant materials that can withstand the highly corrosive gas composition while reducing long-term maintenance and improving pipeline integrity and safety.

Each of these objectives was designed to produce technical data and engineering conclusions that are directly applicable to Wyoming’s broader energy and carbon management infrastructure, in addition to advancing the Dry Piney Project toward commercial development.

4. Approach and Methods

4.1 Drilling and Subsurface Data Acquisition

Blue Spruce drilled two appraisal wells during the project period: the Dry Piney 4-36 (a production well, drilled September–December 2024) and the Dry Piney State 12-16 (a disposal well, drilled April–June 2025). Both wells were drilled through the Madison Formation and continued deeper through the Darby confining layer and into the Bighorn Formation—significantly beyond the depths that would have been required for the base development plan—in order to fully characterize the Bighorn as a potential carbon storage reservoir.

Importantly, both wells are designed to serve as functional operational wells in the future development, not as “throw-away” stratigraphic tests. The production well will be completed as a Madison gas producer, and the disposal well will be completed for acid gas injection, meaning the incremental cost of deepening these wells for Bighorn evaluation generated enduring value.

Each well underwent an extensive four-run wireline logging program across the entire open-hole production interval, acquiring foundational data (gamma ray, porosity, resistivity, density) and advanced suites (cross-dipole sonic, resistivity-based imaging, nuclear magnetic resonance, and reservoir pressure and fluid sampling). Blue Spruce also collected over one hundred large-format rotary sidewall core samples across the two wells for laboratory analysis including routine core measurements of porosity, permeability, and fluid saturation. Gas samples were collected in-situ for full compositional analysis.

This dataset—among the most comprehensive ever assembled for the deep Paleozoic section of the LaBarge Anticline—was integrated with existing publicly available well data and reprocessed three-dimensional seismic data to update the structural, stratigraphic, and petrophysical understanding of the project area.

4.2 Reservoir Modeling and Simulation

Blue Spruce constructed an updated static geocellular model incorporating the new well data, regional well tops, and a seismic acoustic impedance inversion. The inversion technique correlates seismic data to rock properties measured in wells, enabling estimation of porosity and permeability in the areas between wells where only seismic data exists. This model covers a broad area of the LaBarge structure encompassing both Blue Spruce's acreage and adjacent operators' historical production.

The static model was imported into dynamic simulation software to generate production and injection forecasts under the current development plan. The simulation was calibrated against decades of historical production and injection data from offset operators and validated against reservoir pressure measurements acquired in the two new Blue Spruce wells. Multiple injection scenarios were evaluated to optimize the number and configuration of disposal wells.

4.3 Gas Processing Technology Evaluation

Blue Spruce's gas processing plant design uses a two-step approach to acid gas separation. The first step employs mechanical refrigeration and fractionation—well-established physical separation processes—to remove the bulk of the CO₂ and H₂S from the raw gas. The second step addresses the remaining acid gas concentrations before the gas enters downstream helium and methane recovery systems.

For the second step, Blue Spruce evaluated Pressure Swing Adsorption (PSA) as an alternative to the chemical solvent-based systems (such as amine, methanol, or Selexol) that are traditionally used in other Wyoming gas plants. PSA is a physical adsorption process in which acid gas components are selectively captured on the surface of solid adsorbent materials packed in pressure vessels, then released during a depressurization cycle for recovery and sequestration. The evaluation compared PSA against solvent alternatives across technical performance, capital and operating costs, environmental impact, and long-term operational reliability.

4.4 Gas Gathering Pipeline Engineering

The raw gas gathering system presents a significant engineering challenge due to the corrosive nature of the gas composition, which contains saturated water, elevated CO₂, and H₂S. These components can combine to form sulfuric and carbonic acids that are highly corrosive to conventional carbon steel piping. Blue Spruce conducted a front-end engineering design study comparing three corrosion protection approaches: corrosion-resistant alloy (CRA) clad carbon steel pipe, internal epoxy coatings, and solid CRA pipe. Each approach was evaluated on corrosion resistance, field installation requirements, capital cost, manufacturing lead time, and long-term operations and maintenance.

5. Results and Key Findings

5.1 Reservoir Characterization

The drilling and data acquisition program produced several significant findings that have improved the understanding of both the Madison and Bighorn Formations in the project area and across the broader LaBarge structure:

The LaBarge structure is larger than previously mapped. In the disposal area, the top of the Madison Formation was encountered at a depth substantially shallower than pre-drill estimates, indicating that the overall geologic structure is larger than previously known. A larger structure implies greater potential pore volume and, by extension, greater CO₂ storage capacity.

The Bighorn Formation shows favorable reservoir properties for sequestration. Data acquired in both wells confirms that the Bighorn possesses adequate porosity, permeability, and thickness to serve as an effective CO₂ storage reservoir. In the disposal area, the high-quality porous interval within the Bighorn was thicker than anticipated with better-than-expected reservoir properties. This is a particularly important finding because the Bighorn had been largely uncharacterized in this area prior to Blue Spruce's work.

The Darby Formation provides an effective confining layer. Data from both wells confirms the Darby Formation, which separates the Madison and Bighorn, functions as a confining unit. This supports the interpretation that the Madison and Bighorn can operate as distinct storage zones, potentially allowing independent injection strategies into each formation.

Gas composition data provides critical insight. Gas samples collected at various depths reveal compositional trends that are important for understanding reservoir connectivity, planning injection operations, and calibrating simulation models. The data confirms that the deep formations contain significant in-situ CO₂ concentrations, which has implications for how injection plumes are monitored over time.

5.2 Reservoir Simulation and Forecasting

The updated reservoir simulation model, calibrated against historical performance and validated with new well data, supports the following conclusions:

Production deliverability is confirmed. The Madison Formation has sufficient capacity to support the proposed gas plant inlet rates with the planned number of production wells for a project life of at least fifty years when appropriate compression infrastructure is utilized.

Disposal capacity is adequate. The combined Madison and Bighorn Formations can accommodate the full acid gas injection requirement through the designated disposal wells. Modeling results indicate that utilizing two Bighorn injection wells—compared to zero in the original development plan—provides the most robust long-term injection performance.

The injection plume is manageable. Plume modeling indicates that the injected acid gas will remain within a manageable area over the project life with no expected interference with production operations. Blue Spruce has incorporated tracer-based monitoring into its simulation methodology to reliably distinguish injected CO₂ from naturally occurring CO₂ in the reservoir.

Development plan has been optimized. Based on the simulation results, Blue Spruce has revised its base development plan to include dedicated Bighorn injection wells. This represents a direct and significant outcome of the WEA-funded work, as it materially increases the available CO₂ storage capacity and improves the long-term operational profile of the project.

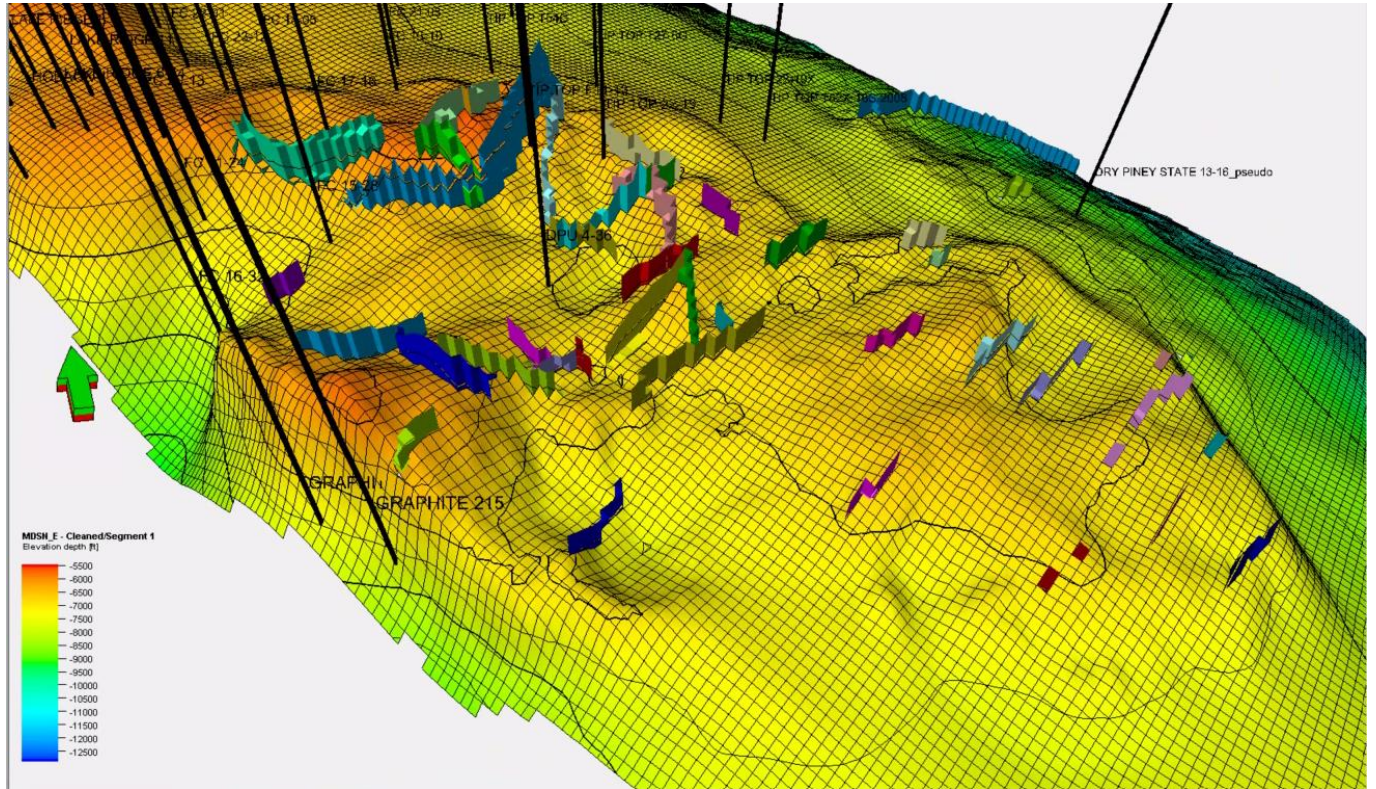


Figure 3 – Map showing grid cells on an intra-formational surface within the Madison Formation, as well as the forty-two near vertical faults in the static reservoir model.

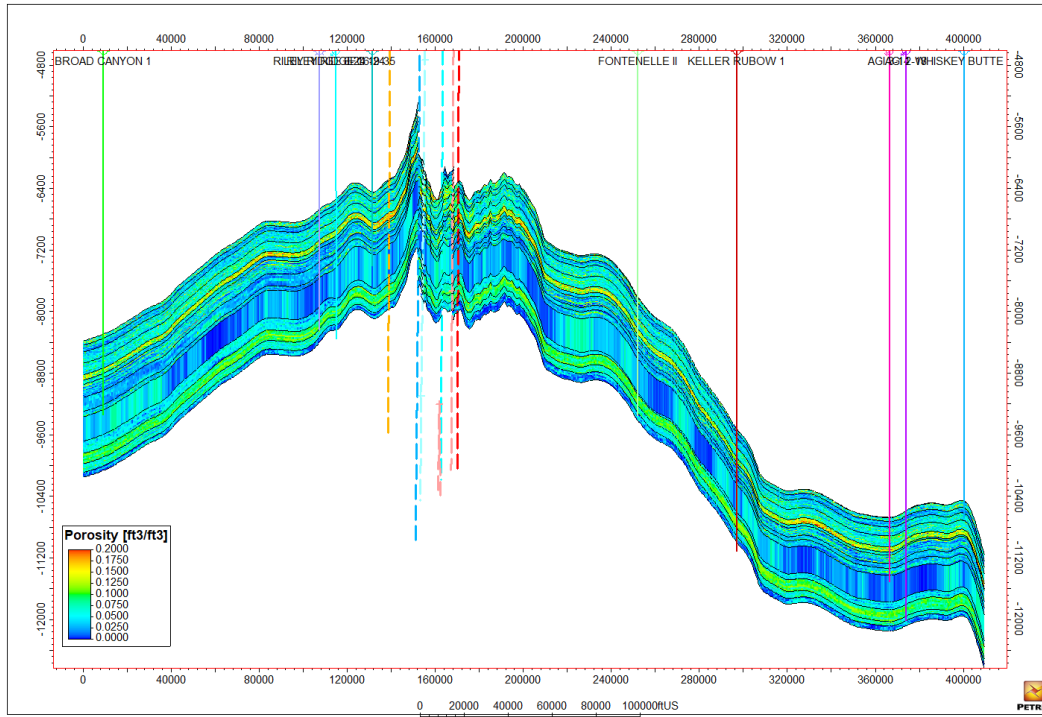


Figure 4 – Cross-section (North to South) showing the porosity property in Blue Spruce static reservoir model.

5.3 Gas Processing Technology

Blue Spruce’s evaluation demonstrated that Pressure Swing Adsorption is a technically viable alternative to chemical solvent systems for secondary acid gas removal in the Dry Piney plant design. The key advantages identified include:

PSA eliminates the need for hazardous chemical solvents, removing the associated risks of chemical storage, handling, spills, and potential operator exposure. The process does not produce solvent-contaminated waste streams and has lower emissions than solvent-based systems, which require heat for regeneration. PSA systems have minimal moving parts, resulting in high reliability and reduced maintenance requirements. The adsorbent beds used in PSA have an operational life of up to fifteen years, compared to solvent systems that require continuous monitoring, replenishment, and quality management. PSA is applicable to a range of acid gas concentrations and can be more readily adapted for CO₂ capture

and sequestration than solvent-based systems, which would require significant equipment modifications for retrofit.

Blue Spruce's gas plant design integrates PSA as the secondary acid gas removal step downstream of a bulk refrigeration and fractionation system. This integrated approach leverages mature, proven physical separation technologies in both steps and avoids reliance on chemical processes entirely. The evaluation confirmed that this design functions effectively within the overall plant heat and material balance.

5.4 Gas Gathering Pipeline Design

The front-end engineering study compared three pipeline corrosion protection approaches across five evaluation criteria: corrosion resistance, field installation complexity, capital cost, manufacturing lead time, and operations and maintenance requirements.

Corrosion-resistant alloy solutions—both clad pipe and solid CRA pipe—offer excellent corrosion protection with minimal ongoing maintenance. However, they carry substantially higher capital costs and longer procurement timelines. Internal epoxy coatings offer the most cost-effective solution with the shortest lead times, but involve greater field installation complexity and have a finite coating lifespan that will eventually require maintenance or replacement.

The study identified that the specific gas composition at Dry Piney, with its elevated H₂S content, favors certain alloy compositions over others for corrosion resistance. This finding informed the selection of materials best suited to the reducing (rather than oxidizing) corrosion environment present in the raw gas stream.

Blue Spruce is continuing to evaluate the most promising options through additional laboratory testing to validate material performance under Dry Piney-specific conditions. Results from this ongoing testing are expected in 2026 and will inform the final material selection for the gathering system.

6. Relevance and Impact to Wyoming

The Dry Piney Project advances several strategic priorities for the State of Wyoming and demonstrates the value of the Energy Matching Funds Program in catalyzing private-sector energy development:

Strengthening Domestic Helium Supply. The United States faces declining domestic helium production as the federal helium reserve has been drawn down and existing sources age. Without new domestic supply, the country will become increasingly reliant on imports from geopolitically concentrated sources. The Dry Piney Project, once operational, will represent one of the largest new sources of domestic helium production and will help maintain Wyoming’s position as a leading helium-producing state. Helium is essential to industries including healthcare (MRI systems), semiconductor manufacturing, aerospace, and scientific research.

Advancing Carbon Sequestration in Wyoming. This project has produced one of the most comprehensive datasets ever assembled for the deep Paleozoic formations of the LaBarge Anticline, with particular focus on the previously under-characterized Bighorn Formation. The confirmation that the Bighorn possesses favorable reservoir properties for CO₂ storage—and the associated finding that the LaBarge structure is larger than previously mapped—has significant implications beyond the Dry Piney Project. These findings contribute to the growing body of evidence that western Wyoming’s deep geologic formations represent a world-class carbon storage resource that could accommodate CO₂ volumes from industrial emitters across the region, including those along the Interstate 80 corridor.

Demonstrating Innovative Gas Processing Technology. The successful technical evaluation of Pressure Swing Adsorption as an alternative to chemical solvent systems has applicability beyond the Dry Piney Project. As Wyoming’s CCUS infrastructure grows, operators throughout the state could benefit from gas processing technologies that reduce capital costs, lower emissions, improve worker safety, and simplify long-term operations. Blue Spruce’s work establishes a technical foundation for broader adoption of PSA technology in Wyoming’s gas processing industry.

Improving CO₂ Pipeline Infrastructure Design. The pipeline corrosion mitigation study addresses a challenge that will be shared by every future CO₂ pipeline project in Wyoming. As the state builds out

transportation infrastructure to connect CO₂ sources with storage sites, the findings from this study—particularly regarding material selection for aggressive sour gas environments—will be directly relevant to pipeline designers, operators, and regulators statewide.

Economic Development and Job Creation. The Dry Piney Project, once at full operation, will create significant employment and economic activity in Sublette County and the surrounding region. The drilling, construction, and long-term operations of the gas processing plant, gathering system, and well infrastructure will support both direct and indirect employment in communities that have historically relied on energy-sector activity.

7. Conclusions and Recommendations

The WEA-funded work described in this report has materially advanced the Dry Piney Helium & Carbon Sequestration Project and has generated technical knowledge with broad applicability to Wyoming’s energy future. The principal conclusions are:

The Bighorn Formation is a viable carbon storage reservoir. Prior to this project, the Bighorn was poorly characterized on the LaBarge Anticline. The data acquired through two deep appraisal wells, combined with seismic inversion and reservoir simulation, confirms that the Bighorn has the reservoir properties and capacity to serve as a significant CO₂ storage formation alongside the Madison. Blue Spruce has revised its development plan to include dedicated Bighorn injection wells as a direct result of this work.

The LaBarge structure holds greater CO₂ storage capacity than previously estimated. The discovery that the structure extends further than pre-drill models predicted, combined with favorable Bighorn reservoir properties, indicates that the sequestration capacity of the LaBarge Anticline is significantly larger than prior estimates. This has implications not only for the Dry Piney Project but for the broader potential to utilize this structure as a regional carbon storage hub.

Pressure Swing Adsorption is a promising technology for Wyoming gas processing. PSA offers meaningful advantages over chemical solvent systems in terms of safety, environmental impact, operating costs, and adaptability for carbon capture. Blue Spruce recommends that WEA and the State of Wyoming continue to support the evaluation and potential deployment of PSA technology in Wyoming gas processing applications.

Pipeline corrosion protection options exist across a wide cost spectrum. The front-end engineering study provides a detailed comparison of corrosion protection approaches that will be relevant to any future sour gas or CO₂ pipeline in Wyoming. Blue Spruce is continuing laboratory testing to validate the most cost-effective solutions under project-specific conditions.

The integration of helium production with carbon sequestration creates a compelling and unique project model. The Dry Piney Project demonstrates that commercial helium and natural gas production can be combined with large-scale permanent carbon sequestration in a single integrated operation. This model leverages the natural geologic advantages of Wyoming's deep formations and positions the state as a leader in both critical mineral supply and carbon management.

8. Path Forward

Blue Spruce is advancing the Dry Piney Project toward a final investment decision. The data and engineering work funded through the WEA Energy Matching Funds Program has been instrumental in de-risking the project and informing the development plan. Key remaining activities include advancing detailed engineering design on the gas processing facility and gathering system, and securing acceptable terms to construct the gas processing facility.

Blue Spruce intends to make relevant technical data from this project available to the scientific and regulatory community, including wireline log data, image logs, and sidewall core samples, to support ongoing research into Wyoming's deep geologic formations and carbon sequestration potential. Blue

Spruce has offered to provide drill cuttings samples to the Wyoming State Geological Survey, the University of Wyoming School of Energy Resources, or other agencies as desired by the WEA.

The Dry Piney Project represents a significant step forward for Wyoming's energy economy, combining critical helium production, carbon management, and natural gas development in a manner that leverages the state's unique geologic endowment. Blue Spruce appreciates the partnership with the Wyoming Energy Authority and the vision of the Energy Matching Funds Program in supporting projects that position Wyoming for long-term energy leadership.