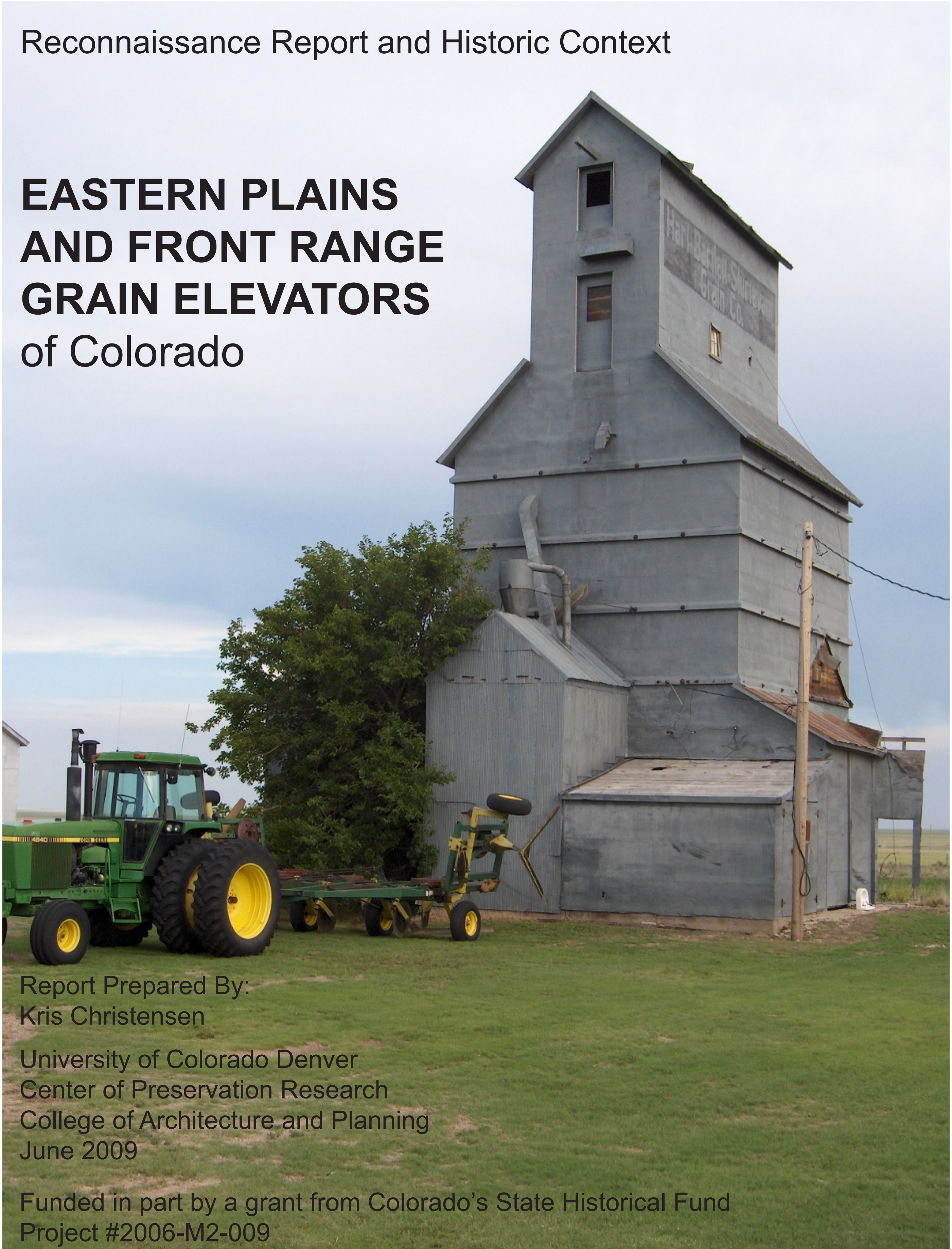
Reconnaissance Report and Historic Context



EASTERN PLAINS AND FRONT RANGE GRAIN ELEVATORS of Colorado

Report Prepared By:
Kris Christensen

University of Colorado Denver
Center of Preservation Research
College of Architecture and Planning

June 2009

Funded in part by a grant from Colorado’s State Historical Fund
Project #2006-M2-009

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Acknowledgements

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And most importantly to the late Dale Heckendorn who encouraged and inspired this project thirteen years ago when he asked me to prepare the nomination of the Grover Grain Elevator for designation to the Colorado State Register of Historic Places.

Finally, thanks to Lance Christensen and Patricia Hill for their understanding and patience.

This report was artfully designed by Julie D'Ascanio, University of Colorado Denver.

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INTRODUCTION

PROJECT PURPOSE

Grain elevators are one of the most iconic of all structures on the plains of the United States and Canada. They not only contribute to the economies of rural communities, but also serve as way finders in sparsely settled areas. Colorado boasts a variety of types of grain elevators, many of which face threats due to changes in agriculture that have resulted in abandonment, demolition or neglect. Under the guidance of faculty (Ekaterini Vlahos, Associate Professor and Kris Christensen, PhD student/Graduate Part-Time Instructor), the students at the University of Colorado Denver prepared all products for this State Historical Fund grant project. This project fulfilled multiple purposes: 1) a photo documentation of extant elevators, 2) a contextual study, and 3) an educational opportunity for students. During the first phase, faculty and students located, photographed and documented grain elevators along the Front Range and Eastern Plains of Colorado at the reconnaissance level. The reconnaissance survey included all extant grain elevators regardless of construction date, determined condition and current use for the elevators, and developed a prioritized list of elevators warranting further intensive study. The reconnaissance results appear in Appendix 1 of this document.

This document also serves as a contextual study. It provides future researchers access to information about the history and development of grain elevators. Such details are vital for conducting future intensive survey work on individual properties. It also may serve as the basis for the future development of a National Register multiple property nomination for elevators on Colorado's Eastern Plains. The historical background portion of the document includes a pictorial guide of elevator types and historic themes associated with understanding these structures.

Finally, the project served as an educational opportunity for graduate students at the University of Colorado Denver in the College of Architecture and Planning. Students learned how to conduct a selective reconnaissance survey, developed research skills, and had the opportunity to synthesize their findings. Seven students from the architecture and planning disciplines participated in a summer course in 2006, focusing primarily on the reconnaissance survey and the research process for gathering background material for this report. These seven students were: Priscilla Aguirre (architecture), Tiffany Coppock (architecture/preservation certificate), Leo Darnell (architecture), Candace Lothian (planning/preservation certificate), Casie Radford (architecture/preservation certificate) and Josh Voeller (architecture). Two students (Tiffany Coppock and Casie Radford) continued to work on the project during the fall semester of 2006, finalizing the reconnaissance survey. Tiffany Coppock continued her participation in 2007 to develop the survey database.

This report is organized in three parts. The first summarizes the reconnaissance survey. It includes a description of the project area, research design, methodology, and survey results. The second part serves as the context study, discussing the history of grain elevators. The final section provides guidance for future intensive level surveys and investigation. The report includes appendices with survey results and a research guide for future investigations.

FUNDING

This project was partially funded by a State Historical Fund grant award (project number 06-M2-009) from the Colorado Historical Society. The College of Architecture and Planning at the University of Colorado Denver provided funds for faculty and PhD/Graduate Part-Time instructor salaries. Some students received funds from the AmeriCorps Program, which provides tuition assistance or loan payments for students participating in community-oriented projects.

RECONNAISSANCE SURVEY REPORT

PROJECT AREA

Based upon the shared agricultural history, Kris Christensen, in consultation with SHF staff, selected the Front Range and Eastern Plains as the focus of this project. The Front Range area included those counties along I-25, which is the major north/south interstate in Colorado. The Eastern Plains area encompassed counties from east of the I-25 corridor to the Colorado border. Grouping counties regionally facilitated organization of the research and travel. Maps of the project area are located in Appendix 1 of this document. From north to south the groupings of counties researched are:

Northern Front Range: Larimer, Boulder, Jefferson, Denver, and Arapahoe counties.

Southern Front Range: Elbert, El Paso, Douglas, and Pueblo counties.

North East: Weld, Fort Morgan, Logan, Washington, Sedgwick, Phillips, and Yuma counties.

Central East: Lincoln, Kit Carson, Cheyenne, Crowley, and Kiowa counties.

South East: Huerfano, Otero, Las Animas, Bent, Prowers, and Baca counties.

Note: Resources west of I-25 were not investigated as part of the reconnaissance survey since the agricultural history in terms of climate, crops, and overall agricultural traditions differs substantially from that of the Front Range and Eastern Plains.

RESEARCH DESIGN & METHODOLOGY

The objective of this project was to locate, identify, and record as many grain elevators as possible in the designated research area. Location and identification of these resources provides a better understanding of grain elevators and establishes a foundation for future intensive inventory work. It was important to visit the sites and to compile a basic level of both photo and observational documentation before these grain elevators are potentially lost to threats such as abandonment or hazards such as fire and vandalism.

The lack of previous studies necessitated using a reconnaissance level survey to act as a planning tool for future intensive investigations. The study includes recommendations on priorities for intensive survey. This project is a first step in what, hopefully, will be a continuing effort to study elevators and eventually prepare State or National Register designations for eligible elevators.

The project focused on active and inactive commercial grain elevators, resources located almost exclusively along existing or former rail lines. Defining features of commercial elevators include a shed for truck entry; grain pit; wood, steel or concrete construction; and internal grain bins.

The project did not document resources identified as grain elevators, silos, granaries, or single grain storage units appearing on non-commercial private property.

The broad majority of commercial grain elevators are located on railroad routes. Student researchers utilized the Colorado Railroad Map published by the Colorado Railroad Museum and any necessary highway and local maps to identify locations of resources. Utilizing the Colorado Railroad Map ensured that only commercial grain elevators were documented. Student researchers also utilized fire insurance maps to supplement information from these sources. Publications about the spacing of elevators along rail lines were useful in identifying potential resource locations. Students then traveled these routes, where accessible, to document the resources.

Since grain elevators are at risk of sudden loss, photographic data collection was a key method to ensure these elevators received at least a minimal amount of documentation. Grain elevators were recorded regardless of age or potential eligibility. Students took digital photographs of all property elevations visible from the public right of way or all sides when owners/owner representatives granted verbal permission to enter the property. The Office of Archaeology and Historic Preservation provided the naming conventions for the digital photographic files. Files are in a tiff format and organized by county, town, and then elevator. Digital photographs are located at the Colorado Historical Society's Office of Archeology and Historic Preservation, with copies retained at the Center of Preservation Research in the College of Architecture and Planning at UCD.

In addition to digital photography, the researchers recorded visual observations as field notes. Field notes focused on type of structure, associated buildings, and location. Library research focused on the broader understanding of the role of grain elevators in Colorado; however, in the process students did uncover information on some of the individual resources. Field notes are available at the Office of Archaeology and Historic Preservation through a searchable database for future intensive surveys. The archival and library research undertaken to examine broader historic themes associated with grain elevators was an important part of this project, crucial to completing the context/historical background portion of this document. Local libraries and historical societies provided useful information for the historic context. Students and principals utilized central research centers such as the Denver Public Library and the Stephen H. Hart Library at the Colorado Historical Society and used resource files from the Office of Archaeology and Historic Preservation's Compass database. Research also was conducted at the Colorado State Archives and the libraries at the University of Northern Colorado, University of Colorado Boulder, Auraria Campus, Colorado State University, and the Colorado Railroad Museum. Researchers took advantage of the various resources available on the World Wide Web; key sources included web sites for the federal government, farming and grain elevator ownership associations, historical societies, and sites with numerical information such as population and crop statistics.

The completed reconnaissance survey did not make determinations of field eligibility; however, the context document provides guidance for further evaluation. Eligibility determinations for individual elevators may be made during a future intensive survey. Project organizers expected several outcomes from the completed, grant-funded project: a reasonably comprehensive list of grain elevators and their locations, the completion of a reconnaissance survey report with context study, and a number of recommendations for further research efforts. All three outcomes were accomplished.

A summary of properties inventoried and their survey priorities (high-within five years, moderate-within five to eight years, low-as resources become available) is included as an attachment to this report as Appendix 2. The scale system is based on age, if the elevator is in active use, and overall threat. This data is available for future intensive surveys and was utilized in developing the context portion of this report.

The reconnaissance survey was completed between June 2006 and May 2007. After analysis of collected data, additional research occurred between May 2007 and August 2008.

There was little deviation from the research design. However, the research and documentation took significantly longer than anticipated due to the large geographic area covered and the greater than expected number of grain elevators identified. The period in which students had to conduct their work, one summer semester, left areas of the Front Range and Eastern Plains unsurveyed. For this reason, research assistants were hired and the project time line was extended. Kris Christensen, PhD Student/Graduate Part-Time Instructor, provided project oversight, student training, consolidation of data, and report preparation. Associate Professor Ekaterini Vlahos acted as principal investigator.

SURVEY RESULTS

Through the reconnaissance survey, the student researchers were able to establish location, type, style and condition of the Front Range and Eastern Plains grain elevator resources. Appendix 2 summarizes the findings of this project. A brief summary follows: A total 308 grain elevators, mills, warehouses, and feed handling centers were located and photographed during the reconnaissance survey. Documentation of resources was not based on age and included post-World War II structures as well as those constructed prior to that date. Of the grain elevators surveyed, 55 were wood cribbed, 50 were wood frame, 58 were steel, 95 were concrete, 37 were feed handling centers, 10 were mills, and 3 were warehouses (see text related to *construction methods and types* on page 20).

The reconnaissance survey set priorities for future intensive survey; the goal of future intensive surveys is to determine eligibility for designation to the National Register of Historic Places. Appendix 2 shows a prioritization of the resources for future intensive survey. As both a survey report and contextual study, this document represents a single narrative exploring key historic periods (including important events or influences) and a number of general themes, as shown below.

The periods of development are:

1860-1900:	Early Agricultural History Depression and Drought of the 1890s Railroad Development
1900-1929:	Railroad Expansion Dry land Farming World War I

1929-1945: Great Depression
Drought
Soil Conservation Service and Federal Lands
World War II

1945-Present: Farm Mechanization and Increased Production
Crop Land Ownership
Railroad Abandonment
Development of the Interstate Highway System
Technological Advances for Grain Elevators

The themes associated with the above time periods are:

Farming
Farmers' Co-op and Line Operators
Railroad Transportation
Non-railroad Transportation
Industries

HISTORICAL BACKGROUND

INTRODUCTION

The commercial grain elevator was invented in the United States and was quickly adopted by Canada and later other grain producing countries. It is an invention of necessity, arising from the need for greater efficiency and cost effectiveness in transporting grain as a commodity. As such, the grain elevator fulfills numerous functions for a variety of products. In addition to handling cereal and feed products (corn, wheat, barley, rice, sorghum, millet, oats, rye, and buckwheat among others), grain elevators also serve as distribution and storage facilities for products such as a variety of seeds, dry beans, and lentils. The grain elevator acts as a receiving station for such products, where they are weighed, graded for type and quality, cleaned, and dried. It also serves as a shipping point from which products are transferred into the market place and to the final user. The goal is to accomplish all these tasks with the least amount of labor and power (Fornari 1982).

Prior to the introduction of grain elevators, transportation and storage of cereal products was cumbersome. The primary method of storing grain prior to 1842 was in warehouses known as flathouses. These structures were a single story designed to store sacks or piles of grain prior to transport to end users. Shippers who transported the grain disliked bulk and sack storage. It was an inefficient use of space, requiring a great deal of time to load, move or stack (Frame 1990; Henderson and Brennan 1999).

As crop production increased in the Midwest in the early part of the 19th century, it became necessary to handle grain at multiple transfer points on its way east to processing facilities or directly to market. Buffalo, New York, became one of the chief shipping points in the northern United States when the Erie Canal opened in 1825. Between 1830 and 1840, as more land was cultivated, the amount of grain produced and shipped increased dramatically. It was evident that a cost effective method was needed to unload, load, and store grain shipments:

> …the universal method of transfer was to raise the grain from the hold of the vessel, in barrels, by tackle and block, to weigh it with hopper and scale swung over the hatchway of the canal boat, or carry it into the warehouse in bags, or baskets, on men's shoulders… Only ten or fifteen bushels were commonly weighed at a draft; and the most that could be accomplished in a day with a full set of hands, was to transfer some eighteen hundred or two thousand bushels, and this only when the weather was fair. (Dart, quoted in Frame 1990, 264)

Joseph Dart, an inventor, saw the need for a solution to this problem and developed the first steam-powered grain elevator. Dart took advantage of ideas developed by inventor Oliver Evans for the first steam-powered gristmill. Rather than having a warehouseman carry grain to the top of the mill, the steam-powered gristmill utilized the elevator leg, a continuous vertical conveyor belt with attached buckets that scooped grain upward where it was gravity fed into the mill. Dart's designs used the elevator bucket assembly of the gristmill to elevate the grain for transfer through spouts that led to bins for storage and eventual transportation to its final destination.

Dart admitted the invention of the grain elevator was as much Oliver Evans' innovation as his own. However, what made Dart's designs unique was the adaptation of Evans' elevator leg to unload grain from barges. The first of Dart's designs was an all-wood building constructed by Robert Dunbar in Buffalo, New York, in 1843. The use of this technology changed the speed at which a barge could be unloaded, from a rate of 1,800 to 2,000 bushels per day to 1,000 bushels per hour. Bringing the buckets closer together doubled that speed. Dart's designs quickly became the model for several grain elevators in Buffalo, and the concept quickly spread to both American and Canadian major shipping ports such as those in the Great Lakes region, along the Atlantic coastline, and in New Orleans (Fornari 1982; Gambrell 2005).

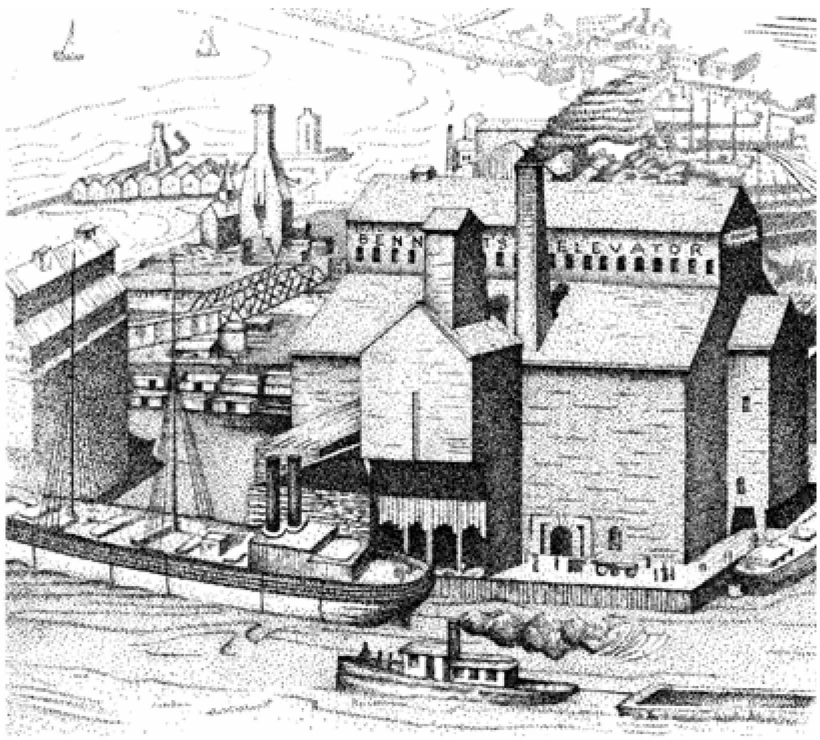


Figure 1: Excerpt from HAER Drawing, Buffalo Grain Elevators (HAER 1968)

Grain elevators did not remain limited to the large structures in the Great Lakes and East Coast regions of the United States and Canada. The inherent value of smaller elevators, in eliminating flathouses and facilitating storage and transportation to larger facilities, quickly became apparent to grain producing communities. Engineers quickly realized technology from the large terminals could easily be adapted on a smaller scale, thus leading to the creation of the country elevator. The country grain elevator is one of two types of commercial elevators; the second is the terminal (further subdivided into in-land or sub-terminal and export) grain elevator, discussed below. A country elevator's purpose is to receive the grain directly from the farmer for delivery to a terminal. Country elevators range in capacity from small structures under 100,000 bushels to facilities over one million bushels (OSHA 1983). Country elevators are located every six to ten miles or so along a railroad line to connect the farmer to the more distant grain market. According to grain elevator historian Barb Selyem, "This spacing created by the railroads was based on the availability of water and fuel, potential grain production, the ability of the farmer to deliver his harvest by team and wagon and return home the same day, and to prevent other rail lines from building in the same area" (Selyem 2000, 1). Country elevators come in several types: wood (both stud and crib), steel (with and without external legs), brick, tile, and concrete (Selyem 2000). For details on construction methods, refer to *Construction and Building Materials* on page 20.

Terminal grain elevators are classified according to function, including export, transfer, in-land (sometimes referred to as sub-terminal), receiving, and cleaning. In-land and receiving terminals are the only two types found in Colorado. In-land terminals receive grain shipments either directly from the farmer or from the country elevator. The in-land terminal is responsible for grain storage; improvement of quality through cleaning, drying, washing, and separating; and shipment of the grain to the end user or an export terminal (Frame 1990). Typically in-land terminal grain elevators have capacities of ten million bushels or greater (OSHA 1983). Also found in Colorado are receiving terminal elevators. A receiving terminal is located at a processing plant (Frame 1990). Examples of receiving terminal elevators include flourmills, breweries, bio-fuel plants, and feed mills. The processing plant determines the storage capacity needs, influenced by the speed at which they use grain.

Figure 2: Country and Terminal Grain Elevators, Julesburg, Colorado, University of Colorado Denver

There are no export terminals or transfer terminals in Colorado as they primarily are located along waterways. Export terminals are those on major trade or export routes (New Orleans, Minneapolis, and Buffalo among others). A transfer terminal has minimal storage, but maximum handling capacities. The design of cleaning elevators excludes space for extended storage (Frame 1990).

OPERATIONS

The operation of a grain elevator is a rather simple and elegant process, with only minor differences between the country and the terminal elevators largely attributable to the size and number of bins. When a grain load arrives at an elevator, the first step is to have the truck's load weighed and the grain inspected. This can occur at an outdoor scale or at a receiving scale at the grain pit. Inspection of the grain for type, grade, moisture content, and infestations is the next step in the process. The results of this inspection aid in the decision regarding the bin in which the grain will be stored. Many elevators specialize in a specific type of grain (such as wheat or corn). The operator may refuse the shipment if the grain is of poor quality or if it has an infestation such as insects, bacteria or evidence of vermin.

Once type, grade, moisture content, and load weight are determined, the delivery truck proceeds through a covered driveway to a receiving pit where the grain is unloaded. The driver dumps his load into the pit (also referred to as the front pit) (Figure 5, 1 and 2). In the head house of the elevator, the operator connects the garner or distributor spout (Figure 4 and 5) to direct the grain to the appropriate bin, to annex storage via a conveyor in a terminal elevator or directly onto rail cars.

Once the destination for the grain is determined, the head drive motor starts and the grain is elevated to the top of the elevator. The drive motor runs the elevator leg, which is an enclosed continuous belt with buckets attached (Figure 5, 3). The buckets scoop grain from the pit and release it in the head house for storage in bins or loading into rail cars (Figure 4 and 5). Some elevators have an auger added to help deliver the grain to the elevator leg. The grain can be stored in the bins until prices are most favorable or transportation is available. Elevator managers track bin assignments for the stored grain. Prior to leaving the site, the operator weighs the empty truck. The difference between the full and empty weight determines the total shipment of grain received.

When the grain is to be shipped via rail, the empty rail car is inspected for cleanliness and soundness prior to loading. The grain moves from the bin into the hopper scale/mixer where it is mixed and weighed and then released into the elevator's rear pit (Figure 5, 6 and 7). The elevator leg lifts the grain to the distributor from the rear pit to the spout leading to the rail car where it is loaded for transport (Figure 5, 8). Once the rail cars are loaded and closed, they proceed to a terminal or receiving elevator (Walton Feed 1997).

The process in a terminal elevator differs only in terms of elevator size; the general principles remain the same. The grain goes through the same inspection and weighing process. The grain load is dumped into the pit where it is either gravity- or auger-fed to the elevator leg. At the top of the head house, the grain is either distributed to a cleaner, a dryer, bin storage or load bin either through a gravity feed system or conveyor belt.

Once the correct bin is determined, buckets raise the grain to the top of the head house where it goes along a conveyor or through a distributor to the appropriate bin. In a modern in-land terminal grain in the bins is aerated, fumigated, and monitored for temperature while awaiting transport.

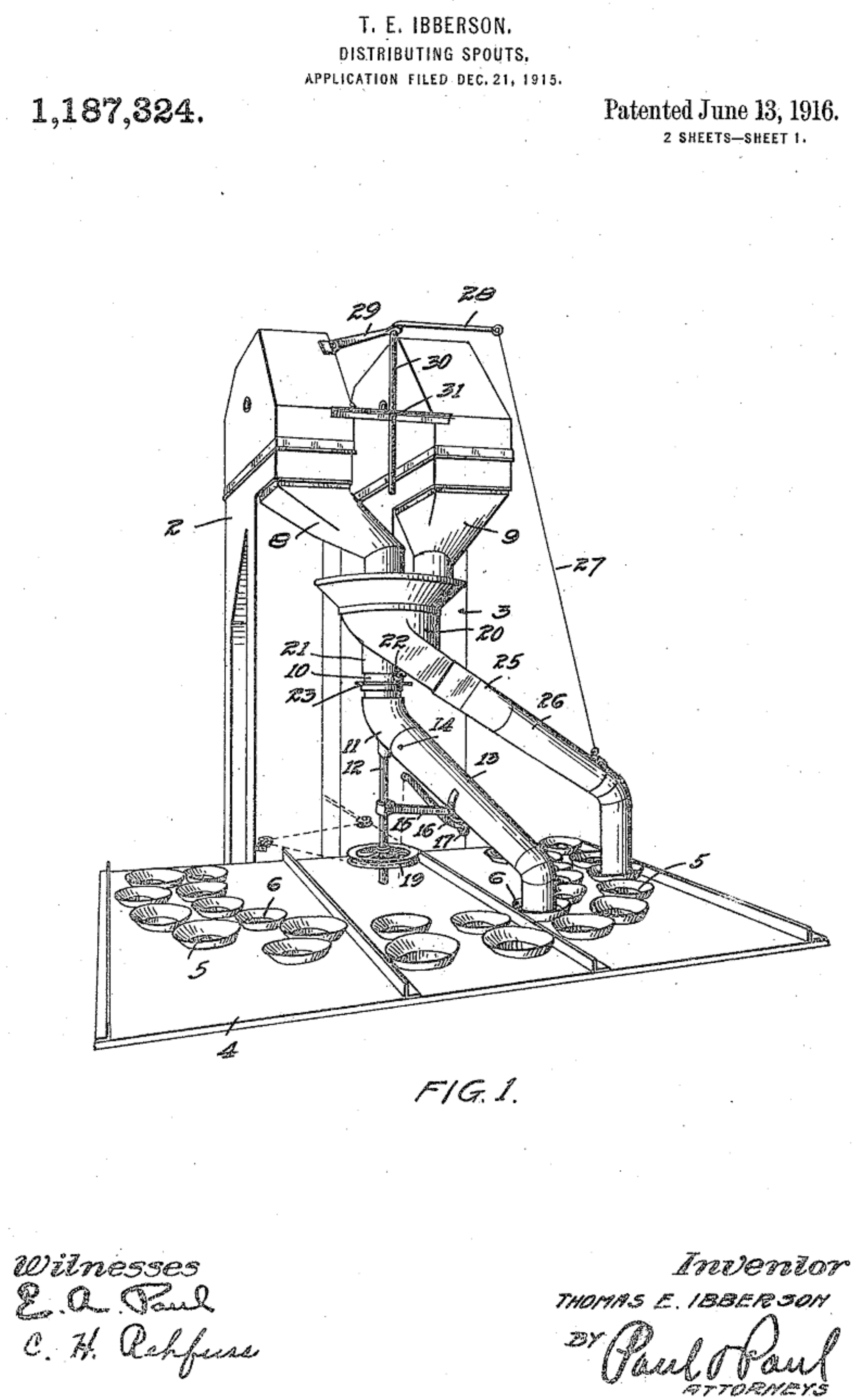


Figure 3: Patent Drawing, Elevator Distributor, United States Patent Office (Ibberson, 1916)

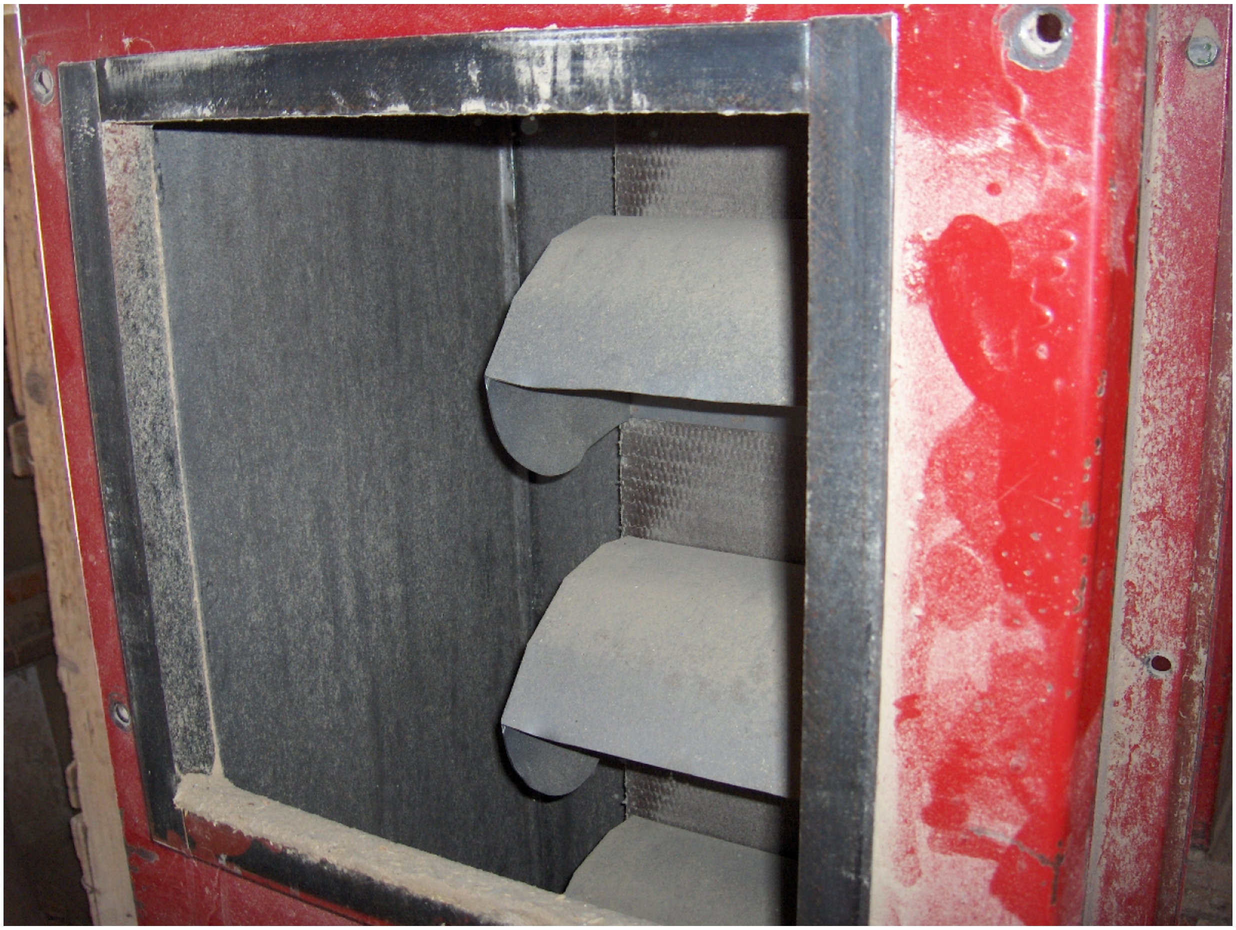
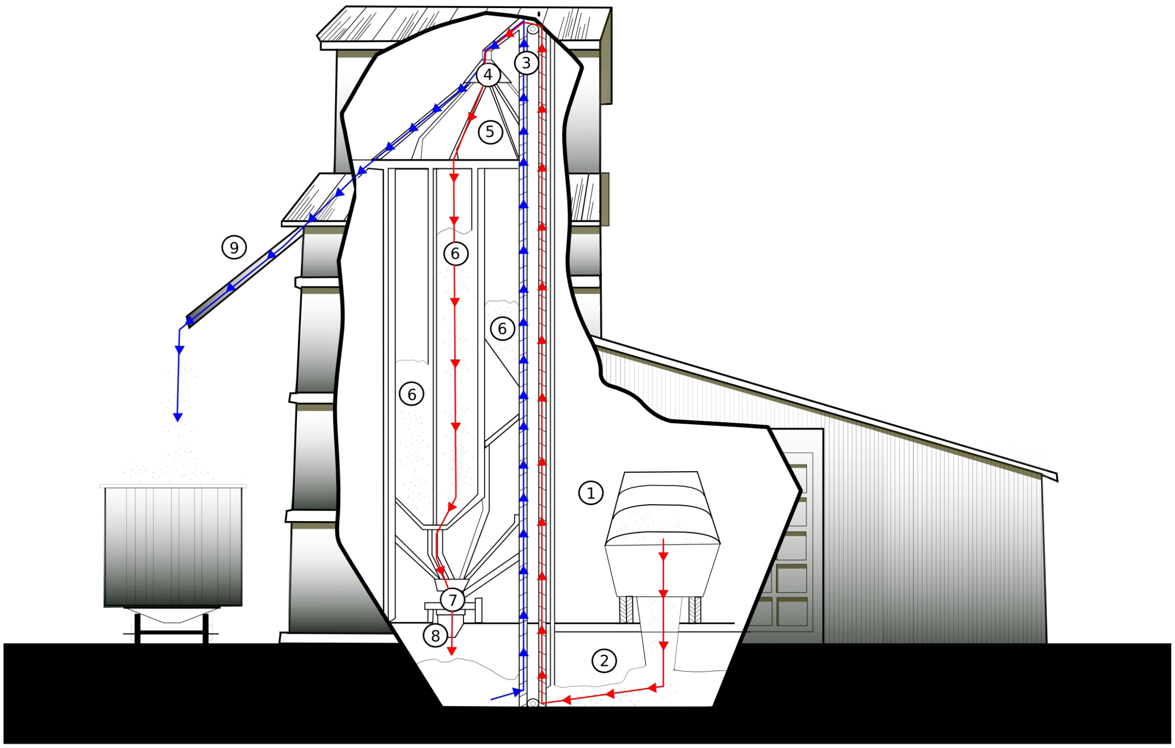


Figure 4: Country Grain Elevator Leg, La Junta, Colorado University of Colorado Denver

Temperature monitoring is crucial since grains are highly combustible and excess heat can cause fires or explosions.

Off-loading to the rail cars at terminal elevators is similar to the process followed at country elevators. In-land terminals generally have a separate pit and leg system for this purpose. At the in-land terminal, the grain is released from the bins to a surge bin (a storage area for grain prepared for transportation) prior to the shipping scale. At the scale it is weighed, sampled for grade and quality, then loaded to the rail car. Depending on the type of grain, the product may go through a cleaning system prior to loading (Schnake and Stevens 1983).

GRAIN ELEVATOR FLOW DIAGRAM



Drawing by Jeanne Ramsay

1 DRIVEWAY / SCALE
2 PIT
3 LEG
4 DISTRIBUTOR
5 BIN SPOUTS
6 STORAGE BINS
7 MIXER
8 BACK HOPPER
9 RAIL CAR SPOUT

Figure 5: Diagram illustrating grain movement within an elevator, Jeanne Ramsay, University of Colorado Denver

Figure 6: Terminal Elevator Conveyor, Paoli, Colorado, University of Colorado Denver

CONSTRUCTION AND BUILDING MATERIALS

Regardless of the material used, several factors have influenced elevator construction technology over the past one and a half centuries. These factors have included providing for the ongoing needs for increasing capacity, protecting grain from the elements, building strong structures to contain grain and, most importantly, erecting structures able to withstand explosions and fires. There are six types of materials used in the construction of grain elevators: wood (frame and cribbed), brick, steel, clay tile, concrete, and iron. In Colorado, the primary materials used are wood, steel, and concrete. The reconnaissance survey identified only a few elevators of brick construction. The discussion of materials below focuses only on those materials used in the construction of Colorado grain elevators.

Wood

Wood was the earliest material used for grain elevator construction and remained a dominant building material until the end of World War II, particularly for rural (country) grain elevators. Wood was often a readily available resource in rural areas and was certainly accessible in the Great Plains after the construction of rail lines. Advantages of wood include: cost-efficiency, sturdiness, and ease of use. Wood elevators come in two types, cribbed (stacked lumber) and studded (balloon frame) (Frame 1990).

The crib elevator uses a system of stacked 2x10s, 2x8s, 2x6s, and 2x4s. Crib construction is both the most structurally stable and most common of the two types of wood elevator construction. The planks of wood are "…laid flat in a rectangle or square (larger boards on the bottom decreasing in size near the top), and held together with large metal spikes. The walls interlock like logs in cabin construction" (Mahar-Keplinger 1993, 18). Cribbed elevators usually feature one of three roof configurations: triangular cupola, rectangular cupola or setback triangular cupola. The driveway shed and the cupola of cribbed elevators are erected utilizing stud construction techniques as grain pressure is not a concern (Mahar-Keplinger 1993).

Figure 7: Cribbed Elevator, Campo, Colorado, University of Colorado Denver

The stud elevator utilizes traditional methods of balloon frame construction. Although a more cost-effective method of construction than cribbed, stud frame construction lacks an equivalent durability. The availability of standardized lumber through the railroads made this type of elevator possible. "The exterior is nearly identical in appearance to that of the cribbed elevator except for the horizontal bands that run around the structure. The bands are made of wood penetrated by tie rods that extend through the elevator interior to support the bins" (Mahar-Keplinger 1993, 18). Variations in stud construction result from both the relationship of the bin structure to the cupola and the pattern of the support bands that encircle the structure (Mahar-Keplinger 1993). The roofs of stud elevators most closely resemble the triangular cupola used for crib elevators.

Figure 8: Interior Cribbed Elevator, La Junta, Colorado, University of Colorado Denver

Wood is far from perfect as a building material. The chief problem with the use of wood is fire. “The exorbitant cost of replacing fire-prone wood elevators at an average of every four years, combined with high insurance rates, led to the experimentation with alternative materials…” (Mahar-Keplinger 1993). Among the methods used to make the wood elevator fire resistant is to clad the exterior with, most commonly, metal (corrugated steel) or asbestos. The cladding prevents stray sparks from rail cars and other external sources from igniting the elevator. All grain elevators, due to the volatile and explosive nature of grain dust, post no smoking signs and follow rigorous safety codes. Still, mechanical problems, including sparks from either the buckets or seized machinery can ignite a devastating fire quickly. Adherence to strict safety codes (undoubted driven by the insurance industry) and diligence on machinery maintenance have contributed to the longevity of the few original wood elevators remaining. When communities lost their wood elevators to fire, they would either construct another of wood or employ alternative building materials to avoid future loss and to lower insurance premiums.

Another disadvantage of using wood has been the difficulty of connecting additional storage bins directly to the existing structure. Wooden structures are self-contained and additional storage only can be added to the exterior of the elevator (Mahar-Keplinger 1993). Enlarging wooden grain elevators most commonly has involved adding exterior bins, usually made of steel, and routing the grain through the head house and then out to these bins through spouts or conveyors.

Figure 9: Stud Elevator, Pritchett, Colorado, University of Colorado Denver

Figure 10: Expanded Wood Elevator, Raymer, Colorado, University of Colorado Denver

Steel

There were two eras of development of the steel elevator. The first period covers steel techniques employed prior to 1930 and the second encompasses steel applications used since World War II. Elevators constructed prior to 1930 utilized curved plates of steel riveted and welded to form circular bins. The elevator leg and head house on these earlier elevators were either separate or added on top of the bins. A variety of pre-1930 design elevators were built, however, they are rare and Colorado only has a few extant examples.

Figure 11: Steel Tile Elevator, County Road 20, Larimer County, University of Colorado Denver

During World War II, farmers were producing large quantities of surplus grain. The government provided prefabricated steel bins to elevator owners at low prices, and such bins became a popular method of expanding elevator capacity. In fact, the use of prefabricated steel bins continues to the present day (Mahar-Keplinger 1993). A number of manufacturing and design methods allow for a variety of shapes and sizes of steel bins. These elevators are constructed using prefabricated corrugated steel bins with conical roofs. The filling spouts extend out of the elevator through the head house to the bins with all processes to move grain being external. Grain elevator operators, farmers, and ranchers all use this elevator type which is also called a grain-handling system or grain feed handling center.

Steel has advantages and disadvantages. With their external legs, the fire risk from mechanical causes in steel elevators is relatively low. Steel elevators also are easy to construct and potentially mobile. However, the substantial temperature swings associated with the poor insulation of such elevators demonstrates that steel is not the best material for elevator construction.

"Steel, a poor thermal insulator, proved incapable of providing protection of the grain through the harsh summers and winters" (Mahar-Keplinger 1993). Fortunately, new technologies in grain aeration addressed the inadequacies of such seasonal extremes, making the steel bins an ideal, inexpensive add-on material to country grain elevators for shorter-term storage.

Figure 12: Steel Bin Elevator, Kit Carson, Colorado, University of Colorado Denver

Figure 13: Steel Tile Elevator with Open Leg, Cheyenne Wells, Colorado, University of Colorado Denver

Figure 14: Steel Silo Feed Handling Center, Bethune, Colorado, University of Colorado Denver

Concrete

At the turn of the century, concrete quickly became the most popular fire resistant material for grain elevator construction. It is still preferred today for any operation of substantial size.

Concrete grain elevators draw their inspiration from earlier wood elevators. Although concrete elevators are taller and have greater capacity, they generally exhibit the same physical features as wood elevators, namely a central workhouse with an elevator leg. Regardless of whether the bins are square or round, the design of concrete elevators seeks to create structural stability and minimize wasted space (Mahar-Keplinger 1993).

The first concrete elevator appeared in Duluth, Minnesota, in 1899. However, grain dealer Frank H. Peavey and contractor Charles F. Haglin were not completely successful with this first attempt. Often referred to as “Peavy’s Folly,” the first concrete elevator had structural deficiencies leading to the collapse of one of the bins in 1900 and another in 1903. These collapses occurred because the six-foot walls connecting the bins proved too weak to bear the pressure of the grain. Adding additional reinforcing steel, thicker walls, and heavier abutments to improve the structural strength of the concrete elevator resolved the problems caused by pressure from the grain (Frame 1990). Through the investigation of such failures, engineers became interested in improving the construction methods of concrete grain elevators.

Figure 15: Peavy-Haglin Experimental Concrete Elevator, St. Louis Park, Minnesota (HAER)

The first example of slip form concrete construction in grain elevators was in Port Arthur, Ontario, in 1903. In the slip form construction method for the reinforced concrete elevator, the structure is created through a process of continuous movement or “slipping” of a form as the concrete is poured through a web of steel reinforcing rods. “The slip form was raised by traveling on eight 1 ¼-inch diameter steel vertical jack rods that were embedded and left in the middle of the completed walls” (Frame 1990). Earlier concrete methods would pour new concrete onto previously hardened concrete, creating joints instead of a single contiguous wall of concrete. The slip form process solved the problem of the inherent weakness of the joints, which could split from grain pressure. Elevator construction based on the basic slip form technique resulted in the development of numerous patents. A wide variety of round and square binned elevators, elevator workhouses, and other similar structures resulted from these creative efforts in design (Frame 1990).

Originally intended for use with large terminal elevators, slip form reinforced concrete construction was seen as advantageous for the construction of smaller country elevators as well. Simple, relatively small capacity elevator plans were available and some contractors began to specialize in their construction.

Figure 16: Concrete Country Elevator, Genoa, Colorado, University of Colorado Denver

In the Front Range and Eastern Plains regions of Colorado, all extant terminal elevators are reinforced concrete. There are three types of concrete terminal grain elevators in the state: first generation, second-generation conveyor, and second-generation head house. First generation concrete elevators use a spout distributor to direct grain to bins, much like country elevators. Early second-generation concrete elevators utilize conveyors that run the length of the elevator and into the cupola to direct grain to bins. Later second-generation concrete elevators have a head house at one end that contains the scales, legs, and cleaning equipment (Frame 1990).

Figure 17: Concrete In-land Terminal Elevator, Amherst, Colorado, University of Colorado Denver

Brick

In Colorado, brick was the least popular building material for grain elevators and was not widely used. Brick was more commonly used for warehouses or mills directly associated with elevators. Brick grain elevators can have square or round storage bins. Although rated well for fire safety, brick lacked the compressive strength of reinforced concrete, a material coming into use at the same time (Frame 1990; Mahar-Keplinger 1993). Brick grain elevators commonly had square cupolas and a boxy type shape that gave them an industrial character (Frame 1990; Mahar-Keplinger 1993).

Construction of brick elevators utilized traditional bricklaying methods. The primary downside of utilizing brick is its lack of compressive strength. The pressures of grain on mortar joints often caused bulging. In some cases, the bins had concave curves to add to the elevator’s tensile strength. Brick is unable to withstand the force of a catastrophic explosion as well as concrete or cribbed wood. In addition, most communities lacked local brick works and needed to import materials. While this situation could be true of lumber as well, wood was more readily available in many areas of the country and often more cost-effective.

Figure 18: Loveland Mill, Brick Construction, Loveland, Colorado, University of Colorado Denver

HISTORICAL THEMES

FARMING

Farming in Colorado dates back to the earliest Native American residents. As Mexicans later moved into the southern portion of the state they brought with them small-scale grain growing and grain milling. Farming as a burgeoning major industry emerged because of the Colorado Gold Rush. Miners needed supplies and shipping was prohibitively expensive. Many farmers and ranchers seized upon this opportunity and followed the miners west to develop their own agricultural gold mines through providing supplies to the miners. In fact, many miners who failed to find their fortunes in the Rocky Mountains later made their lives as farmers, ranchers and suppliers.

Early farms that focused on supplying miners typically were located within sixty miles of the mines at the base of the foothills. Farming was critical to the success of the mining industry (Abbott, Leonard et al. 1982). The close proximity of food supplies made them affordable for the average miner, many of whom were only moderately successful and earning very little. In fact, the suppliers were often the wealthiest members of a community. In addition to grain crops such as wheat and barley, farmers also supplied vegetable, fruit, and root crops to the mining camps. Grain products went directly to the towns that had modest flourmills. Arvada, Golden, Littleton, and Pueblo were just a few of the communities with flour milling by the 1870s.

Figure 19: Arvada Flour Mill, Arvada, Colorado, University of Colorado Denver

Irrigation for farming began shortly after miners arrived in the state. In 1859, Golden farmer David Wall constructed an irrigation system for his vegetable farm. Farming communities, such as Union Colony (Greeley), were the first agricultural areas to irrigate crops on a large scale (Mehls 1984). Large-scale crop irrigation allowed for greater yields and opened larger sections of land for farming. Front Range farming communities utilizing irrigation included Fort Collins, Littleton, Arvada, and Wheat Ridge. Water sources supplying irrigation in these communities included Clear Creek, Ralston Creek, Platte River, Big Thompson River, and Cherry Creek.

The farmers who settled this region took advantage of the Homestead, Timber Culture, and Desert Land Acts to claim from 40 to 640 acres and establish their homesteads. The 1862 Homestead Act allowed for the claim of up to 160 acres (one-quarter section). The Homestead Act was aimed at settling federal lands in the entire United States, not just the Midwest and West. However, it did not take settlers long to realize that 160 acres was insufficient to raise crops or livestock in the semiarid and arid regions of the West. In 1873, passage of the Timber Culture Act allowed settlers to homestead an additional 160 acres. The planting of trees on the property was a requirement for homesteaders taking advantage of the Timber Culture Act. This effort proved to be a failure in the West as farmers found it difficult to keep trees alive on the high plains. With passage of the 1877 Desert Land Act, specifically aimed at the arid and semi-arid regions of the American West, the federal government recognized the need for farmers to have greater acreage in order to encourage non-irrigated farming and enable farmers to achieve some measure of profitability. This act allowed settlers to claim 640 acres for homesteading. "The years 1886-1889 were all years of extensive settlement. 'Thousands are taking advantage,' wrote the editor of the Burlington Blade in May 1887 'of cheap, yes, free homes on the beautiful prairie of eastern Colorado. Still they come. More soon to follow'" (Dunbar 1944). While some abused the Homestead Act to control land and water, others saw opportunity for farming.

The temptation of free land and circulation of propaganda touting perpetual good weather fueled interest in migration to the Great Plains among farmers and created a belief there was sufficient moisture to grow crops without irrigation (Hargreaves 1948). Propaganda from bankers, chambers of commerce, state publicity departments, the railroads, and real estate brokers promoted the arid and semiarid West as a "Garden of Eden" to encourage further growth and development (Quisenberry 1977). Convinced there was sufficient annual moisture (with reported estimates of ten to twenty inches per year) to grow grain cops, the farmers brought with them the seeds and techniques they used in the more humid Midwest. This logic proved flawed since the farmers and promoters did not take into account the cyclical droughts experienced in the plains. These farmers quickly learned, with repeated crop failures, of the need for both region-specific agricultural techniques and grain species developed for conditions in this harsh climate.

Dry land farming (also known as dry farming and scientific farming) is a technique specifically developed for the semiarid regions of the United States. The agricultural activities focus on conserving moisture in the soil instead of irrigation.

> By taking advantage of local conditions of rainfall, by thorough cultivation, and by the selection of crops which withstand a considerable drought or which mature before the extra heat of the year is felt, it has been found possible to obtain profitable crops in a few localities in each arid State. The production per acre is usually small, but it is possible

> to compensate for this low average value by tilling large areas of the fertile, easily worked soil. (Hargreaves 1948)

The first areas to utilize this technique included dry valleys in California, Washington's Columbia Basin, western Kansas, and eastern Colorado. By the 1880s, Mormon settlements in Utah also employed the technique.

Hardy Webster Campbell often receives credit for the development of early dry land techniques. A farmer who homesteaded in the Dakota Territory in 1879, he realized, through five years of consecutive crop failures, the need to adjust his cultivation methods. A farmer rather than a scientist, Campbell's knowledge stemmed from his direct experience with farming in a region with marginal rainfall. He observed grass growing in wagon tracks while adjacent, untrampled land was barren; Campbell realized the importance of packing subsoils to help retain moisture. He developed

> …his first sub surface packer, a series of wedge-shaped wheels revolving about an axle, the wedges designed to cuts deep into the soil, packing it at the bottom of the cut while loosening the topsoil into a mulch. The principles of a packed subsoil with a loose topsoil were the essential elements of Campbell's system during the drought period of the nine ties, and formed the basis of the program which he sought to publicize… (Hargreaves 1948)

Campbell's methods sufficiently impressed railroad companies. Burlington, Northern Pacific, and Soo railroads sponsored Campbell to give lectures across the Great Plains in order to promote his methods, thereby encouraging dry land farming and attracting more farmers.

In addition to Campbell's activities, the passage of the Morrill Act in 1862, which established the national system of colleges partially funded with federal land grants and devoted to agriculture and mechanical arts education, proved important for improving farming methods and encouraging increased agricultural use and settlement. Railroad companies supported the state land grant institutions in the Great Plains, including the Agricultural College of Colorado (now Colorado State University), and assisted with the establishment of agricultural experimental stations to research and develop crops that would grow in the region's dryer, colder climates. The Hatch Act, passed in 1887, promoted this research through the establishment of such stations. The agricultural college in Colorado established the first station in 1888 in Fort Collins, with regional sub-stations established at Rocky Ford and Del Norte. Additions to the experimental stations included Table Rock (1891) and Cheyenne Wells (1892) (CSU 2008). Strains of Russian winter wheat were tested and hybridized and development of specialized techniques for dry land farming occurred at stations across the Great Plains (Hargreaves 1948).

The first dry land farming boom took place from 1886 to 1890. In the 1890s a severe drought lasting several years struck the Great Plains. Early dry land farming techniques developed by the experimental stations and entrepreneurs did not allow for fallow fields and replenishing crops. As the drought baked the land, depleted over-ploughed soils could not support crops. This situation, coupled with a nationwide depression that lowered commodity prices, resulted in the loss of livelihood for many Colorado farmers. The far eastern part of the state experienced the greatest impact. According to the US Census, the following population decreases occurred between 1890 and 1900:

	1890	1900
Kiowa County:	1,243	701
Kit Carson:	8,478	1,580
Phillips:	2,642	1,593
Washington:	2,301	1,241

While other parts of the state experienced stable, or in some places, increases in population, the above figures demonstrate the drought of the late 19th century had a definite impact on Colorado's early dry land farms.

The second dry land boom began as soon as rains returned to the Great Plains. The 1906 Adams Act provided experimental stations with funds to conduct theoretical research, with most of the energy directed at solving local agricultural problems (CSU 2008). The experimental stations researched both methods to improve upon those Campbell developed as well as seed development to create hearty grains. Researchers gradually recognized the importance of allowing fields to lay fallow and began to undertake crop rotation studies. The second boom provided relief from the drought conditions of the 1890s and coincided with skyrocketing grain prices during World War I.

Mechanization also influenced the grain industries. For example, introduction of the first friction drive tractor occurred in 1905 (Case 2007). The introduction of the Ford Model T made trucks available to and affordable for farmers, which enabled them to more quickly deliver their crops to grain elevators (Deere 2007). Quicker delivery meant greater profitability for their products and farmers' memories of the disasters of the 1890s soon faded. A real estate dealer stated, "The quicker you can get people to forget that [the] country was ever a dry country, the easier and quicker it will be to settle it up with good farmers" (Hargreaves 1948). Dry land farming increased to meet the both domestic and foreign demand for grain.

After World War I, however, decreased demand for grain in both domestic and foreign markets, spelled trouble for a failing commodities market. Severe droughts in the West in the 1930s, coupled with the stock market crash of 1929 and diminishing grain sales, made dry land become difficult, if not impossible, in some areas. Under the Franklin Delano Roosevelt administration, farmer relocations and the Department of Agriculture's establishment of the Soil Conservation Service in 1935 provided economic and ecological relief. During this period, hundreds of acres of marginal cropland returned to government ownership and management through tax defaults, purchase or condemnation. Land was either removed from use altogether or returned to grazing. The Forest Service, also under the management of the Department of Agriculture, managed the reclaimed grasslands and the Bureau of Land Management under the Department of the Interior managed the grazing lands. With the federal government's removal of marginal lands from crop production and federally controlled grazing, agricultural-dependent towns on the plains began to fail.

However, there was a resurgence of these towns by the end of the 1930s. As land began recovering after the drought dry land farming was revived and with the onset of World War II grain prices began to rise again. Lessons learned during the 1930s, agricultural station research, methods of alternating crops, planning so adjacent fields were not fallow at the same time, and overall management of soil conditions allowed dry land farming to have some success.

After World War II continued improvements in farm mechanization and the use of chemical fertilizers and pesticides allowed farmers (and corporations) to plant larger sections of land. This trend, ultimately, significantly increased the need for larger grain elevators along the Colorado plains.

> The introduction of high-yielding [grain] varieties and the increased use of fertilizers, pesticides, and herbicides created another jump in productivity per acre in the post-World War II period. The same amount of land, operated by one-fourth as many farmers, may be five times more productive today than it was a century ago. One result, of course, is that grain elevators have had to expand in size to keep pace with this increased output… (Gohlke 1992)

Large trucks began moving grain from farmer to market at a greater pace during growing seasons. Unfortunately, the small country elevators could not keep pace with the demands. Part of the problem was truck queues at smaller elevators were long as a result of insufficient capacity to handle the larger size of loads and the frequency at which grain would be delivered. Distance was no longer a concern when an elevator with greater capacity could be located as little as ten to 20 miles away (Bouland 1967). Small country grain elevators were often unable to accommodate larger trucks and also lacked the capacity for long-term grain storage. Railroads discontinued service and abandoned lines that did not provide consistent business (For additional information, see page 36 for the section on *Transportation*). While not all country elevators fell into disuse, many were abandoned between the 1930s and 1950s.

Dry land farming still occurs on the Colorado Plains today. Winter wheat, which relies on the greater moisture available during months of snowfall, is often very successful. Some farmers have turned to highly drought resistant crops such as millet and sunflower seeds. In fact, the birdseed industry has resurrected many smaller elevator operations, proving to be a more profitable product than wheat. Corn, an irrigated crop, has increased in production with the recent advent of bio fuels, however, many of these producers have their own elevators and receive shipments directly instead of through an elevator terminal.

As demonstrated by history, the grain elevator industry is largely dependent on cycles in farming. Cyclical changes in weather and market conditions have resulted in the abandonment of many elevators while spurring the expansion of others. Some have remained in commercial use, while others have been purchased by individual ranchers who use them to store feed grain for their herds. Many operators have switched from cereal grains to other products such as birdseed and feed products. Most of the abandoned elevators on the Great Plains are associated with abandoned rail lines, often a result of the increases in truck delivery to larger elevator operations. It is unfortunate these elevators were unable to compete with larger operations. Due to community size, availability of funds, and the difficulty of reuse due to construction methods, many of these elevators are now sitting derelict.

RAILROAD TRANSPORTATION

In the 1860s the Union Pacific Railroad selected a route through Wyoming for its leg of the Transcontinental Railroad, boosting Cheyenne's prospects as the major supply destination for the Rocky Mountain West. Leaders in Denver immediately explored a route linking the city directly to Cheyenne. Golden too built a route towards the north to connect to the transcontinental route. By 1870 Denver was connected via rail to both the west and east coasts. The Kansas Pacific (formerly the Union Pacific Eastern Division) arrived in Denver from the east just months later, adding additional routes The primary mission of these early railroads was to connect the rich mining areas of Colorado to the East, not to encourage farming on the arid plains. While the farming activities were important in providing supplies for miners, the purpose of the railroads focused on the miners and not on farming (Abbott, Leonard et al. 1982). However, early rail lines ran close enough to river routes that small farming communities began to spring up along the routes.

It is a myth to consider railroads civilizing agents. While they did bring people to an area, their motive was hardly altruistic (Gohlke 1992). Mining gave them a reason to develop lines in Colorado; farming gave them a reason to create new routes.

> When enough of them [homesteaders] had arrived to constitute a potential pool of grain shippers, railroads sent field engineers into the territory to collect data on the people and the land they had started to farm and then made cost and revenue projections, much in the manner in which shopping center locations are determined in cities today. New lines of track were extended if enough business was to be had, and construction was hastened if it appeared to one railroad president as though another had designs on the same territory. (Gohlke 1992)

Railroads made it possible for Colorado farmers to become competitive in the grain market. Farmers, however, were only as successful as their distance from the rail line. Farms ten miles away from the nearest rail line could succeed as competitive grain producers, while those 30 miles away could not count on grain being a primary source of income (Gohlke 1992).

Railroads were instrumental in developing towns along their routes, allowing them to control both shipping and passenger traffic. "As a further anchor on farmers' trading habits, railroads entered the townsite business by platting trade-center towns adjacent to virtually every location where they decided to locate a sidetrack that would serve an elevator" (Gohlke 1992). Essentially, railroad companies functioned as real estate agents, receiving not only land for their rail lines but also adjacent government land grants on which they platted towns. As stated earlier, towns were spaced in such a way as to make it convenient for both the railroad and the farmer.

The grain elevator and the depot were among the first buildings constructed in towns spurred by rail development. Such towns generally formed on a grid pattern and the platting of the town was done in relationship to the elevator and depot, usually located on the edge of the community. "Towns were oriented either in accordance with the land survey grid or along the axis of the railroad, depending primarily on whether the town formed before or after the railroad" (Mahar-Keplinger 1993). Railroads had to be very aware of the layout of existing towns so they would put their track on the fringe when possible, ensuring that the elevator was not in the center of town.

“At first the railroad financed country elevators, but this practice was restricted in the 1870s by government regulation” (Selyem, 2000). As a result railroads did not finance country grain elevators in Colorado, even though they had substantial influence on their locations. Railroads leased instead of sold the land to the operators, giving them considerable sway over elevator operations and control of competition (Gohlke 1992).

Having established lines into Colorado, railroads began encouraging immigration and becoming strong advocates for dry land farming across the Great Plains. Their influence included support of legislation advantageous for dry land farming and the promotion of funding for research of cultivation techniques and crop development. The railroads realized supporting these efforts served their interests in attracting more people to the dry plains. Railroad companies were involved in the distribution of propaganda touting the rich farmlands of the plains in an effort to increase population in areas where they wished to expand their operations. Farmers, tempted by the free land and the promise of profits from dry farming, moved into these areas only to come to the harsh realization that farming the semi-arid desert was unpredictable and often unprofitable.

Between World War I and II, the relationship between railroads and grain elevators changed. The stock market crash, declines in grain prices, droughts, and lack of production resulted in many railroad companies entering into bankruptcy, which eventually led to the abandonment of rail lines. A great deal of land was taken out of grain production during the drought of the 1930s. The grain industry did not recover until the entry of the United States into World War II. The droughts were over and the need for grain was great, not only in the United States but also around the world.

Changes in transportation and farm mechanization following World War II substantially affected both the railroad industry and farming in the American West. During the late 1940s and 1950s in-land trucking rates became more reasonable and the new network of interstate highways made truck transportation increasingly accessible. For farmers, mechanized plows and harvesters, more sophisticated irrigation systems, and fertilizers and pesticides resulted in greater crop variety and fostered the emergence of larger single family or corporate operations. Quite simply, fewer farmers began producing more grain. The combination of more affordable trucking and greater grain production allowed grain elevators to be spaced further apart and created a need for facilities with larger storage capacities.

One of the primary advantages of increased storage capacity was the stabilization of grain pricing. Grain could now gradually enter the market as needed, not all at once when crops were delivered. Smaller elevators that could neither provide long term storage nor turn large capacities simply could not compete.

As a result, railroad companies had to make difficult decisions regarding which lines to keep active and which to abandon. Locations of major trucking routes certainly influenced railroad decisions regarding which lines to discontinue. In turn, the abandonment of rail lines influenced the survivability of not only numerous trackside towns but also the country grain elevators located in those communities. Many grain elevators fell into disuse and the associated communities became virtual ghost towns.

The Staggers Rail Act of 1980 allowed railroad companies to contract directly with grain shippers. The resulting "destination contracts" caused an increase in grain prices. "Destination contracts – contracts between railroads and large grain buyers – have been shown to result in higher farm prices because buyers pass part of their rail rate savings on in the form of higher bids" (Hanson, Baumhover et al. 1990). While the Staggers Act provided benefits to the railroads, in-land terminal elevators, and farmers, the legislation did not necessarily benefit the smaller operators whose capacities made it difficult to compete with bulk purchasing that resulted from destination contracts.

TRUCKING

Railroad freight transportation continued its dominance until the 1920s and 1930s when the gasoline powered engine and the gradual but widespread paving of state highways began to make it advantageous to transport goods via trucking lines instead of rail (Weingroff 1996). Many farmers, particularly those who could afford the purchase of both mechanized farm equipment and trucks to transport their grains to the elevators, enjoyed increased flexibility in the distribution and transportation of their grain products during this time. With a truck, a farmer could travel farther and bring in more grain per day from the field to the elevator than under the horse and cart system. If the price was not favorable at one elevator, it was just a matter of driving six to ten miles down the road to the next. The larger number of trucks bringing grain to the elevators created a new challenge to the grain elevator industry: truck queues. The speed at which farmers could deliver their product, the increased size of vehicles, and larger crop yields all made it difficult for the small wood country grain elevators to survive. Since the six to ten mile rule was no longer a limiting factor and the capacity of the elevators was insufficient to meet new demand, an increasing number of Farmers' Co-ops and elevator operators began constructing slip-form concrete elevators with greater capacity. While smaller than in-land terminal elevators, these larger cousins of the wood country elevator helped solve issues of capacity and truck wait times, thus increasing efficiency in the transportation of grains.

In 1954, Dwight D. Eisenhower signed the Federal-Aid Highway Act that provided funding to states for the interstate highway system. With the federal funds the network of paved roads improved and grain transportation became easier. The interstate highway system allowed trucks to travel further to larger elevators with more favorable prices, exerting further pressure on rail transportation. Because smaller elevators lacked the ability to serve large trucks and handle increased volumes in crop production, it became cheaper for the railroad companies to make fewer stops at larger elevators and many lines or stops were abandoned. These changes contributed to the demise of many of the country elevators.

INDUSTRIES

Colorado grain farmers have long supplied a variety of industries. These include flour milling, beer brewing, and animal feed companies. While the flour milling industry in Colorado has diminished, the brewing and feed industries continue to thrive.

Flour Milling

Flour milling was once the premier industry for the grain producers of Colorado. Flour milling got its start in southern Colorado with gristmills, which used hard stones to grind the available grain. These mills initially supported needs of early trappers, miners, and the established populations in northern New Mexico and southern Colorado. Ongoing increases in Colorado's mining population spurred growth in both local railroads and flour milling activities. By the mid-1870s, Golden, Boulder, Littleton, Loveland, Berthoud, Denver, and others boasted flourmills (Reich 2008).

J.K. Mullen, future Colorado flour magnate, arrived in Denver in 1871 and by 1880 was the area's leader in the flour milling industry. He owned the Excelsior Mill in Denver plus several grain elevators, additional mills, and wheat fields throughout the Eastern Plains and Northern Front Range. Mullen was responsible for bringing to Colorado the Hungarian milling process, a competing method to the gristmill process, which used rollers to grind grain. He also was instrumental in creating high altitude flour, a product made from the hard winter wheat grown on the dry plains (Reich 2008).

In 1885 leaders in the milling industry recognized a need to stabilize otherwise unpredictable flour prices. The Colorado Milling and Elevator Company (CM&E) was a trust established for that purpose. Millers in Denver, Fort Collins, Golden, Greeley, and Longmont joined the trust and elected J.K. Mullen as its general manager. This action increased Mullen's power in the milling industry and succeeded in stabilizing prices (Convery 2000).

Mullen continued to expand the CM&E through the purchase of existing mills and the opening of new mills and elevators throughout the state. In an effort to placate suspicious farmers who felt CM&E was a monopoly guilty of price fixing, Mullen looked for ways to improve CM&E's image. "J.K. instituted several measures designed to reestablish trust in his company. In order to provide a sense of local ownership, subsidiary mills acquired or opened by CM&E were named for the community (e.g. La Junta Milling and Elevator Company, Alamosa Milling and Elevator Company" (Convery 2000). In the end Mullen's efforts did not placate the farmers, who began to look for ways to compete with CM&E.

> The Farmer's Co-Operative and Educational Union erected a competitive mill at Milliken, planned another in Longmont, and opened thirty-six elevators statewide. Co-op spokesman Dr. William R. Collicott denounced the 'Mullen mills …practice of purchasing cracked and shriveled wheat from farmers at the lowest possible price [and] later dispos[ing of it] at the prices of a No. 1 wheat." (Convery 2000)

At the height of J.K. Mullen's flour empire, Colorado was one of the leading manufacturers of flour products in the Rocky Mountains. However, by the 1920s corporate agribusiness began to change both the farming and milling industries and by the late 1930s the majority of CM&E was sold. Again, changes in transportation, farming technology, and corporate competition led to the merging of processing industries. By the late 1960s the flour milling industry was substantially smaller with many mills abandoned or demolished (Convery 2000). Today the primary miller of flour in the state is the Consolidated Agriculture Company, commonly referred to as Conagra Foods.

Figure 20: Pueblo Flour Mill, Pueblo, Colorado, University of Colorado Denver

Brewing

During the Colorado Gold Rush beer, perhaps considered by miners to be a necessity on par with flour, was in great demand but difficult to obtain because its great weight made transportation from the Midwest problematic. The solution was to establish local breweries to meet the demand.

While some grains could be grown locally, key ingredients such as hops and barley were imported from St. Louis, Missouri, and Leavenworth, Kansas. Fred Salomon and his partner Charles Tasher purchased carloads of hops from John P. Good, an active supplier, for their Rocky Mountain Brewery, Denver's first such venture in 1859. Eventually, Good became the sole owner of the operation, selling the product to all saloon owners in Denver. Good brought in Phillip Zang to manage the operation while he focused on developing the market in Leadville. Later Zang purchased the brewery and renamed it after himself, Zang Brewery. Good purchased a failing brewery operation in Denver, which he renamed the Tivoli (Reich 2008).

Prior to the mid-19th century, beer was a substitute for drinking water in many cultures. The process of making beer eliminated impurities that caused illness. Colorado was no exception for the need to provide an alternative beverage to poor quality drinking water. Thus, as the population grew, so did the demand for beer. In 1873, Adolph Coors arrived in Golden, building what became the best known and longest operating brewery in the state. Zang, Tivoli, and Coors, however, were not the only breweries to meet the demand for beer. Breweries were established in other towns including Leadville, Trinidad, Boulder, Silverton, Gunnison, Lake City, and Howardsville (Reich 2008).

Brewing and beer consumption faced challenges when Colorado women campaigned for prohibition. Colorado prohibition began in 1915, with the nationwide prohibition starting in 1920. During this time a number of breweries struggled. Coors came up with the novel idea of producing malt products, such as malted milk, to keep their franchise in operation during prohibition. When prohibition was repealed in 1933, Coors was poised to reestablish its brewing business.

Coors' success is partially attributable to the fact the company owns its own fields and grain elevators, thus eliminating both the farmer and the intermediary and delivering grain products directly to the brewery. Large elevators constructed at the brewery accommodated the transfer and storage of grain and provided easy access to grain for brewing.

Figure 21: Coors Brewery Elevator, Golden, Colorado, University of Colorado Denver

Coors remained the single largest brewer in the state until the arrival of Anheuser-Busch in 1991. Since the 1980s, numerous microbreweries have developed across the state, providing the public with hand-crafted specialty products for the beer connoisseur. These products became popular beyond the state's border and can be found in many bars and pubs. With Anheuser-Busch in the mix, Colorado became the leader in brewing in the United States.

A strong brewing industry has been beneficial to farmers and elevator operators. While large brewers Coors and Anheuser-Busch (which also owns its own fields and elevators) are quite self-sufficient, most of the local micro-breweries rely on grain products that circulate from the elevator operations located throughout Colorado.

Feed

Supplying grains for feed products is important to not only farmers selling their crops but also farmers and ranchers operating livestock operations. Elevators, with their easy access to transportation routes, were convenient distribution points for feed products. Some of the elevators mixed feed products on site. Often an elevator would be a feed dealer for a specific feed company, with Purina Mills dominating those relationships. A number of feed products, including large animal and small animal feed and birdseed, were and still are produced in the state. Farmers and ranchers often purchased abandoned elevators to store grain for their own needs.

Two of the primary feed product producers in Colorado are Purina Mills and Mana Pro. Purina is well known for its small animal divisions such as cat and dog food but also produces a variety of products including large animal feed, fish food, and wild bird products. Purina contracts with elevator operators and mills to distribute products and purchase raw materials. It is a significant end user manufacturer in the state, with a plant located in Denver.

Figure 22: Purina Mills, Denver, CO, University of Colorado Denver

The second major feed producer is Mana Pro. Located near the Purina plant in Denver, the corporation is primarily known for its livestock, poultry, and small animal (particularly calf feed) products. Mana Pro was once a division of Carnation Milling, the developer of the well-known calf feed product. Mana Pro is another important end user of Colorado grain products transported through grain elevators. These industries remain an important outlet for farmers.

Wild and domestic birdseed is also an important industry, particularly for the owners of smaller elevators. As stated earlier, small elevators cannot compete with the grain volumes larger elevators carry. Many of them have turned to birdseed products such as sunflower, cracked corn, and millet. Sunflowers are particularly well suited, as native plants, for growing in our semi-arid plains. More farms are turning to the production of sunflowers to meet the need in both the birdseed and human (seed consumption and cooking oil production) markets. This decision among farmers to grow sunflower seeds has created a very competive and profitable environment for owners of small elevators, keeping many of them in operation.

Figure 23: Watkins Grain Elevator. Once a wheat operation, they now work with birdseed products such as millet and sunflower seeds. University of Colorado Denver

Ownership

Early in agricultural history, the farmer had no way to store his grain long term and had no choice but to take it to the nearest grain elevator once it was harvested. It was the responsibility of the elevator operator to get the product to market. This system was a disadvantage to farmers as they were at the mercy of the operator.

> Whether the farmer had a poor crop or a good one that year, in terms of either yield or grade, was of no consequence in the transaction. The grain collection system [railroad, commodity intermediary and elevator] was always paid before the farmer was because the transportation and handling costs were subtracted before any money changed hands. (Gohlke 1992)

Since the farmer was paid last, often the railroad, commodity intermediaries, and operators were the only ones to make a profit. Once multiple elevators were located within transportation distance, the farmer could shop his grain to competitors. Still, he was at the mercy of the same system.

The system of getting grain to market included a variety of owner types that developed over time, but eventually overlapped in terms of services provided. The major owner types include independent, line, corporate, and finally, the Farmers' Co-operative and Education Union.

Private

Private ownership applies to individually owned country elevators. Usually these owners had one or at most a handful of elevators. Because of the small size of their operations, they did not carry enough grain to get favorable railroad contracts and they lacked the collective volume to sell product directly in the commodities market. These private elevator owners were at the mercy of intermediaries to handle grain sales, a cost again passed on to the operator and then to the farmer (Refsell 1914).

Generally, an independent operator owned just a single elevator that served a town along a rail line. The primary advantage of working with the independent operator was location, a day's travel from field to elevator. A primary disadvantage to working with independent owners was the transfer of transportation costs on to the farmer, lowering their profits. A lack of competition was another disadvantage to farmers as the operator had no motivation to adjust grain prices other than what the commodities market railroad rates dictated. The operator often put their profit first over the farmer (Refsell 1914).

Line Operators

Line operators are those companies that own a chain of grain elevators typically located along a single rail line that linked them to the terminal or grain processor (Refsell 1914). Line operators would generally hire the same contractors and use the same blueprints along the line, creating a distinct visual identity and standardized capacities. The number of elevators on a line was directly related to the average yields from the surrounding farms (Gohlke 1992).

While the railroads rarely owned a line chain, they did seek to control them through land leases and transportation rates. The railroads encouraged multiple line operators, and in return for exclusive rights, the chain received highly favorable transportation rates. Since the railroads set transportation prices, they could be certain they would make a profit. Because of the lower transportation costs and the ability to carry greater volumes as a single company, line operators had a greater profit margin which could be passed on to the farmer if they desired. This advantage made it very difficult for independent owners to compete, resulting in the closure of their business or often the sale to a line operator. Regardless of the yield or grade of crops delivered, the farmer was still at the mercy of the price set by operators (Golhke 1992).

Figure 24: Line Elevator, Bartlett Grain Company, Eads, Colorado, University of Colorado Denver. This is one of many elevators owned and operated along the same rail line by Bartlett Grain Company.

Figure 25: Line Elevator, Bartlett Grain Company, Walsh, Colorado, University of Colorado Denver

Corporate Operators

Eventually large corporations formed and began developing their own line operations. These corporate operators essentially functioned as both buyers and resellers of grain. The corporations were often grain processors themselves, allowing them access to control both grain and product prices. Nearly all of the corporations had board members associated with railroads in an effort to garner the most favorable transportation rates, shipping times, and in some cases, exclusive access to shipping for their operations. They built large facilities, in-land and export terminals, to store grain for future sale. If they needed to store grain in order to wait for market conditions to improve and prices to increase, they had the capacity to do so. By gaining complete control over the flow of grain to the market, corporations were able to fix grain prices to their advantage, impacting both the buyer and the farmer (Refsell 1914).

Like line operators, corporations had the capacity to hire the same contractors and use the same blueprints for each elevator. They also had the capacity to have each elevator individually designed to meet their needs in any given area. Yield, type of grain product, and desired storage capacity all influenced the size of corporate elevators.

Figure 26: Corporate Elevator, Commerce City Grain/ Conagra Foods, Commerce City, Colorado, University of Colorado Denver. The Colorado Milling and Elevator Company was a predecessor to Conagra.

Farmers' Co-operative and Educational Union

The Farmers' Co-operative and Educational Union (co-op, or co-operative) was a descendant of the earlier Farmers' Alliance and Grange movement of the mid-19th century, an organization which focused primarily on the social life of farmers and was minimally involved in Populist politics and lobbying for the passage of favorable farm legislation. Farmer participation in these organizations gradually decreased in the 1890s, primarily because of internal strife and poor management. The Farmer's Co-operative and Educational Union's mission was quite different, focusing on the prosperity of farmers, not their social life (Tucker 1947).

The unfair tactics of price fixing by grain buyers, corporate and line operators, and the railroads increasingly disillusioned rural farmers and, by the late 1800s, they began to establish local co-operatives. The early co-ops first appeared in poor agricultural areas in the South that could not survive under the corporate system. These co-operatives fought for new legislation to decrease private railroad and syndicate control of the grain market in favor of control from voter elected state-level control commissions (Frame 1990).

Figure 27: Roggen Elevator Co-op, Roggen, Colorado, University of Colorado Denver. The image is typical of the concrete Farmer's Cooperative Elevators across the Eastern Plains.

Eventually the co-op movement spread throughout the country and, in 1905, the frustrated Southern farmers who could not survive on the marginal grain prices paid by corporate operators established a national organization known as the Farmers' Co-operative and Educational Union. The organization was member based, with each farmer paying an initiation fee and modest monthly dues. This small financial commitment enabled even the poorest farmers to join a co-op. In return, farmers held a share in the co-op which would "…purchase their own grain and thereby assure themselves of a fair market price" (Refsell 1914). The state co-operative also helped local farmers lease or purchase sites for elevators. The railroads, with their interests in corporate operations, were reluctant to provide land to co-operatives. Fortunately, co-operatives were able to purchase elevators from failing independent and line operators.

As a member of a co-op the farmer was not restricted to selling only to the co-op elevator. The farmer could choose to sell his grain to either the co-op elevator or a competitor. However, if he sold his grain to a competitor, he would pay a penalty to the co-op (roughly the cost of grain handling) based on the number of bushels sold. This penalty kept the co-op in operation while still allowing the farmer to receive a competitive price (Refsell 1914). The co-operative movement continued to grow and by 1907 had thirteen state groups.

> The year 1909 was a turning point in the history of the Union. By the end of 1908, 17 State organizations had been chartered as follows: Texas, Arkansas, Georgia, Louisiana, and Alabama in 1905 or earlier; Mississippi, South Carolina, and Tennessee in 1906; Florida, Illinois, Kansas, Missouri, and Oklahoma in 1907; and Colorado, Kentucky, North Carolina and Washington in 1908. Twelve of these 17 are Southern States, while two oth ers are Border States. The influence of the Union was beginning to be felt in a small way in the Rocky Mountain Region and on the Pacific coast. (Tucker 1947)

By 1920 the co-operative began to dominate the national agricultural scene, handling more than fifty percent of grain, an amount which represented roughly the same volume line operator elevators handled (Frame 1990). The co-operatives, promoting anti-trust laws, put substantial pressure on the corporate and line operators.

In Colorado events associated with co-op development and growth were no different. For example, the co-ops began to erect both elevators and flourmills to compete with the behemoth corporate owner, Colorado Milling and Elevator Company (Convery 2000).

Anti-trust laws continued to evolve, providing co-ops with improved avenues for competition as well as fair rail rates and equal access to transportation. Line and corporate elevators continue to operate, but now on equal terms with the co-ops. Today, co-ops retain a philosophy of fair pricing for all.

Figure 28: Farmers' Co-operative Chain, Bennett, Colorado, University of Colorado Denver. This is an example of a line operation of Farmer's Co-operatives.

GUIDANCE FOR INTENSIVE LEVEL SURVEY & FURTHER INVESTIGATION

The grain elevator is a ubiquitous sight on the Colorado plains and a significant structure contributing to the understanding of farming activities in Colorado. Historically, grain elevators handled the flow of grain products into the market, acted as social centers for farmers, and were the iconic structure of many communities. These communities recognized the socio-economic value and importance of grain elevators, often erecting their own or making pleas to the grain industry to locate one in their town. The location of elevators on important rail routes often determined the distance between settlements. These rail lines not only distributed grain products but also delivered goods necessary to endure the difficult life of prairie settlers. Without grain elevators, few farmers would have been able to get their product to market.

It is difficult to assess fully the likely eligibility of the grain elevators along the Front Range and on the Eastern Plains without first conducting intensive level survey. The completed reconnaissance survey was a visual inspection only, therefore, only eligibility under Criterion C: Architecture/Engineering can be assessed at this time. Based upon the limited survey work it seems many of the grain elevators may be individually eligible for local, state or national designation or may be contributing resources within an agricultural historic district. The information below includes items to consider during any future intensive-level surveys of grain elevators. Future intensive surveys should use these terms as appropriate.

Resource Types: The National Park Service classifies grain elevators as structures. Ancillary resources associated with grain elevators, such as external silos and feed mixers are also categorized as structures. Office buildings and warehouses are categorized as buildings.

Significance: Evaluation for National Register eligibility may include not only the relationship of the grain elevator to the community, railroad, and surrounding farms but also its association with elevators along the same rail route. The grain elevator is a structure that evolved with improved engineering and construction techniques and for some eligibility criterion, it may be important to consider this progression of building materials and methods. In completing future intensive level surveys of grain elevators, it will be important to be aware of the possible benefits of archeological investigations. Archaeological remains such as foundations, elevator and farming equipment, and other cultural remnants are worthy of investigation for their potential to yield information about and enhance understanding of grain elevator history.

Level of Significance: National, state or local significance should be explored for all Colorado elevators and their sites. A comparative analysis with other elevators in similar regions or on the same rail lines may be part of determining the appropriate level of significance. It is most likely grain elevators have either state or local significance considering the national commonality of the building type and the similar role grain elevators played in local communities across the nation.

Period of Significance: For grain elevators, as with any surveyed site, the chosen period of significance should relate directly with the reason the resource is important. Individual property history and dates associated with themes covered in this context may affect the choice of appropriate periods of significance for intensively surveyed grain elevators.

Assessments of Integrity: Adaptations and additions to the grain elevator (and even movement of ancillary buildings) may be part of the development of a grain elevator complex, creating difficulties in determining the integrity. Therefore, evaluations of these properties should consider the fact that increasing capacity was often critical to the survival of a grain elevator operation and should not be seen as automatically diminishing historic integrity. Any alterations to surveyed grain elevators should be scrutinized in terms of all seven aspects of integrity. Based upon the reconnaissance survey and historic context work completed, the recommendation is future integrity assessments be flexible regarding such changes provided the original elevator is largely intact. In addition, the substantial differences in construction methods between the country grain elevators and the larger concrete and terminal elevators suggest integrity should be considered separately for distinct grain elevator subtypes.

Intensive survey will not only identify but also evaluate grain elevators. Such documentation is crucial for determining whether these resources are eligible to the National Register. There are certain benefits associated with such designation. Owners of listed grain elevators may be able to take advantage of tax credits or grant funding. While designating elevators as a collection of structures within an associated system (historic district) may be preferred, a case-by-case approach and individual listing may be required to garner owner support.

Preparation of this historic context involved researching and developing key themes associated with grain elevators along the Front Range on the Eastern Plains of Colorado. Supplemented with an explanation of property types and registration requirements, this context could be used to create a Multiple Property Document Form (MPDF). MPDFs represent important tools for facilitating the evaluation of eligibility for and, most importantly, nomination to the National Register. Preparation of an MPDF in the future may lead to more nominations of individual surveyed grain elevators. Such nominations may enhance the status of grain elevators as a recognized property type, providing overdue recognition for these common but valuable features of Colorado’s history and landscape.

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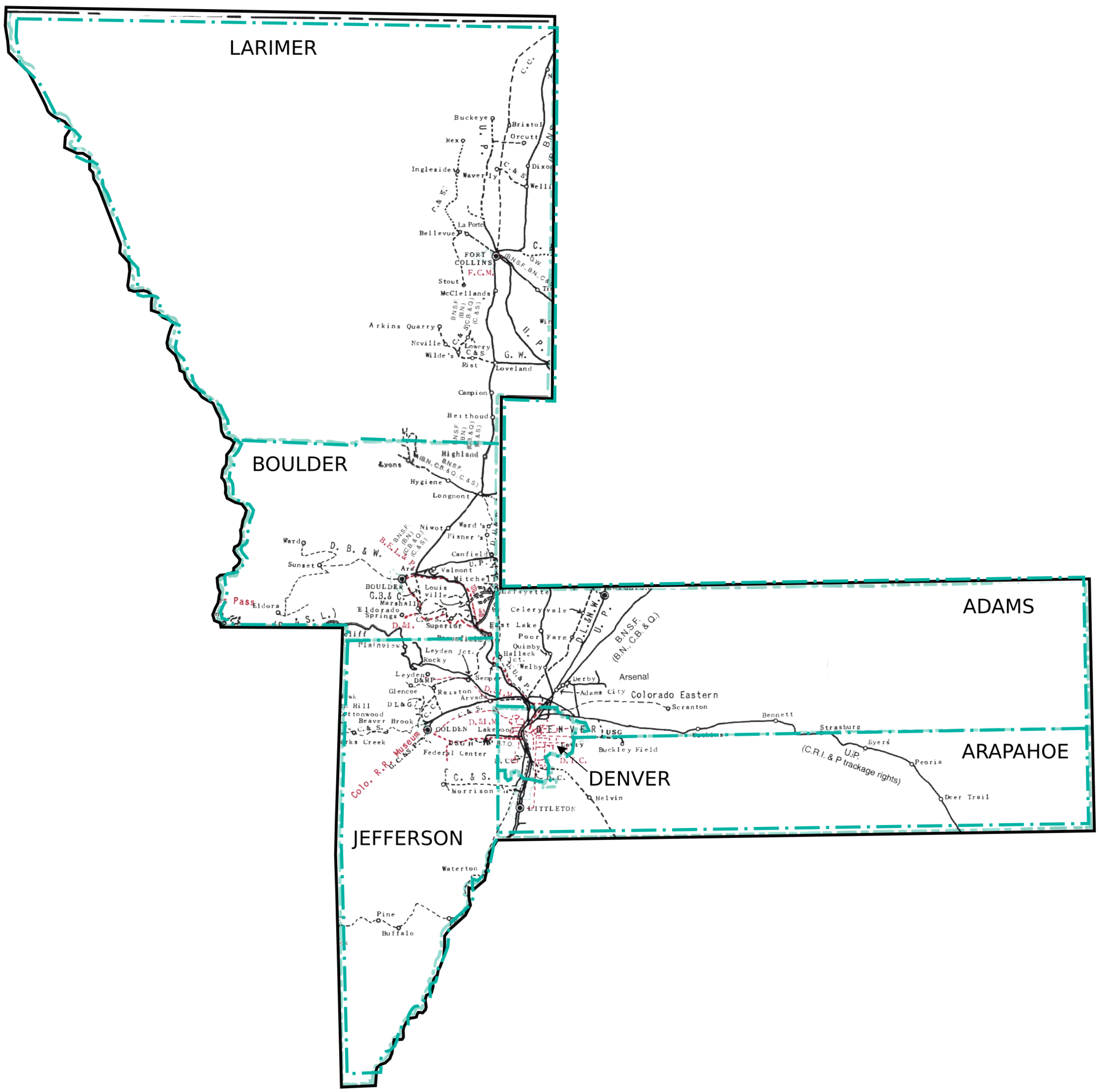
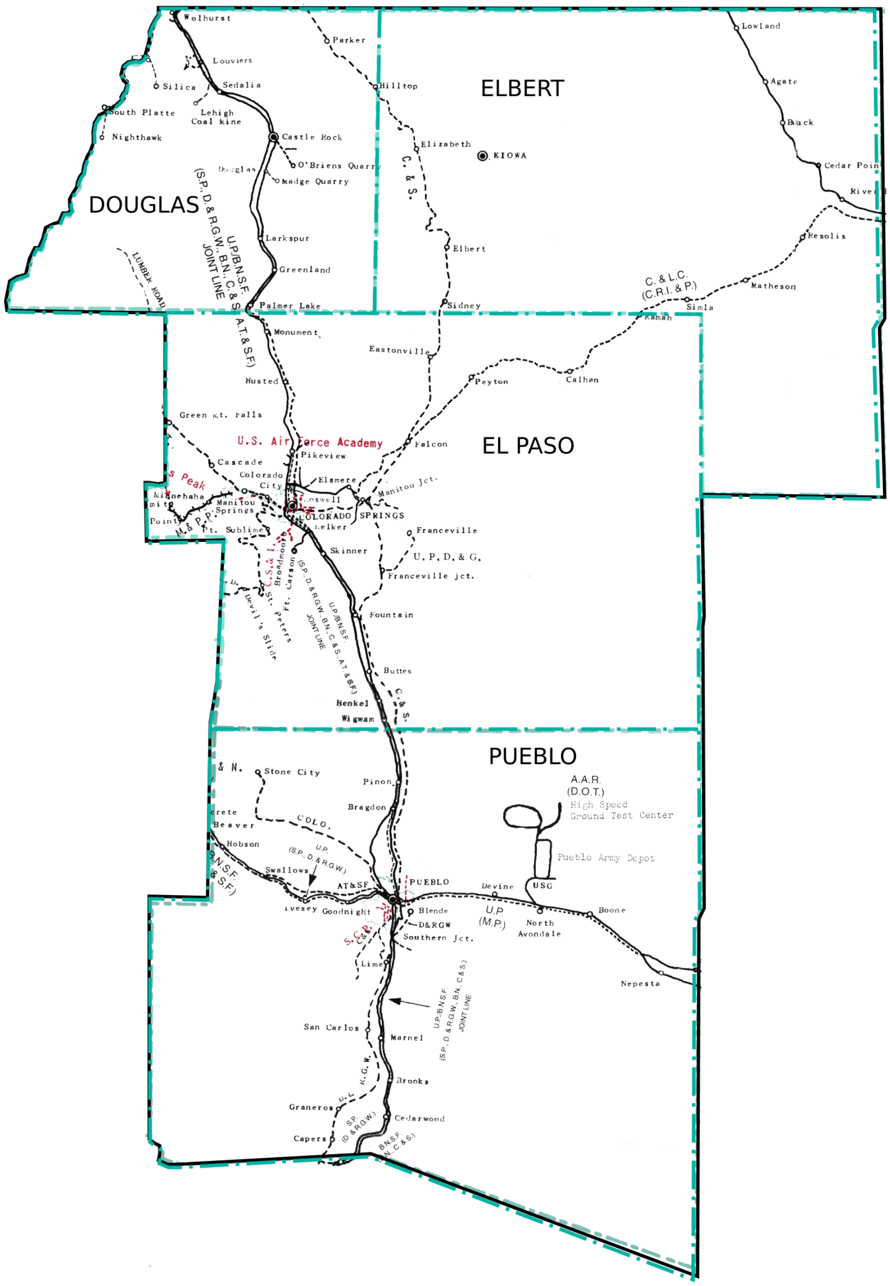
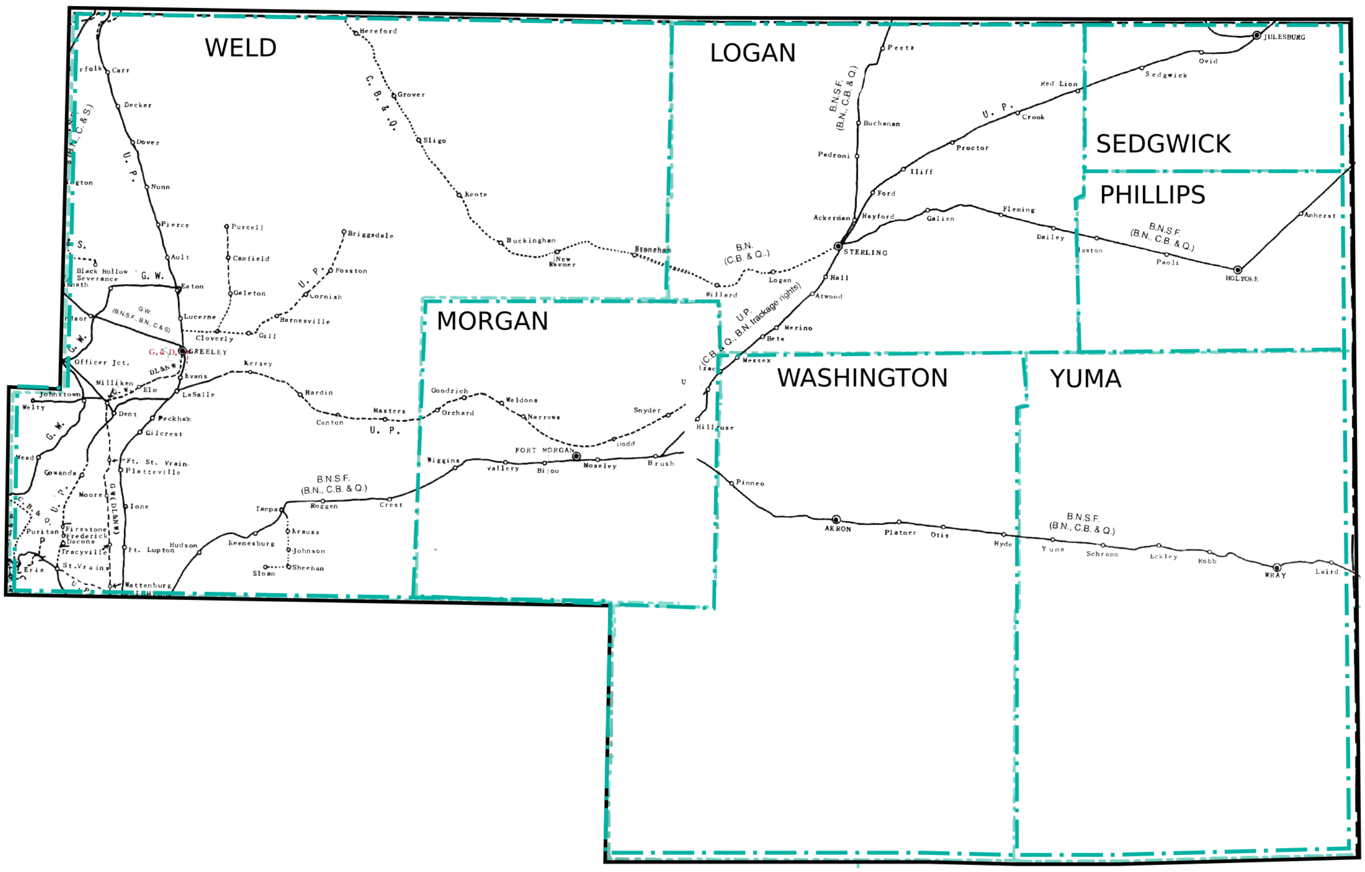
APPENDIX 1: MAPS OF SURVEY AREA



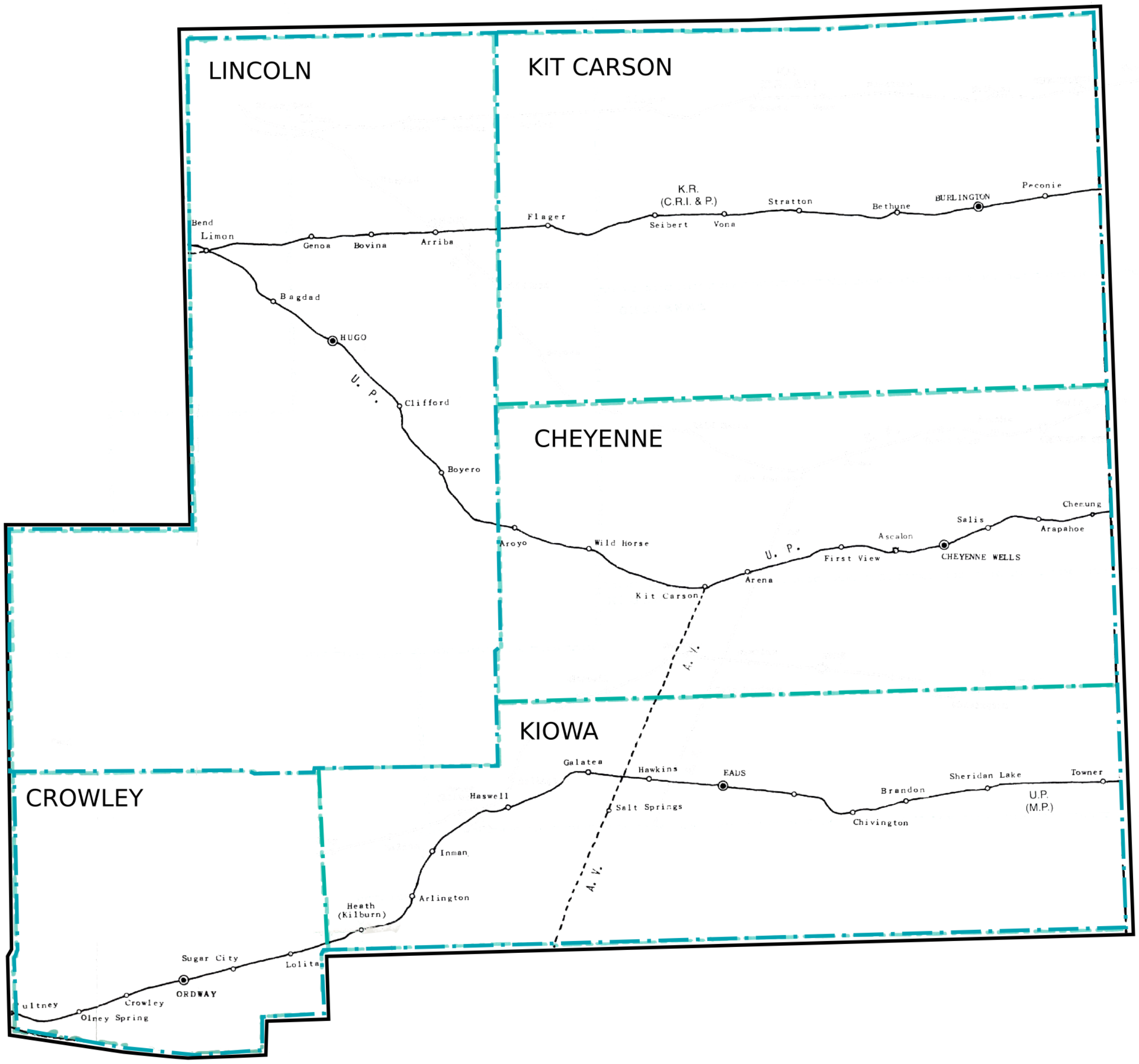
Northern Front Range: Larimer, Boulder, Jefferson, Denver, Adams, and Arapahoe counties (courtesy of the Colorado Railroad Museum)



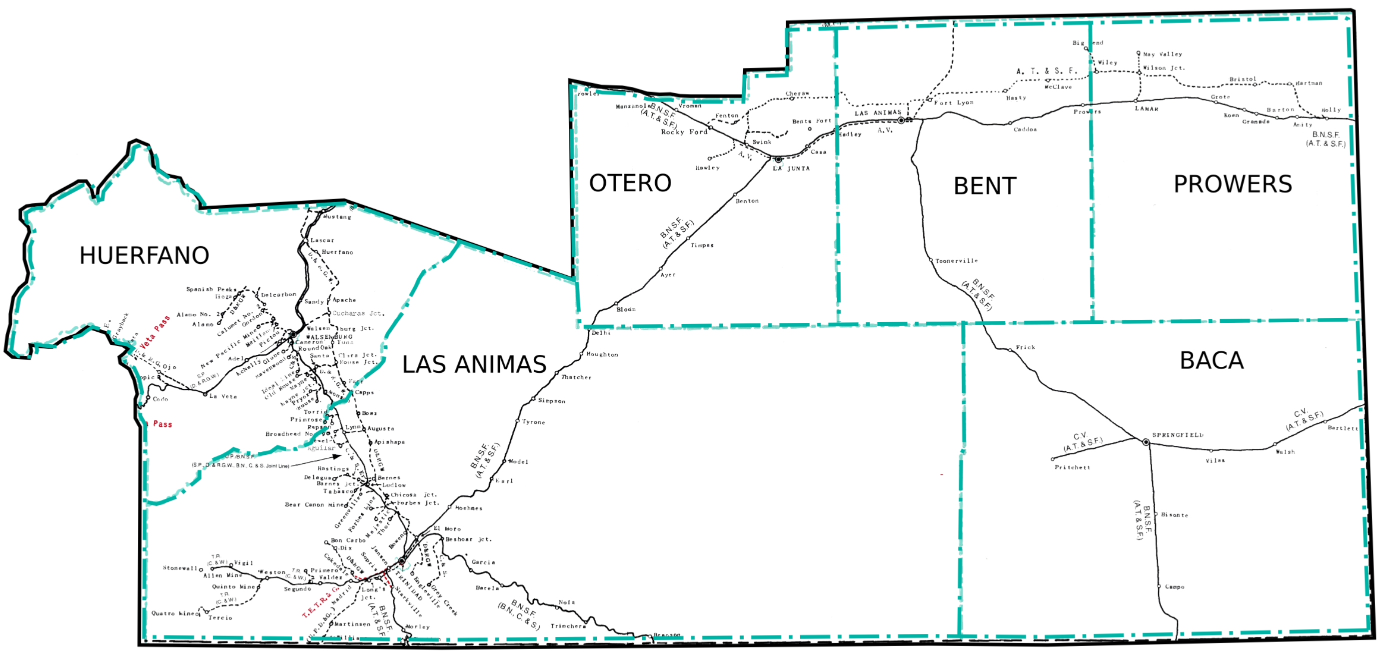
Southern Front Range: Elbert, El Paso, Douglas, and Pueblo counties (courtesy of the Colorado Railroad Museum)



Northeastern Colorado: Weld, Fort Morgan, Logan, Washington, Sedgwick, Phillips, and Yuma counties (courtesy of the Colorado Railroad Museum)



Eastern Colorado: Lincoln, Kit Carson, Cheyenne, Crowley, and Kiowa counties (courtesy of the Colorado Railroad Museum)



Southeastern Colorado: Huerfano, Otero, Las Animas, Bent, Prowers, and Baca counties (courtesy of the Colorado Railroad Museum). In this region, resources significantly west of I-25 were not investigated in detail.

APPENDIX 2: SUMMARY OF SURVEYED PROPERTIES

Reconnaissance Survey Summary
Eastern Plains and Front Range Grain Elevators of Colorado

County	Cribbed	Frame	Steel	Concrete	Feed Handling Centers	Mills/Feed Stores - Brick	Warehouse	Total
Adams	3	2	1	7	3			16
Arapahoe	1	1	2	2				6
Baca	2	2	3	9	1			17
Bent		1		2				3
Boulder	2	1						3
Broomfield	1		1					2
Cheyenne	1		3	3	2			9
Crowley				1				1
Denver				4				4
Douglas						1		1
El Paso		1						1
Elbert		3		1	1			5
Huerfano		1				1		2
Jefferson				2		1		3
Kiowa	2	1	1	6				10
Kit Carson	1	4	9	6	12			32
Larimer	4		1	3		3		11
Las Animas						1		1
Lincoln	1	4	1	3				9
Logan	2	8	10	4				24
Morgan		1	4	4	1			10
Otero	4	1	1				2	8
Phillips	6	3		9				18
Prowers	1	1	1	6	1			10
Pueblo						1		1
Sedgwick		2	1	3	1			7
Washington	2	4	9	2	6		1	24
Weld	18	8	8	12	8	1		55
Yuma	4	1	2	6	1	1		15
Total Elevators	55	50	58	95	37	10	3	308

Cribbed: Dominant building material of stacked wood lumber construction with metal siding
Frame: Dominant building material of wood in balloon frame construction with bracing and metal siding
Steel: Dominant building material of steel; includes steel tile (panel) and open leg units
Concrete: Dominant building material of concrete; includes both country and terminal elevators
Feed Handling Center: Dominant building material of steel silos grouped together with an elevator leg; can be corrugated, tile (panel) or plain sheet metal
Mills/Feed Stores: Dominant materials of wood and brick; functions are flour and feed mills, not grain storage
Warehouse: Dominant building materials of steel or wood; function as sorting area or additional storage

County	Town	Elevator Name	Type	Priority
Adams	Bennett	Roggen Farmers Elevator Assoc.-Bennett Elevator 1	Frame	High
Adams	Bennett	Roggen Farmers Elevator Assoc.-Bennett Elevator 2	Concrete	High
Adams	Bennett	Roggen Farmers Elevator Assoc.-Bennett Elevator 3	Concrete	High
Adams	Bennett	Roggen Farmers Elevator Assoc.-Feed Handling Center 1	Feed Handling Center	Low
Adams	Bennett	Roggen Farmers Elevator Assoc.-Feed Handling Center 2	Feed Handling Center	Low
Adams	Brighton	Brighton Grain Company	Cribbed	Medium
Adams	Commerce City	Commerce City Grain, LLC-Elevator 1	Concrete/Terminal	Low
Adams	Commerce City	Commerce City Grain, LLC-Elevator 2	Concrete/Terminal	Low
Adams	Commerce City	Commerce City Grain, LLC-Elevator 3-Union Equity	Concrete/Terminal	Low
Adams	Commerce City	Commerce City Grain, LLC-Elevator 4	Concrete/Terminal	Low
Adams	Strasburg	Strasburg Elevator 1	Cribbed	Medium
Adams	Strasburg	Strasburg Elevator 2	Cribbed	Medium
Adams	Strasburg	Strasburg Elevator 3	Steel Tile	Medium
Adams	Thornton	Eastlake Elevator	Frame	5AM.1445
Adams	Watkins	Watkins Grain Company-Watkins Elevator 1	Concrete	High
Adams	Watkins	Watkins Grain Company-Watkins Elevator 2	Feed Handling Center	Low
Arapahoe	Byers	Cargill- Byers Elevator 1	Steel Tile	Low
Arapahoe	Byers	Cargill- Byers Elevator 2	Concrete	Low
Arapahoe	Byers	Cargill- Byers Elevator 3	Concrete	Low
Arapahoe	Deer Trail	Deer Trail Elevator 1	Steel Tile	Medium
Arapahoe	Deer Trail	Deer Trail Elevator 2	Frame	High
Arapahoe	Littleton	The Mill Restaurant	Cribbed	Low
Baca	Bartlett	Bartlett Elevator 1	Concrete	Low
Baca	Bartlett	Bartlett Elevator 2	Steel Tile	Low
Baca	Campo	Campo Elevator 1	Cribbed	Low
Baca	Pritchett	Pritchett Elevator 1-Hart-Bartlett-Sturtevant Grain Co.	Frame	High
Baca	Pritchett	Pritchett Elevator 2	Concrete	Low
Baca	Pritchett	Pritchett Elevator 3-Gano/Co-op	Concrete	High
Baca	Pritchett	Pritchett Elevator 4	Concrete	Low
Baca	Springfield	Springfield Co-op Elevator 1	Concrete	Low
Baca	Springfield	Springfield Co-op Elevator 2	Concrete	Low
Baca	Vilas	Vilas Elevator 1	Cribbed	Low
Baca	Vilas	Vilas Elevator 2-Collingwood	Frame	Low
Baca	Vilas	Vilas Elevator 3	Steel	Low
Baca	Walsh	Baca County Feed yard	Feed Handling Center	Low
Baca	Walsh	Bartlett Grain Company, LP	Concrete	Low
Baca	Walsh	Colorado Gasohol Inc.	Concrete	High
Baca	Walsh	East of Walsh Elevator 1-Skyland Grain LLC	Concrete	Low

County	Town	Elevator Name	Type	Priority
Baca	Walsh	Walsh Elevator 1-Tempel Grain Co.	Steel Tile	Medium
Bent	Fort Lyon	Fort Lyon Elevator 1-Colorado Feeds, Inc	Concrete	Medium
Bent	Las Animas	Showalter Grain Company/Las Animas Milling & Elevator Company/Nutrena	Frame	Low
Bent	McClave	McClave Elevator 1-Coors Brewing Co.	Concrete	Medium
Boulder	Hygiene	Private farm near Hygiene	Frame	Medium
Boulder	Lafayette	Lafayette Feed Street Store	Cribbed	High
Boulder	Louisville	Louisville Mill	Cribbed	5BL.8929
Broomfield	Broomfield	Coors Brewing Co.	Cribbed	5BF.85
Broomfield	Broomfield	Zang Brewery Elevator	Steel Tile	5BF.180
Cheyenne	Cheyenne Wells	Cargill Grain Elevator- Cheyenne Wells Elevator 1	Steel Tile	Medium
Cheyenne	Cheyenne Wells	Cargill Grain Elevator- Cheyenne Wells Elevator 2	Steel Tile	Low
Cheyenne	Cheyenne Wells	Cargill Grain Elevator- Cheyenne Wells Elevator 3	Cribbed	Low
Cheyenne	Cheyenne Wells	Cargill Grain Elevator- Cheyenne Wells Elevator 4	Feed Handling Center	Low
Cheyenne	Cheyenne Wells	Cheyenne Wells Elevator 5 (Private)	Concrete	Low
Cheyenne	First View	First View Elevator 1	Concrete	Medium
Cheyenne	First View	First View Elevator 2	Feed Handling Center	Low
Cheyenne	Kit Carson	Kit Carson Elevator 1	Steel	High
Cheyenne	Kit Carson	Kit Carson Elevator 2	Concrete	Low
Crowley	Sugar City	Sugar City Elevator	Concrete	5CW.30.12
Denver	Denver	Cargill, Inc.	Concrete	Low
Denver	Denver	Giambrocco Food Service	Concrete	Low
Denver	Denver	Manna Pro Corporation	Concrete	Low
Denver	Denver	Ralston Purina	Concrete	Low
Douglas	Castle Rock	Castle Rock Feed and Supply Co.	Frame	High
El Paso	Calhan	Pikes Peak Co-op Elevator	Frame	Low
Elbert	Agate	Agate Elevator Company	Concrete	Low
Elbert	Agate	Agate Feed Handling Center	Feed Handling Center	Low
Elbert	Mathison	Mathison Elevator 1-Snell Grain & Feed	Frame	Medium
Elbert	Mathison	Mathison Elevator 2	Frame	5EL.267
Elbert	Simla	Isley Lumber & Coal Company	Frame	5EL.296
Huerfano	Walsenburg	Sporleder Feeds	Frame	Low
Huerfano	Walsenburg	Walsenburg Mill-Check R Mix Feeds	Feed Mill-Brick	Low
Jefferson	Arvada	Arvada Flour Mill	Mill-Frame	Low
Jefferson	Golden	Coors Brewery Plant Elevator 1	Concrete/Terminal	Low
Jefferson	Golden	Coors Brewery Plant Elevator 2	Concrete/Terminal	Low
Kiowa	Brandon	Brandon Elevator 1	Cribbed	5KW.52.51

County	Town	Elevator Name	Type	Priority
Kiowa	Brandon	Brandon Elevator 2	Concrete	5KW.52.7
Kiowa	Eads	Eads Elevator 1-Bartlett and Grain Co. Grain Elevator	Concrete	5KW.52.10
Kiowa	Haswell	Haswell Co-op Elevator 1-Tempel Grain Elevators, LLP	Concrete	Low
Kiowa	Haswell	Haswell Elevator 2	Cribbed	Medium
Kiowa	Sheridan Lake	Boulware Grain Co.	Frame	5KW.52.39
Kiowa	Sheridan Lake	Temple Grain Elevators, LLP/FarmCo. Inc. Elevator	Concrete	5KW.52.2
Kiowa	Towner	Towner Elevator 1	Steel	High
Kiowa	Towner	Towner Elevator 2-Bartlett Elevator	Concrete	Medium
Kiowa	Towner	Towner Elevator 3	Concrete	Low
Kit Carson	Bethune	Bethune Grain Company Elevator 1	Feed Handling Center	Low
Kit Carson	Bethune	Bethune Grain Company Elevator 2	Cribbed	Medium
Kit Carson	Bethune	Bethune Grain Company Elevator 3	Feed Handling Center	Low
Kit Carson	Bethune	Bethune Grain Company Elevator 4	Steel Tile	Low
Kit Carson	Bethune	Bethune Grain Company Elevator 5	Steel Tile	Low
Kit Carson	Burlington	Burlington Elevator 1	Feed Handling Center	Low
Kit Carson	Burlington	Burlington Elevator 10	Steel	Low
Kit Carson	Burlington	Burlington Elevator 11	Feed Handling Center	Low
Kit Carson	Burlington	Burlington Elevator 2	Feed Handling Center	Low
Kit Carson	Burlington	Burlington Elevator 3/Co-op	Concrete	Medium
Kit Carson	Burlington	Burlington Elevator 4/Co-op	Concrete/Terminal	Medium
Kit Carson	Burlington	Burlington Elevator 5/Co-op	Frame	High
Kit Carson	Burlington	Burlington Elevator 6	Frame	Low
Kit Carson	Burlington	Burlington Elevator 8/Co-op	Steel	Low
Kit Carson	Burlington	Burlington Elevator 9	Feed Handling Center	Low
Kit Carson	Burlington	Plains Grain Co./Burlington Equity Co-op Elevator 7	Concrete	High
Kit Carson	Flagler	Flagler Elevator 1	Steel Tile	High
Kit Carson	Flagler	Flagler Elevator 2/Equity Co-op	Steel	Medium
Kit Carson	Flagler	Flagler Elevator 3/Equity Co-op	Concrete/Terminal	Low
Kit Carson	Flagler	Flagler Elevator 4	Frame	High
Kit Carson	Flagler	Flagler Feed Handling Center 1	Feed Handling Center	Low
Kit Carson	Flagler	Flagler Feed Handling Center 2	Feed Handling Center	Low
Kit Carson	Seibert	Seibert Elevator 1/Equity Co-op	Concrete/Terminal	Low
Kit Carson	Siebert	Seibert Elevator 2	Concrete	Low
Kit Carson	Siebert	Seibert Elevator 3/Co-op	Feed Handling Center	Low
Kit Carson	Siebert	Seibert Elevator 4/Co-op	Steel	Low
Kit Carson	Stratton	Stratton Elevator 1/Equity Co-op	Steel Tile	Low
Kit Carson	Stratton	Stratton Elevator 2	Feed Handling Center	Low
Kit Carson	Vona	Vona Elevator 1	Steel Tile	Medium

County	Town	Elevator Name	Type	Priority
Kit Carson	Vona	Vona Elevator 2-Vona Grain Company	Frame	Medium
Kit Carson	Vona	Vona Elevator 3	Feed Handling Center	Low
Kit Carson	Vona	Vona Elevator 4	Feed Handling Center	Low
Larimer	Berthoud	Berthoud Elevator 1	Concrete	High
Larimer	Berthoud	Berthoud Elevator 2	Cribbed	High
Larimer	Buckeye	Buckeye Elevator 1-Horton Feedlot	Cribbed	Low
Larimer	Fort Collins	Budweiser Brewery	Concrete	Low
Larimer	Fort Collins	Feed Store-Fort Collins Elevator 3	Feed Store-Brick	Low
Larimer	Fort Collins	Harmony Mill	Mill-Brick	Inventoried
Larimer	Fort Collins	North Colorado Feeders Supply	Feed Store-Brick	Inventoried
Larimer	Fort Collins	Ranch-Way Feed Mills	Concrete	Medium
Larimer	Loveland	Loveland Feed & Grain Company	Frame and Brick	5LR.6671
Larimer	Unincorporated Larimer County	Zimmerman Elevator	Steel Tile	5LR.11408
Larimer	Wellington	Wellington Elevator 1	Cribbed	5LR.10439
Larimer	Wellington	Wellington Elevator 2-Heiden's Feed and Grain	Cribbed	Low
Las Animas	Trinidad	Marty Feeds	Cribbed	Medium
Lincoln	Arriba	Arriba Elevator 1-Arriba Grain, Inc	Concrete	Low
Lincoln	Arriba	Arriba Elevator 2-Snell Grain Company	Frame	Medium
Lincoln	Arriba	Arriba Elevator 3-Snell Grain Company	Frame	Low
Lincoln	Arriba	Arriba Elevator 4	Steel Tile	Low
Lincoln	Genoa	Collingwood Grain, Inc./Snell Grain Company	Concrete	5LN.433
Lincoln	Hugo	Hugo Elevator 1-Snell Grain Company	Frame	Low
Lincoln	Hugo	Hugo Elevator 2	Frame	Low
Lincoln	Limon	Limon Elevator 1	Cribbed	Low
Lincoln	Limon	Limon Elevator 2	Concrete	Low
Logan	Atwood	Atwood Elevator 1-Farmers Co-op Elevator	Concrete	Low
Logan	Atwood	Atwood Elevator 2-Lousberg Grain, LLC	Steel Feed Mill	Low
Logan	Dailey	Dailey Co-op Elevator 1	Steel Tile	Medium
Logan	Dailey	Dailey Co-op Elevator 2	Frame	Low
Logan	Fleming	Fleming Elevator 1	Cribbed	Low
Logan	Fleming	Fleming Elevator 2-Fleming Feed Mill	Steel Feed Mill	Low
Logan	Fleming	Fleming Elevator 3-Farmers Elevator Company/Grainland Co-op	Concrete	Low
Logan	Ford	Ford Elevator 1	Steel Tile	Medium
Logan	Hall	Hall Elevator 1	Frame	Low
Logan	Padroni	Padroni Farmers Co-op	Steel-Open Leg	Low
Logan	Peetz	Peetz Elevator 1-Peetz Farmers Co-op Elevator and Supply Company	Frame	High
Logan	Peetz	Peetz Elevator 2	Steel Tile	Low

County	Town	Elevator Name	Type	Priority
Logan	Sterling	Sterling Elevator 1-Cargill	Concrete	Low
Logan	Sterling	Sterling Elevator 2-Jochem	Frame	Medium
Logan	Sterling	Sterling Elevator 3-Lausberg Grain & Feed, Inc.	Cribbed	Low
Logan	Sterling	Sterling Elevator 4-Lebsack Seed & Feed	Frame	Medium
Logan	Sterling	Sterling Elevator 5-Mitchek Allen Feed & Grain	Concrete	Medium
Logan	Sterling	Sterling Elevator 6-Sterling Ethanol LLC	Steel-Open Leg	Low
Logan	Sterling	Sterling Elevator 7-The Scoular Company	Steel-Open Leg	Low
Logan	Sterling	Trinidad Benham Elevator 1	Steel	Low
Logan	Sterling	Trinidad Benham Elevator 2	Frame	Medium
Logan	Sterling	Trinidad Benham Elevator 3	Frame	Medium
Logan	Unincorporated Logan County	Cookley Cattle Company Elevator 1	Frame	Low
Logan	Unincorporated Logan County	Cookley Cattle Company Elevator 2	Steel-Open Leg	Low
Morgan	Brush	Brush Elevator 1-M&M Cooperative	Concrete	Low
Morgan	Brush	Brush Elevator 2	Steel Tile	Low
Morgan	Brush	Brush Elevator 3	Frame	Low
Morgan	Brush	Brush Elevator 4	Feed Handling Center	Low
Morgan	Fort Morgan	Fort Morgan Elevator 1	Concrete	Low
Morgan	Fort Morgan	Fort Morgan Elevator 2-Erker Grain Company	Concrete	Medium
Morgan	Wiggins	Wiggins Elevator 2	Concrete	Low
Morgan	Wiggins	Wiggins Elevator 3-Feed Mixing Facility	Steel	Low
Morgan	Wiggins	Wiggins Elevator 4-Co-op	Steel	Low
Morgan	Wiggins	Wiggins Elevator 5-South Platte Grain/Co-op and Beans	Steel Tile	Medium
Otero	Fowler	Fowler Elevator 1-Arkansas Valley Co-op Association	Frame	High
Otero	Fowler	Fowler Elevator 2	Steel	Low
Otero	La Junta	La Junta Elevator 1-La Junta Milling & Elevator Company	Cribbed	Medium
Otero	La Junta	La Junta Elevator 2-WW Feed & Supply	Cribbed	High
Otero	Manzanola	Manzanola Elevator 1	Frame Warehouse	Low
Otero	Manzanola	Manzanola Elevator 2-Manzanola Trading Company	Frame Warehouse	High
Otero	Rocky Ford	Rocky Ford Elevator 1-Heil Bean	Cribbed	Low
Otero	Rocky Ford	Rocky Ford Elevator 2-Heil Bean	Cribbed	High
Phillips	Amherst	Amherst Elevator 1	Frame	High
Phillips	Amherst	Amherst Elevator 2-Amherst Co-op Elevator, Inc.	Concrete/Terminal	Low
Phillips	Haxtun	Haxtun Elevator 1-Farmers Co-op Company	Concrete/Terminal	Low
Phillips	Haxtun	Haxtun Elevator 2	Cribbed	Medium
Phillips	Haxtun	Haxtun Elevator 3	Cribbed	High
Phillips	Haxtun	Haxtun Elevator 4-Commercial Grain Company	Concrete	High

County	Town	Elevator Name	Type	Priority
Phillips	Haxtun	Haxtun Elevator 5	Cribbed	Low
Phillips	Holyoke	Holyoke Elevator 1-Jack's Bean Company Elevator	Concrete	Low
Phillips	Holyoke	Holyoke Elevator 2-Jack's Bean Company Elevator	Concrete/Terminal	Low
Phillips	Holyoke	Holyoke Elevator 3-Reimer/Smith Grain Company/Holyoke Co-op Assoc.	Concrete/Terminal	High
Phillips	Holyoke	Holyoke Elevator 4-Reimer/Smith Grain Company/Holyoke Co-op Assoc.	Cribbed	High
Phillips	Holyoke	Holyoke Elevator 5-Reimer/Smith Grain Company/Holyoke Co-op Assoc.	Cribbed	High
Phillips	Holyoke	Holyoke Elevator 6-Reimer/Smith Grain Company/Holyoke Co-op Assoc.	Cribbed	High
Phillips	Paoli	Paoli Elevator 1-Paoli Farmers Co-op Elevator	Concrete	Medium
Phillips	Paoli	Paoli Elevator 2	Concrete	Medium
Phillips	Paoli	Paoli Elevator 3	Frame	High
Phillips	Paoli	Paoli Elevator 4	Frame	Low
Phillips	Paoli	Paoli Elevator 5	Concrete	Low
Prowers	Buckeye	Buckeye Elevator 1	Feed Handling Center	Low
Prowers	Granada	Granada Elevator 1-Southeastern Colorado Co-op	Concrete	High
Prowers	Holly	Holly Elevator 1-Southeastern Colorado Co-op	Concrete	Medium
Prowers	Holly	Holly Elevator 2-Johnson Co-op Feed Service	Cribbed	High
Prowers	Holly	Holly Elevator 3-Southeastern Colorado Co-op	Concrete	Medium
Prowers	Hwy 89	Prowers County Elevator	Frame	Medium
Prowers	Lamar	Lamar Elevator 1-Colorado Mills, LLC	Concrete	Low
Prowers	Lamar	Lamar Elevator 2-Southeast Colorado Co-op	Concrete	Low
Prowers	Lamar	Lamar Elevator 4-Co-op	Concrete	Low
Prowers	Lamar	Lamar Elevator 5-White Stone Farms	Steel	Low
Pueblo	Pueblo	Sweeny Feed Mill	Mill-Brick and Cribbed	Low
Sedgwick	Julesburg	Julesburg Elevator 1-Farmers Grain Company	Frame	High
Sedgwick	Julesburg	Julesburg Elevator 2-Farmers Grain Company	Concrete	Low
Sedgwick	Julesburg	Julesburg Elevator 3-Farmers Grain Company	Concrete	Low
Sedgwick	Ovid	Ovid Elevator 1	Frame	Low
Sedgwick	Ovid	Ovid Elevator 2	Steel	Low
Sedgwick	Ovid	Ovid Elevator 3-Kelley Bean Company, Inc	Feed Handling Center	Low
Sedgwick	Ovid	Ovid Elevator 4	Concrete	Medium
Washington	Akron	Hall Grain Elevator 1	Frame and Cribbed	High
Washington	Akron	Hall Grain Elevator 2	Steel-Open Leg	Low
Washington	Akron	Hall Grain Elevator 3	Cribbed	Low
Washington	Akron	Hall Grain Elevator 4	Steel	Low

County	Town	Elevator Name	Type	Priority
Washington	Akron	Hall Grain Elevator 5	Steel-Open Leg	Low
Washington	Akron	Hall Grain Elevator 6	Feed Handling Center	Low
Washington	Akron	M&M Co-op Elevator	Concrete	Low
Washington	Anton	Anton Co-op Assoc. Elevator 1	Steel Tile	Low
Washington	Anton	Anton Feed Handling Center 1	Feed Handling Center	Low
Washington	Anton	Anton Feed Handling Center 2	Feed Handling Center	Low
Washington	Cope	Cope Elevator 1	Steel Tile	Low
Washington	Cope	Cope Feed Handling Center	Feed Handling Center	Low
Washington	Hyde	M&M Co-op Elevator	Concrete	Low
Washington	Otis	Otis Elevator 1	Frame	Low
Washington	Otis	Otis Elevator 2	Frame warehouse	Low
Washington	Otis	Otis Elevator 3-Hall Grain Elevator	Steel	Low
Washington	Otis	Otis Elevator 4-M&M Co-op Elevator	Steel-Open Leg	Low
Washington	Otis	Otis Elevator 5-M&M Co-op Elevator	Steel-Open Leg	Low
Washington	Otis	Otis Elevator 6-Perry Brothers Seed	Frame	Low
Washington	Platner	Platner Elevator 1-Colorado Quality Grains	Cribbed	Medium
Washington	Platner	Platner Elevator 2-Colorado Quality Grains	Frame and Cribbed	Medium
Washington	Platner	Platner Elevator 3-Colorado Quality Grains	Steel	Low
Washington	Platner	Platner Elevator 4-Colorado Quality Grains	Feed Handling Center	Low
Washington	Platner	Platner Elevator 5-Colorado Quality Grains	Feed Handling Center	Low
Weld	Ault	Ault Elevator 1	Cribbed	Low
Weld	Ault	Ault Elevator 2-Highland Feed & Bean, Inc	Steel-Open Leg	Low
Weld	Briggsdale	Briggsdale Elevator 1-Briggsdale Grain, Inc	Steel-Open Leg	Low
Weld	Briggsdale	Briggsdale Elevator 2	Cribbed	High
Weld	Eaton	Eaton Elevator 1-Agland, Inc	Concrete	Medium
Weld	Eaton	Eaton Elevator 2	Frame	Medium
Weld	Eaton	Eaton Elevator 3	Feed Handling Center	Low
Weld	Erie	Erie Elevator 1	Frame	Low
Weld	Fort Lupton	Fort Lupton Feed Mill	Feed Handling Center	Low
Weld	Gilcrest	Gilcrest Elevator 1-Gilcrest Feed and Elevator	Frame	High
Weld	Gilcrest	Gilcrest Elevator 2-Paragon Bridge Works	Steel	Low
Weld	Greeley	Greeley Elevator 10-The Greeley Elevator	Feed Handling Center	Low
Weld	Greeley	Greeley Elevator 11-Trinidad Bean and Elevator Company	Cribbed	High
Weld	Greeley	Greeley Elevator 1-Colorado Commodity Traders, Inc	Feed Handling Center	Low
Weld	Greeley	Greeley Elevator 2	Frame	Low
Weld	Greeley	Greeley Elevator 3	Cribbed	Low
Weld	Greeley	Greeley Elevator 4-Buckboard Bean, Inc	Cribbed	High
Weld	Greeley	Greeley Elevator 5-Ranch-way Feeds	Cribbed	High

County	Town	Elevator Name	Type	Priority
Weld	Greeley	Greeley Elevator 6-The Greeley Elevator	Cribbed	Medium
Weld	Greeley	Greeley Elevator 7-The Greeley Elevator	Steel Tile	Medium
Weld	Greeley	Greeley Elevator 8-The Greeley Elevator	Cribbed	Medium
Weld	Greeley	Greeley Elevator 9-The Greeley Elevator	Cribbed	Medium
Weld	Grover	Grover Grain Elevator	Cribbed	5WL.2253 SR
Weld	Hereford	Hereford Grain Company	Concrete	Low
Weld	Hudson	Whip & Chip Feed and Supply	Feed Handling Center	Low
Weld	Johnstown	Johnstown Elevator 1	Concrete	High
Weld	Johnstown	Johnstown Elevator 2-American Pride Co-op	Steel-Open Leg	Low
Weld	Johnstown	Johnstown Elevator 3-Colorado Sweet Gold	Concrete	Low
Weld	Johnstown	Johnstown Elevator 4-Coors Moravian malting Barley/Johnstown Feed and Seed	Concrete	High
Weld	Keensburg	Keensburg Elevator 1	Cribbed	Low
Weld	Keensburg	Keensburg Elevator 2	Feed Handling Center	Low
Weld	Keensburg	Keensburg Elevator 3	Steel	Low
Weld	Kersey	Kersey Elevator	Concrete	High
Weld	La Salle	La Salle Elevator	Cribbed	High
Weld	Lucerne	Northern Feed & Bean	Concrete	High
Weld	Milliken	Milliken Elevator 1-Milliken Feeding Company	Frame	High
Weld	Milliken	Milliken Elevator 2-Milliken Feeding Company	Frame	High
Weld	Milliken	Milliken Elevator 3-Western International Grain Company	Steel Tile	Low
Weld	Nunn	Nunn Elevator 1	Steel Tile	Medium
Weld	Nunn	Nunn Elevator 2-Bellmore Farms	Concrete	High
Weld	Peckham	Weld Grain Co./Peckham Feed Elevator	Cribbed	High
Weld	Pierce	Pierce Elevator 1	Concrete	Medium
Weld	Pierce	Pierce Elevator 2	Feed Handling Center	Low
Weld	Pierce	Pierce Elevator 3	Cribbed	Medium
Weld	Pierce	Pierce Elevator 4	Cribbed	Low
Weld	Platteville	Rocky Mountain Flour Milling, LLC	Feed Handling Center	Low
Weld	Raymer	Raymer Elevator 1-Centennial Grain and Seed Ltd/McFeeders	Cribbed	High
Weld	Raymer	Raymer Elevator 2-Centennial Grain and Seed Ltd/McFeeders	Frame	High
Weld	Roggen	Roggen Elevator 1-Roggen Farmers Elevator Association	Concrete	Low
Weld	Roggen	Roggen Elevator 2-Roggen Northern Elevator	Cribbed	High
Weld	Stoneham	Lousberg Grain Company	Frame	High
Weld	Weld County	Northern Feed and Bean	Concrete	Low
Weld	Weld County	Sugar Beet Elevator	Concrete	Medium
Weld	Windsor	Windsor Flour Mill	Mill-Brick	Low
Yuma	Idalia	Idalia Agronomy Center/Co-op Elevator	Concrete	Low

County	Town	Elevator Name	Type	Priority
Yuma	Wray	Allen Grain, Inc	Concrete	Low
Yuma	Wray	Wray Elevator 1	Frame	High
Yuma	Wray	Wray Elevator 2	Cribbed	Medium
Yuma	Wray	Wray Elevator 3	Steel Feed Mill	Low
Yuma	Wray	Wray Elevator 4	Feed Handling Center	Medium
Yuma	Wray	Wray Elevator 5	Steel Tile	Low
Yuma	Yuma	Yuma Elevator 1	Concrete	Low
Yuma	Yuma	Yuma Elevator 2	Cribbed	Low
Yuma	Yuma	Yuma Elevator 3-Bartlett Grain Company, LP	Concrete	Medium
Yuma	Yuma	Yuma Elevator 4-Edible Bean Specialties, ADM	Cribbed	Medium
Yuma	Yuma	Yuma Elevator 5-Edible Bean Specialties, ADM	Cribbed	Medium
Yuma	Yuma	Yuma Elevator 6-M&M Co-op Elevator	Concrete/Terminal	Low
Yuma	Yuma	Yuma Elevator 7-M&M Co-op Elevator	Concrete	Low
Yuma	Yuma	Yuma Elevator 8-Yuma Farmers Milling-Mercantile Co-op Co.	Steel Warehouse	Low

Priority Levels

Low: Elevators that are rated in this category are concrete operating elevators that are in good condition. These elevators are not likely to be at risk in the near future. In addition, many abandoned elevators are marked low as they would receive little benefit from future designation. These resources should be inventoried as resources permit.

Medium: Elevators that are rated in this category are of all types and generally are in operation. There overall condition is fair to good and not likely to deteriorate further in the next five to eight years.

High: Elevators that are rated in this category are estimated to be pre-World War II construction, are still in operation and could benefit immediately from intensive survey and the results of designation. In addition, those elevators that may be abandoned but of unique construction were rated high. The resources should be inventoried in the next five years.

APPENDIX 3: RESEARCH GUIDE

LOCAL LIBRARIES, MUSEUMS AND ARCHIVES AND RESOURCES

Local libraries, museums and archives can be invaluable for resources, but differ in terms of the quality and the organization of their collections. Many libraries have online catalogs, however, the oldest material most likely will not be digitized. Local newspapers (some of which may be available through the Colorado Historical Society), photographs, family collections, oral histories, diaries, local government documents, books, and manuscripts are examples of materials found at these institutions. A number of these libraries, museums, and archives were visited during the course of this project.

Biographical Center for Research- Collaborative Digitization Program (BCR-CDP)
www.bcr.org/cdp/
Originally established as the Colorado Digitization Project in 1999, BCR-CDP works with local museums, archives and historical societies to provide access to digital records.

County Clerks and Recorders
County assessor and tax records are a primary source for grain elevator research, often providing dates of construction. They are a repository of land deeds. Many counties now have their records available online. Clerk and Recorders may choose to house their records (usually in a microfilm format) at the Colorado State Archives.

Prospector
prospector.coalliance.org
Prospector is an online searchable database of 23 member research libraries. The advantage of using Prospector is that you can search all 23 libraries simultaneously. You can access Prospector either through the web site above or from any of the sites of participating members. Prospector members are notated below. Gateways to Prospector are available through the individual institutions.:

Adams County Historical Society & Museum
Adams County Museum Complex
Adams County Regional Park
9601 Henderson Road
Brighton, Colorado 80601
303.659.7103
Fax: 303.659.7988
www.co.adams.co.us/index.cfm?d=standard&b=3&c=35&s=104&p=252

Aurora History Museum
15151 E. Alameda Parkway, First Floor
Aurora, CO 80012
(303) 739-6666
www.auroramuseum.org

Boulder History Museum
1206 Euclid Avenue
Boulder, CO 80302
(303) 449-3464
www.boulderhistorymuseum.org

Boulder Public Library - Carnegie Library (Prospector)
1125 Pine Street
Boulder, CO 80302
(303) 441-3110
www.boulder.lib.co.us
Collection includes several sources on grain elevators including oral histories and photographs.

Centennial Village Museum
City of Greeley Museums
714 8th Street
Greeley, CO 80631
Phone: (970) 350-9220
Fax: (970) 350-9570
www.greeleymuseums.com

City of Greeley Museums, Municipal Archives
714 8th Street
Greeley, CO 80631
Phone: (970) 350-9220
Fax: (970) 350-9570
www.greeleymuseums.com
Collections at this archive includes information on Weld Country and other areas of the plains region.

Colorado Railroad Museum
17155 West 44th Avenue
Golden, CO 80402
(800) 365-6263
www.coloradorailroadmuseum.org/library
The museum houses a library on railroad history including railroad maps and archival material associated with railroad companies.

Denver Public Library, Central Library, Western History Department (Prospector)
10 W. 14th Avenue Parkway
Denver, CO 80204
(720) 865-1111
history.denverlibrary.org
The Western History Department has one of the most extensive collections on Colorado history including books and documents on agriculture in Colorado. The collection includes journals, maps, Sanborn Fire Insurance maps and city directories. Some photographs are part of the *digital collection; however, the photo librarian should be consulted for additional images.*

Douglas County History Research Center
Douglas County Libraries
100 S. Wilcox
Castle Rock, CO 80104-1911
Phone: (303) 688-7730
Fax: (303) 688-7715
www.douglascountylibraries.org

Elbert County Museum
Elbert County Historical Society
P.O. Box 43,
Kiowa, CO 80117
Phone: (303) 621-2229
Fax: (303) 646-5683
www.elbertcountymuseum.org

Fort Morgan Museum
414 Main Street
P.O. Box 184
Fort Morgan, CO 80701
(970) 867-6331
www.ftmorganmus.org

Fort Sedgwick Historical Society
114 E. 1st
Julesburg, CO 80737
(970) 474-2061
users.kci.net/history/

Littleton Historical Museum
City of Littleton
2255 W. Berry Ave.
Littleton, CO 80165
Phone: (303) 795-3700
Fax: (303)795-3950
www.littletongov.org

Limon Heritage Museum and Railroad Park
Town of Limon
100 Civic Center Drive
Limon, CO 80828
www.townoflimon.com

Longmont Museum
400 Quail Road, Longmont, Colorado 80501
Phone: (303) 651-8374
Fax: (303) 651-0483
www.longmontmuseum.org

Louisville Historical Museum
1001 Main Street
Louisville, Colorado
(303) 665-9048
www.ci.louisville.co.us/museum.htm

Otero Museum
At the corner of Third and Anderson Streets
La Junta, CO 81050
(719) 384-7500
www.coloradoplains.com/otero/museum

Overland Trail Museum
210533 CR 26.5
Sterling, CO 80751
Phone: (970) 522-3895
www.sterlingcolo.com/pages/dept/plr/museum.php

Rio Grande County Museum
580 Oak Street
Del Norte, CO 81132
(719) 657-2847
www.museumtrail.com/RioGrandeCountyMuseum.asp

Southeastern Colorado Heritage Center
201 West B Street
Pueblo, CO 81003
(719) 295-1517
www.theheritagecenter.us

St. Vrain Historical Society
PO Box 705
Longmont, Colorado 80502-0705
Phone: (303)776-1870
Fax: (303)776-5778
www.stvrainhistoricalsociety.org

Wellington History Museum
3740 Cleveland Ave
Wellington, CO 80549
(970) 490-2137

Westminster Historical Society
City of Westminster
4800 West 92nd Avenue Westminster, CO 80031
Phone: (303) 658-2400
Fax: (303) 430-7929
www.ci.westminster.co.us/

Windsor Museum
110 North 5th Street
Windsor, CO 80550
(970) 686-2406
www.ci.windsor.co.us/index.aspx?NID=464

Wise Homestead Museum
Erie Historical Society
11611 Jasper Road,
Erie,CO 80516
Phone: (303) 828-4561
http://eriehistoricalsociety.org/

UNIVERSITIES AND COLLEGES

The college and university archives listed have records generally related to Colorado agricultural history. Resources such as books and journals may be duplicated among the institutions.

Colorado State University, Fort Collins (Prospector)
501 University Ave
Fort Collins, CO 80523
970-491-1842 Circulation
970-491-1841 Reference
lib.colostate.edu/
The collection includes numerous primary materials associated with agriculture in Colorado: photographs, maps, audio tapes (oral histories, meetings), reports and correspondence. There is some information on these collections through the university's online database. Collection materials are cataloged. Colorado State University has the records associated with the agriculture experimentation stations and the extension services.

University of Colorado, Boulder (Prospector)
1720 Pleasant St.
Boulder, CO 80309-0184
303-492-8705 Information
303-492-7477 Norlin, Circulation
303-492-7521 Reference
ucblibraries.colorado.edu
The university's Western Americana Collections is particularly useful for research of agriculture and associated communities. The Archives started in 1917 to collect manuscript material on the settlement and growth of Colorado. The collection includes diaries and papers of Colorado

settlers. The archives hold historical maps of varying types: railroad and trail maps, topographical maps, geological maps, mining maps, property maps and Sanborn fire insurance maps. Photographic sources include portraits, landscapes and urban scenes dating from the 1880s.

University of Northern Colorado Michener Library (Prospector)
20th Street and 14th Avenue
Greeley, CO 80639
970-351-2854 Archives and Special Collections
970-351-2671 Circulation
www.unco.edu/library/
The Michener Library is the sole repository for the James A. Michener Special Collection that includes all his research material on the history of northeastern Colorado used for the book Centennial. The Centennial collection is indexed (online, much of it annotated by Michener) and there is a dedicated archivist who works with the entire James A. Michener Special Collection. Photographs in the collection include a series Michener took of various areas of northeastern Colorado from 1936-1938. The Michener Library also has numerous sources on Colorado agriculture.

STATE COLLECTIONS

Colorado Historical Society
1300 Broadway
Denver, CO 80203
303-866-2305
www.coloradohistory.org/chs_library/library.htm
The Colorado Historical Society Stephen Hart Library is the official state repository for historical documents. The collection includes diaries, personal papers, books, newspapers (searchable online), manuscripts, government documents (Colorado State Archives holds the majority of state governmental records), and maps. Some of the collection material is unprocessed and may not be available to the public. The Colorado Historical Society has an online catalog available through their website.

Colorado Historical Society, Office of Archaeology and Historic Preservation
1300 Broadway
Denver, CO 80203
303-866-2711
www.coloradohistory-oahp.org/
The Office of Archaeology and Historic Preservation (OAHP) houses research materials specific to Colorado’s archaeological and built heritage. Materials include those produced through State Historical Fund grants. Information on surveyed and/or listed resources in State and National Register are available online through the Compass database.

Colorado State Archives
1313 Sherman Street, Room 1B20
Denver, CO 80203
303-866-2358

www.colorado.gov/dpa/doit/archives
The Colorado State Archives is the official state repository for legal, governmental and institutional documents. Not all records at the archives have been cataloged. An index to the collections is available on the website. Some collections are measured in cubic feet. One c.f. is equal to one standard file box. Records useful to researching grain elevators include patents, business incorporation records, local government records (including County Clerk and Recorder records), and state plan maps. The archives will allow access to unprocessed material.

FEDERAL LIBRARIES AND ARCHIVES

Federal Libraries and Archives located in the state have historic and scientific information associated with the mission of the given agency. Records may be located in Washington D.C. or housed at regional centers. The following agencies may have records useful to researching agricultural history and grain elevators. The libraries and archives may have limited hours or require an appointment.

Bureau of Land Management
National Science & Technology Center
Denver Federal Center, Bldg. 50
West 6th Avenue and Kipling
PO Box 25047
Denver, CO 80215
www.co.blm.gov
The BLM Library in Denver focuses on land management and natural resources, topics that may be valuable for both grain elevator and agriculture research. The BLM has over 40,000 volumes and over 250 periodical subscriptions in its collection. The Library of Congress Classification System is used for the records and can be accessed through the Online Computer Library Center, Inc. (OCLC). The online database of land patents/ homestead records is available at www.glorecords.blm.gov. Historic photographs are available at www.photos.blm.gov.

Bureau of Reclamation Library
Denver Federal Center, Bldg 67 Room 167
West 6th Avenue and Kipling
PO Box 25007,D-7925
Denver, CO 80225
303-445-2072
www.usbr.gov/library/
The United States Bureau of Reclamation (USBR) has reports, publications, maps, books, journals, and other resources, although not all of its collection material is available to the public and is reserved for the use of employees. In addition to the main branch in Denver, there are regional libraries that may have more localized information. All libraries are searchable from the same online database. Many of the materials date back to the late 19th century. Some materials are available only for USBR employees. The web site has links to the National Agriculture Library. The National Agriculture Library (www.nal.usda.gov) has links to several search engines (Agricola and Science.gov) that include reports and journals from a variety of government agencies.

National Archives, Denver Federal Center
Denver Federal Center, Bldg 48
West 6th Avenue and Kipling
PO Box 25307
Denver, CO 80225
303-407-5700
www.archives.gov/
The National Archives is the largest of the Denver-based federal archives and houses records from various agencies, primarily those associated with the western United States. Record types can be searched online. Pertinent agricultural records include:

- Federal Land records, dating back to the 1800s
- General Land Office records (predecessor to the Bureau of Land Management)
- Department of Agriculture records
- Bureau of Reclamation (USBR) 1887-1995. Collection includes maps, photographs and sketches
- Bureau of Land Management (BLM) 1854-1993. Collection includes district land office records (1860-1960), featuring title transfers from the federal government to entryman (person filing land claim), abstract books, administrative records, correspondence, cancelled land entry case files, serial registers and track books. State and regional office records (1946-1992). Farmers Home Administration (FHA) 1934-1946. Collection includes land records and documents associated with Depression era resettlement projects
- Forest Service (USFS) 1898-1995. Collection includes aerial photographs and maps for National Grasslands (reclaimed farm and ranching land)
- Soil Conservation Service (SCS) 1933-1971. Records are limited and complement those at the Colorado State Archives

ADDITIONAL SOURCES

This section details general sources useful in future research of individual grain elevators and associated communities. For the sources used in the preparation of this report, refer to the Works Cited.

Colorado and Community Histories
In addition to the large variety of publications on general Colorado history, numerous cities and counties have prepared histories of their own that are very useful in researching grain elevators. Both Donning Company Publishers and Curtis Media Group Corporation have sponsored some of these publications. The following local histories were identified during the project and in no way should it be viewed as comprehensive.

Colorado History
Abbott, Carl and Stephen J. Leonard and David McComb. Colorado: A History of The Centennial State. Niwot: University Press of Colorado. 1982, 1994. The publication is an excellent general text on Colorado history.

Noel, Thomas J. and Paul F. Mahoney and Richard E. Stevens. Historical Atlas of Colorado. University of Oklahoma Press. 1994. The publication provides a variety of maps associated with Colorado history.

Lewis, Michael and Joanne Ditmer. Colorado's Centennial Farms and Ranches: A Century of Seasons. Englewood: Westcliffe Publisher, Inc., 1994. This resources documents Colorado's farming and ranching heritage.

Community Histories

Appleby, Susan Consola. Fading Past: The Story of Douglas County, Colorado. Palmer Lake: Filter Press, c. 2001.

Bent County (Colorado) History. Las Animas/Holly: The Book Committee, printed by Holly Pub. Co., 1986-1987.

Breckenridge, Juanita and John. El Paso County Heritage. Dallas: Curtis Media, 1985.

Brown, Jane, ed. History of Washington County, Colorado. Dallas: Curtis Media Corp., c.1989.

Clagett, Laura Solze. History of Lincoln County, Colorado. Dallas: Curtis Media Corp., 1987.

Committee, Kit Carson County History Book, ed. History of Kit Carson County, Colorado. Dallas: Curtis Media Corp., 1988.

Crowley County Directory. Siebert: National Directory Company, 1934.

Dedman, Claude Vernon. The History of Yuma County, Colorado. 1932.

Duncanson, David C. The History of Prowers County. 1938.

Eicher, Ivan Lawrence. History of Morgan County, Colorado. 1937.

Gabehart, Margee, ed. History of Elbert County Colorado. Dallas: Curtis Media Corp, 1989.

Harper, Thomas Alan. The Development of a High Plains Community: A History of Baca County, Colorado. 1967.

Hill, James Henderson. A History of Baca County. 1941.

The History of Crowley County. Ordway: Crowley County Historical Society, 1980.

The History of Crowley County: This Is a Collection of General History and Family Histories of Crowley County. Ordway: Crowley County Heritage Society, c.1980.

The History of East Morgan County, Colorado: A Project of the Friends of East Morgan County Library. Dallas: Curtis Media Corp., 1987.

Jacobs, Ruth, and Kiowa County Historical Society, eds. Kiowa County Colorado Centennial History. Dallas: Curtis Media Corporation, 1989.

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Kugler, Deb, ed. History of Phillips County, Colorado. Dallas: Curtis Media Corp., 1993.

Leonard, Stephen J. and Thomas J. Noel. Denver: Mining Camp to Metropolis. Niwot: University Press of Colorado, 1990.

Lewis, Arthur V. A Brief History of Kiowa County, Colorado. 1938.

Lewis, Michael and Joanne Ditmer. Colorado's Centennial Farms and Ranches: A Century of Seasons. Englewood: Westcliffe Publisher, Inc., 1994.

Lipson, Irving A. Colorado Counties. Denver, 1963.

Macy, Guy E. A History of Pueblo County, Colorado. 1933.

Markoff, Dena S. Sugar City, Colorado Foxley & Co. Elevator. 1978, Photograph.

Millican, Valorie. The Homestead Years: Baca County, Colorado. Campo: Millican, 1998.

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Morris, Andrew and Sponsored by the Larimer County Heritage Association, eds. The History of Larimer County, Colorado. Dallas: Curtis Media Corp., c.1985-1987.

Old Mill. Pueblo: Pueblo County Historical Society, 1980.

Owens, Robert Percy. Huerfano Valley as I Knew It. Manuscript. Canon City Co. Master Printers, 1975.

Pearson, Sharon. "Kiowa County". Kiowa, 2006. June 24 2006. <http://kiowacountycolo.com>.

Porter, Stanley M. A History of Washington County, Colorado. 1935.

Pueblo Lore. Reference to State of Colorado, County of Pueblo, Articles of Incorporation #83859, June 1 1897. Pueblo, 2006.

Railroads in the Development of Kiowa County. Eads: Kiowa County Public Library, 1983.

Shwayder, Carol Rein, ed. Weld County Old & New. Greeley: Unicorn Ventures, c. 1983.

Society, East Yuma County Historical, ed. History of Wray, Colorado, 1886-1986. Dallas: Curtis Media Corp., c.1986.

Society, Fort Sedgwick Historical, ed. The History of Sedgwick County, Colorado. Dallas: Curtis Media Corp., c.1982- 1985.

Starnes, Shirley, ed. West Yuma County, Colorado: A History of West Yuma County, 1886-1986. Yuma Colorado Centennial Book Committee, Taylor Pub. Co., c. 1985.

Swanson, Evadene Burris. Fort Collin's Yesterdays. Fort Collins: George and Hildegarde Morgan, 1975.

Teal, Roleta D. and Betty Lee Jacobs, eds. Kiowa County. Eads, Colorado: Kiowa County Bicentennial Committee, 1976.

Wagner, Albin. Adams County, Colorado: A Centennial History, 1902-2002. Virginia Beach: Donning Co. Publishers, c.2002.

Warren, Hugh. The History of Bent County, Colorado. 1939.

Wells, Bud, ed. Logan County: Better by 100 Years: A Centennial History of Logan County, Colorado, 1887-1987. Dallas: Curtis Media Corp., 1987.

Woodard, N.E. Brief History of Baca County, Colorado. 1934.

Zupan, Michelle L. The Changing Face of Golden. Virginia Beach: The Donning Company Publishers, 2004.

Websites

Burlington Northern and Santa Fe Railroad, BNSF Grain Elevator Directory, List of Facilities in Colorado.
www.bnsf.com/markets/agricultural/elevator/menu/colist.html
Site provides information on elevator location, size and ownership. Some images are provided.

The Country Grain Elevator Historical Society.
www.country-grain-elevator-historical-society.org
Includes general information on grain elevator history and photo gallery of Colorado grain elevators.

Farm Net Services, Information for the Ag Industry.
www.farmnetservices.com/farm/Grain_Elevators/COLORADO_GRAIN_ELEVATORS/54-0.html
Lists most of the active grain elevators in Colorado with ownership information with some elevators with links to websites

FreePatentsOnline
www.freepatentsonline.com/
Searchable database of United State patents, patent applications and patent designs.

Grain Net News and Information.
www.grainnet.com/index.html
New about the grain elevator industry including information on modern equipment and links to grain elevator history.

Library of Congress, American Memory, Built in America
memory.loc.gov/ammem/collections/habs_haer/
Searchable database of properties documented through the Historic American Engineering Record and the Historic American Buildings Survey.