Specialty Malting

A Business Case for the Great Falls Montana Region

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Great Falls, MT
DEVELOPMENT
AUTHORITY

The Great Falls Development Authority (GFDA) is a public/private economic development partnership serving the 13 county Golden Triangle region of north-central Montana. Our mission is to grow and diversify the Great Falls regional economy and support the creation of higher wage jobs. We are a private-sector driven, award-winning professional economic development team that prides itself on providing excellent service to support long-term business success. We were the first economic development organization in the Rocky Mountain region to earn accreditation from the International Economic Development Council.

In Addition to World-Renowned Agricultural Production, we offer a range of support for agricultural and food processors, including workforce recruitment and training grants, land and equipment grants, access to low cost capital, low cost utilities, competitive shovel-ready rail-served manufacturing sites, abundance of spring and municipal water, the 6th best tax climate in the nation, and more! We are experts at structuring packages focused on long-term client success.

Purpose of This Business Case is to document the competitive advantages our region offers for niches in agricultural and food processing operations. We have developed business cases for a variety of other agricultural and food processing niches which may be of interest to you.

We look forward to learning about your company and how we may be able to find a great location for your start-up or expansion.

Executive Summary

The Great Falls Region is the premier location to develop specialty malting facilities for the following reasons:

- Barley and wheat crops grow abundantly in this region, giving specialty malt producers the substantial economic advantage of procuring grains directly from local growers.

- Montana is home to 53 breweries that use over 10 million pounds of malted grains per year distributing products to over 5,000 retailers in 24 states. Northwestern U.S. craft breweries utilize over 245 million pounds of malted grains per year.

- The Region has plentiful labor resources that can be coupled with Montana-sponsored workforce training financial incentives.

- The Region has two impressive, shovel-ready industrial parks with required infrastructure to support specialty malting facilities.

- Dozens of Montana-based and out-of-state trucking firms service the Great Falls Region, and I-15 Interstate Corridor in this region interconnects with major highway systems for efficient and cost-reducing transport of goods by truck throughout North America.

- The Region has BNSF rail for efficient transport of goods by rail.

- The Region has traction in the Intermediate Industrial Products segment of food and beverage manufacturing.

- Production energy costs in the Great Falls region are among the lowest in the nation. The Region boasts low natural gas rates for industrial use, which is necessary for industrial drying and kilning purposes.

This document outlines the justification for the start-up and operation of a specialty malting facility in the Great Falls Region. The profit opportunities that exist for specialty malting in Montana are uncommonly advantageous due to the rapidly increasing demand for specialty malts, reliable availability of barley, wheat, and specialty grains, and the plentiful resources available in the Great Falls Region.

Montana is the number one state for planting and harvesting barley in the entire nation, and is number four in the production of wheat.[i] Montana harvested a total 770,000 acres of barley and 5.65 million acres of all wheat in 2014. The Great Falls Region accounts for 73% of all barley grown in Montana in 2014. Other small grains grown and harvested in large quantities in Montana include barley, wheat, oats, rye, millet and a variety of other specialty grains.

Specialty malting technology featured in this business case is primarily focused on malting barley and secondarily malting wheat, however, many other grains such as millet, rye, corn, oats, spelt, and triticale grains can be the source of specialty malt as well. Specialty malts made from barley and wheat represents the vast majority of malts used for brewing beer, and demand for them is dramatically increasing within the microbrew and craft brewing marketplaces. As defined by the Brewers Association, microbreweries produce less than 15,000 barrels of beer per year with 75% or more of their beer sold off-site. A brewpub is defined as a restaurant that sells 25% or more of its beer on-site.

Agriculture is the number one industry for the Treasure State, Montana. According to the 2012 USDA Census of Agriculture, Montana's agriculture industry employed over 9.5 million acres to bring in over $4.2 billion in revenue to the state.[ii] Agricultural producers and processors in Montana have demonstrated the ability to efficiently grow and process agricultural commodities for shipment to customers worldwide. The Great Falls Region is an agricultural processing hub that excels in the conversion of Montana-grown commodities into intermediate products for food industries like craft brewing.

Food and feed component manufacturers in the Great Falls Region have been very successful in supplying efficient production and shipment of a wide variety of intermediate products to supply chains globally. Prime examples of bulk, intermediate products produced in the Great Falls Region are conditioned grains, barley malt, oilseeds, and pulses; milled flours, durum semolina, pasta products, vegetable oils, and honey. The Region is also home to a large-scale egg production operation.

Companies that control manufacturing operations in the Great Falls Region are:

Malteurop	Pasta Montana	General Mills
Cenex Harvest States	Cereal Food Processors	Columbia Grain
Great Northern Growers	Montana Milling	Montana Specialty Mills
JM Grain	Montana Eggs LLC	Montana Advanced Biofuels
Timeless Seeds	Giant Springs Water	Smoot Honey

Table 1: Great Falls Region Agri-processing Companies
Source: Great Falls Development Authority

The Great Falls Region's electrical costs are among the nation's lowest industrial electrical costs.[iii] The City of Great Falls has the lowest industrial natural gas cost in Montana, and that cost is lower than nearly all industrial sites in the nation. Operating within such substantial barley and wheat acreage coupled with lower energy and human resources costs, a specialty malt manufacturing operation in the Great Falls Region would have significant input cost advantages compared with the competition. Additionally, this type of facility in the Great Falls Region would have the opportunity to become the lowest cost producer of pea protein concentrates, isolates, fiber, and starches in North America.

Barley and Wheat Resources in the Great Falls Region

The Great Falls Region has a near ideal environment for prairie grasslands and their related cousins, small grains. As in other semiarid prairie grassland regions of the world, raising small grains, forage crops, and forage animals continues to dominate agricultural production. Wheat, barley, and forage crops command the Great Falls Region's agricultural crop profile. Only 2.6% of harvested land is used for crops other than wheat, barley, and forage. Of that, the majority is made up of another class of wheat, durum wheat for the production of pasta. An alternate crop that is making rapid inroads in the Region is dry-peas.

The Great Falls Region has the competitive advantage of a combination of geographic features, climactic conditions, topsoil composition, and water resources to make it a major intensive supplier of small grains. Montana, specifically the Great Falls Region, produces excellent quality malting barley. Farmers in the Great Falls Region have the resources and knowledge base to consistently produce malting barley with high quality in prodigious quantities. Also, the Great Falls Region has the advantage of raising a wide variety of consistently high quality small grain commodities in addition to traditional wheat and barley crops.

The competitive advantages of prodigious small grain production in the Great Falls Region point toward engaging in agri-processing economic development efforts with two categories of business development. The first category includes large scale, conventional commodity processing involving significant capital investment in plant and equipment. The second category discussed in this business case includes smaller scale, niche oriented processing involving capital investment in sales and marketing in addition to plant and equipment.

Large-scale commodity processing of barley in the Great Falls Region is dominated by the 200,000 ton per year malt processing facility, Malteurop. Smaller scale barley processing, namely, alternative specialty malt processing is feasible in the Great Falls Region due to abundant, high quality barley supply, a willing labor force, low cost energy, and a fast growing craft brewing industry within Montana.

Barley is grown throughout the Great Falls Region with a high concentration in the 80,000+ acre Greenfield Irrigation District in southeast Teton county and northeast Cascade county, centered in Fairfield, MT.[iv] As the foundation for wheat-based specialty malt production, hard red winter wheat is also grown predominantly in Teton, Pondera and Cascade counties in the Great Falls Region.

Barley Production

In 2015, Montana farmers were projected to harvest 860,000 acres of barley, more than any other state. Over 75% of that barley, or 645,000 acres, will be harvested in the Great Falls Region alone. (Figure 1 and Figure 2) In 2014, Montana farmers harvested 44,660,000 bushels of barley, and 32,805,500, or 75%, of those bushels were harvested in the Great Falls Region[v] as shown in Figure 3. Montana's barley production history has been steadily increasing as

shown in Figure 4. The increase came as barley farmers in other barley producing states switched to corn and soybeans.[vi]

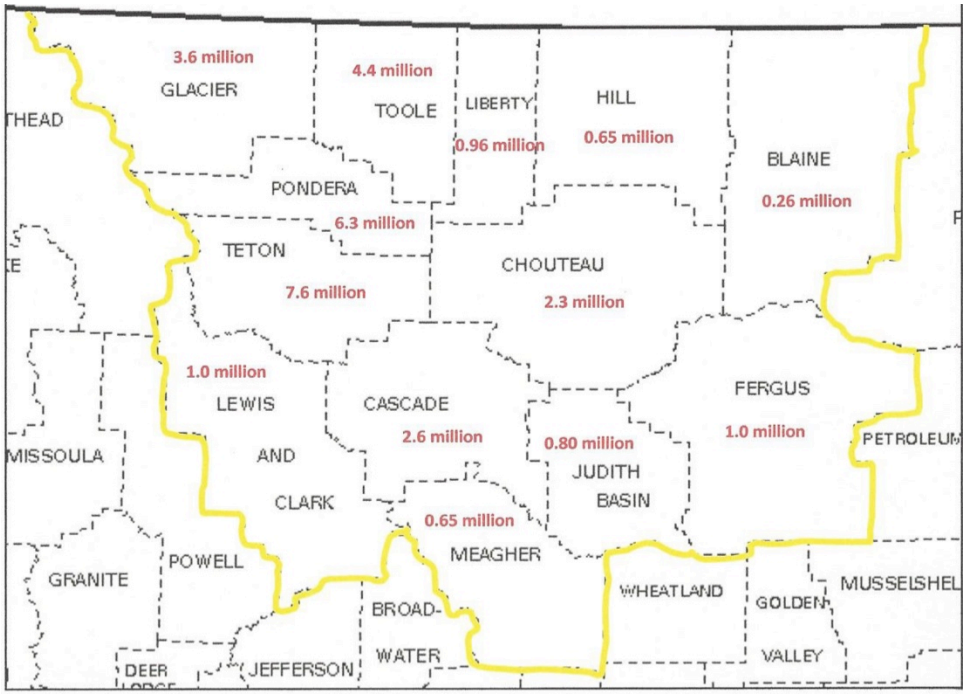

Figure 1: 2014 Barley Production in the Great Falls Region by County – Bushels
Source: USDA, NASS

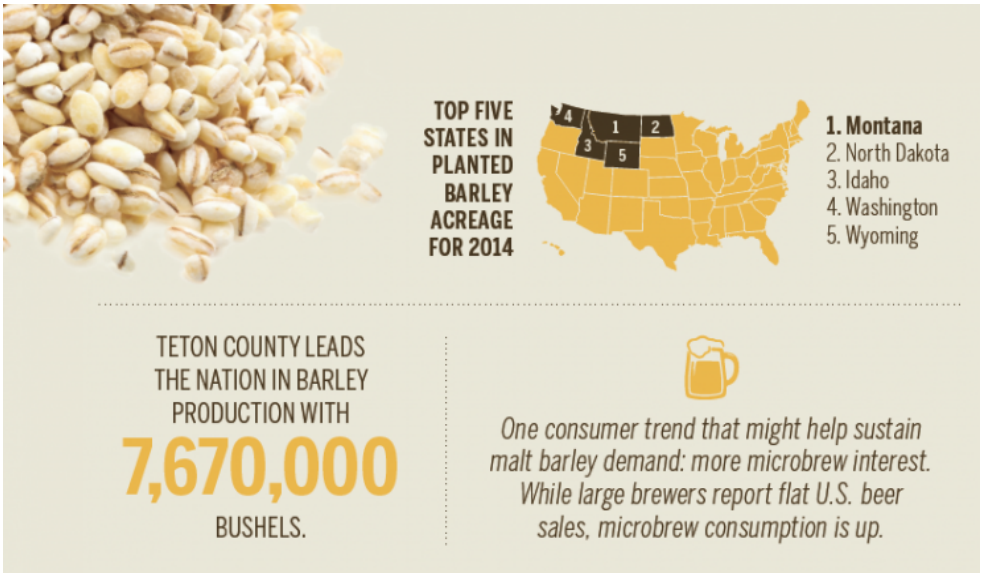

Figure 2: Montana is the Top State in Barley Production
Source: Montana Wheat and Barley Committee

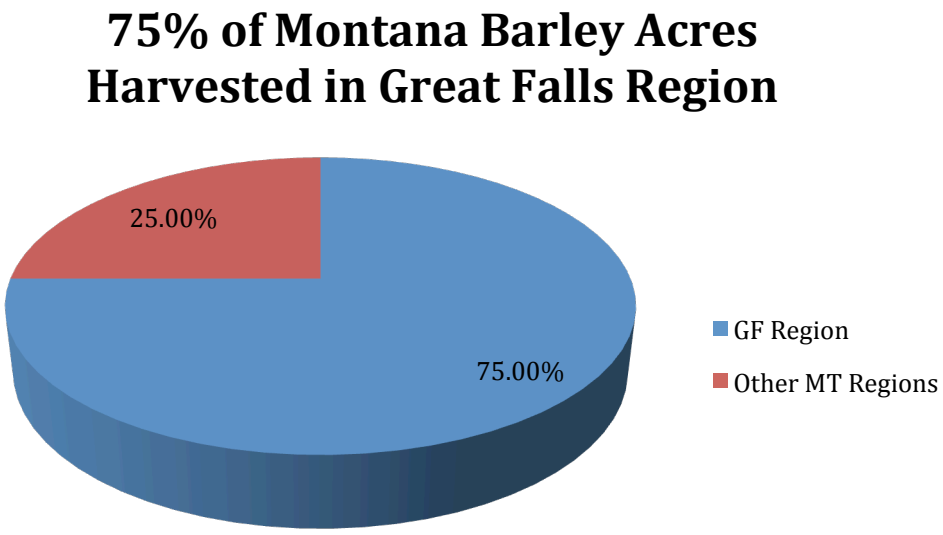

Figure 3: 75% of Montana Barley Acres Harvested in Great Falls Region Trade Area
Source: USDA, NASS 2014 Data

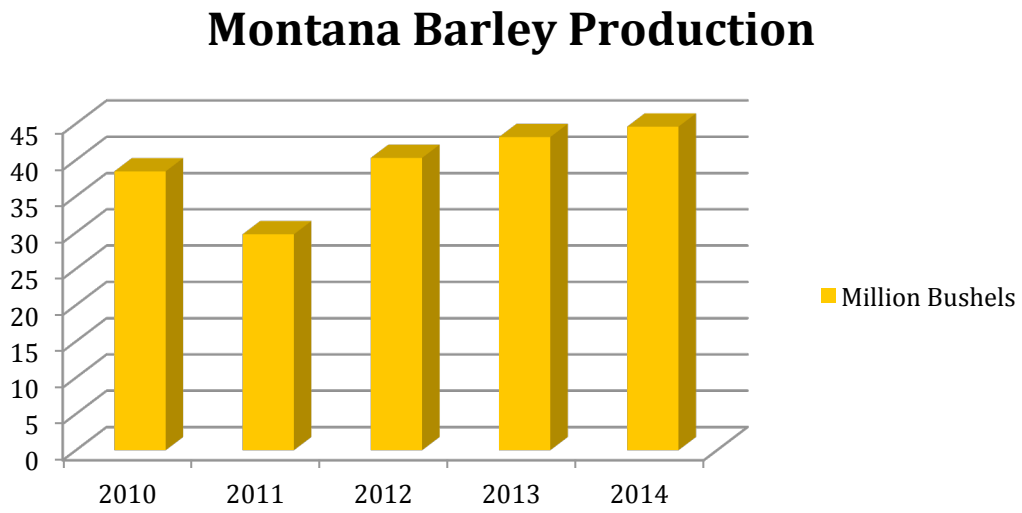

Figure 4: Montana Barley Production 2010 through 2014
Source: USDA, NASS

The USDA National Agricultural Statistics Service (NASS) mapped out barley production for Montana in 2014, which is shown in Figure 5. It can be clearly seen that the preponderance of barley production acres are located in the Great Falls Region. Over 90% of the barley varieties grown in Montana are made up of two row varieties rather than six row varieties.[vii] Two row varieties are well adapted to Montana's warm summer days and cool summer nights. Montana's Great Falls Region is a preferred area by maltsters to obtain high quality malting barley.

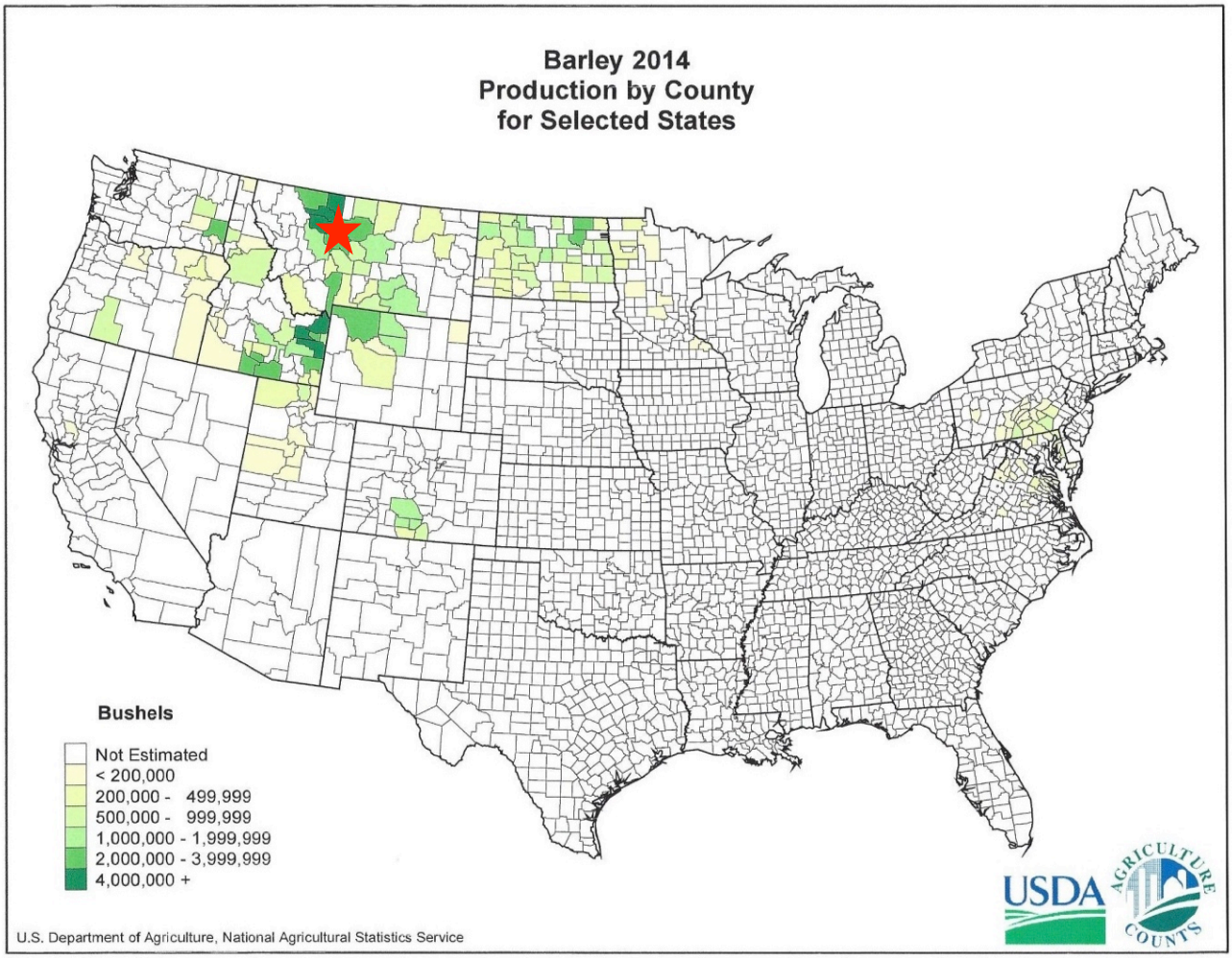

Figure 5: U.S. Barley 2014, Harvested Acres by County
Source: USDA, NASS ★Great Falls

Farmers in the thirteen county Great Falls Region trade area have become adept at raising barley and wheat in substantial quantities. Major malt production companies and brewing companies contract directly with Great Falls Region farmers to plant and harvest malting quality barley on an annual basis. The majority of barley produced in the Great Falls Region consistently qualifies as malting quality barley.

Table 2 shows the individual county barley production acreage and barley bushel yield in the Great Falls Region. A considerable percentage (29%) of harvested barley from the Great Falls Region is grown on irrigated land. Teton county produces more barley than any other county in the U.S. Teton County has significant acres in the "Greenfield Bench" that are irrigated. The USDA National Agricultural Statistics Service (NASS) reported that irrigated acres in Pondera and Teton counties in 2014 had double the yield per acre of dry land production.[viii]

Great Falls Region County	Barley Acres	Barley Bushels
Teton	104,100	7,670,000
Pondera	93,000	6,271,000
Toole	89,100	4,480,000
Glacier	86,300	3,555,000
Choteau	52,000	2,250,000
Cascade	45,300	2,683,000
Fergus	25,200	1,000,000
Liberty	23,000	960,000
Hill	17,200	650,000
Judith Basin	17,100	797,000
Lewis and Clark	12,500	1,005,000
Meager	9,700	644,000
Blaine	6,000	260,000
Total	580,500	32,805,500

Table 2: 2014 Barley Acres and Production in Bushels in Great Falls Region Counties
Source: USDA, NASS

Wheat Production

The thirteen counties of the Great Falls Region harvested 2.67 million acres of wheat in 2014, which accounted for 47% of all wheat acres harvested in Montana.[ix] In comparison, the Great Falls Region harvested 580,700 acres of barley, which was 21% of wheat acreage as shown in Figure 6. The Figure also shows that the Great Falls Region is dominant in barley acreage within the state of Montana.

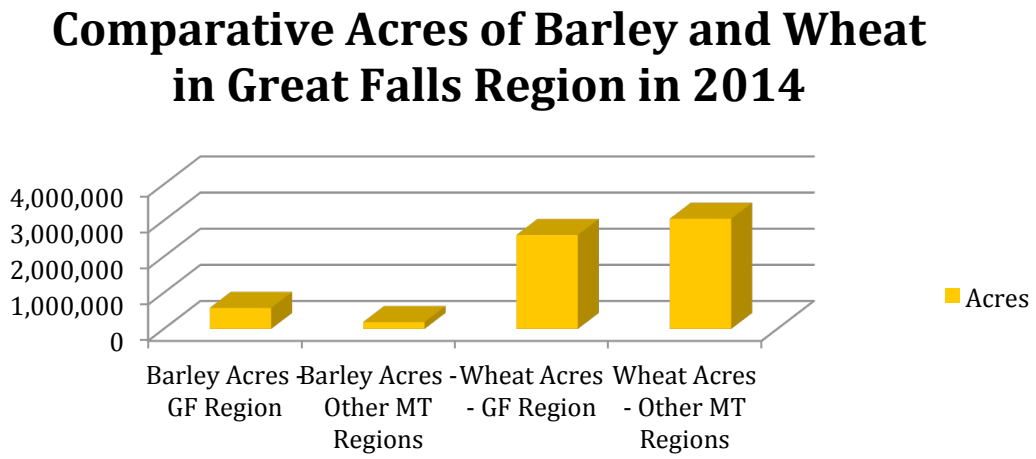

Figure 6: Barley and Wheat Acres Harvested in the GF Region and Other MT Regions
Source: USDA, NASS, 2014 Data

Proximity to Raw Materials

One massive benefit derived from operating a specialty malt production facility within barley production areas is that it can contract and purchase its barley, wheat, and other grains directly from regional farmers and local elevators. By receiving barley, wheat, and other grains directly from regional farmers, the company can capture receiving, cleaning, and conditioning margins that can amount to greater than 10% of annual raw material costs.

Within the Great Falls Region lies the Pondera County Canal and Reservoir District located in Pondera County. The District has been privately owned for 105 years and has 400 shareholders. The Company owns 30,000 acre feet of reservoir storage and 500 miles of canals. One of the primary commodities produced in the Reservoir District is barley. The barley grown in the District is among the finest quality barley grown anywhere in the world.

Barley contracts for the current crop year have been established around $11.00 per hundredweight for 2015.[x] Recent historical prices per hundredweight for on-farm barley has held steady around $11.00 per hundredweight. Launching a specialty malt production operation in the Great Falls Region would mean operating in very close proximity to raw materials, which significantly drives down the company's highest volume direct cost: grains for malting.

Malt Production in the Great Falls Region

Malteurop is the world's largest barley malt producer. The company operates 27 sites in 14 countries within the U.S., Canada, Europe, China, Australia, and New Zealand and produces an annual production of 2.2 million tons of malt. The Great Falls Malteurop facility produces 200,000 tons of barley malt annually. In the U.S., Malteurop operates a 220,000 ton per year facility in Milwaukee, WI and a 115,000 ton per year facility in Winona, MN.[xi]

The Great Falls Malteurop facility has the malting capacity to use 8.33 million bushels of barley annually. The State of Montana produced 44,660,000 bushels of barley in 2014 and the Great Falls Region harvested 32,805,500 bushels of barley in 2014. The Great Falls Malteurop facility had the capacity in 2014 to process only 25% of the Great Falls Regions' barley production and 18% of Montana's barley production.

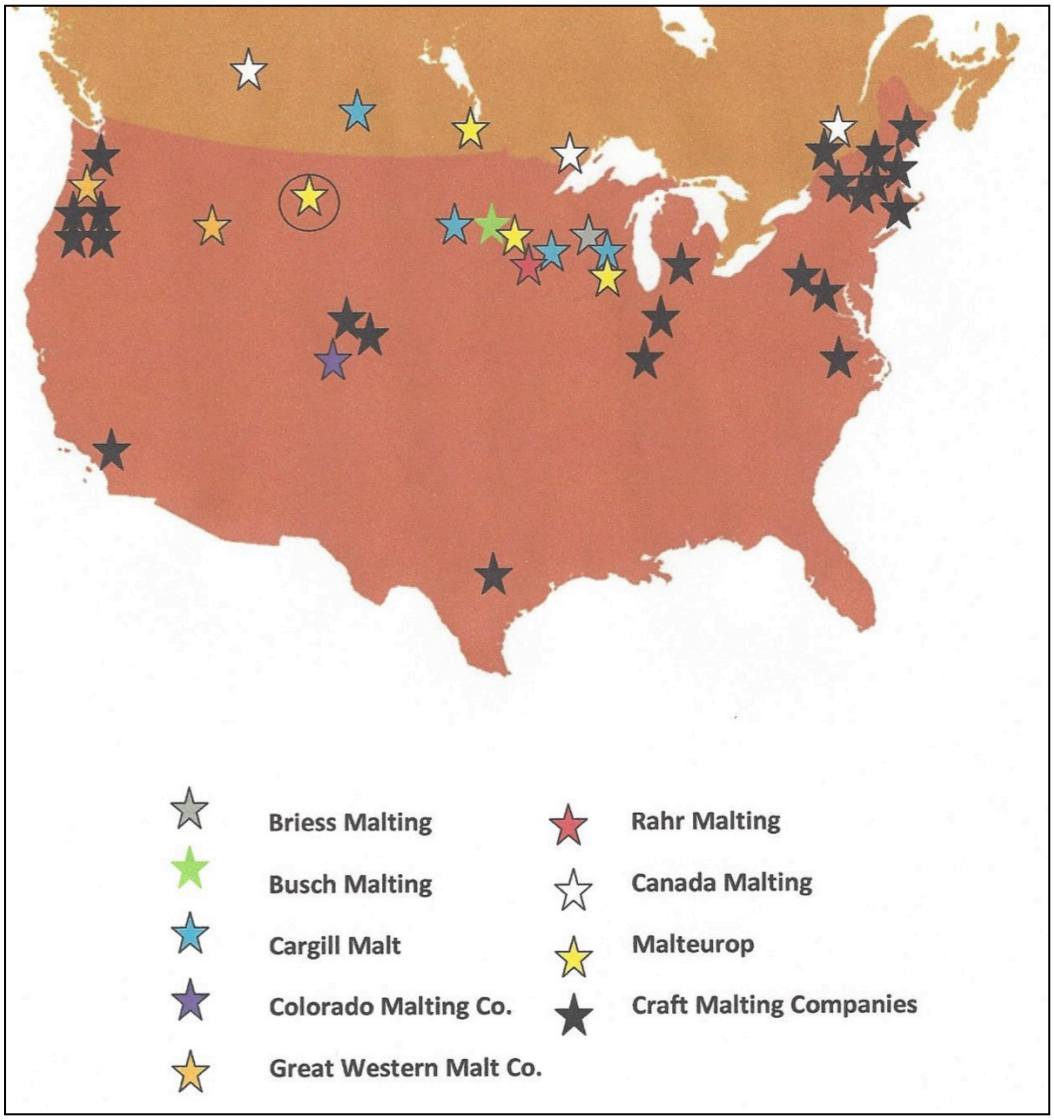

Figure 7: Malting Facilities in North America

Major industrial malting facilities in the U.S. and Canada are primarily located in malt barley production areas as shown in Figure 7. Smaller specialty malting facilities are primarily located in high population areas on east and west coasts along with the Denver and the Chicago areas.

Craft Breweries in the Great Falls Region

The Region is located within Montana's rapidly growing craft brewing industry. The state is home to 53 breweries that distribute products to over 5,000 retailers in 24 states. Montana breweries use over 10 million pounds of malted grains per year.

Malt Use in the Great Falls Region

The Northwestern and West Central United States had 863 craft breweries in 2014 as reported by the Brewers Association. The Association reported that in 2014 the compilation of nine states utilized nearly 250 million pounds of specialty malt produced from 6.2 million bushels of barley as shown in Table 3. Within the Region, Oregon, Colorado, Montana, Wyoming, and Washington are among the highest per capita consumption states. Figure 8 illustrates the relative close proximity of the multistate Region's craft brewing industry.

Craft Breweries in the Great Falls Trade Area							
State	# Breweries	Barrels/Yr	Million $/Yr	Lbs Malt/Yr	Bu Barley/Yr	Gal/Person Per Yr	U.S. Rank per Capita
MT	53	155,283	$234	10,869,810	276,274	6.4	5
CO	235	1,673,686	$1,634	117,158,020	2,977,766	13.6	2
OR	216	1,039,063	$1,295	72,734,410	1,848,666	11.1	1
WA	256	405,131	$1,006	28,359,170	70,796	2.5	12
UT	20	161,606	$255	11,312,420	287,524	2.7	32
ID	43	57,971	$173	4,057,970	103,140	1.6	20
WY	22	18,617	$113	1,303,190	33,123	1.4	8
SD	12	4,721	$75	330,470	8,399	0.2	36
ND	6	4,571	$82	319,970	8,133	0.3	19
Total	863	3,520,649	$4,867	246,455,430	6,263,821		

Table 3: Northwestern U.S. Craft Brewery Statistics – 2014
Source: Brewers Association

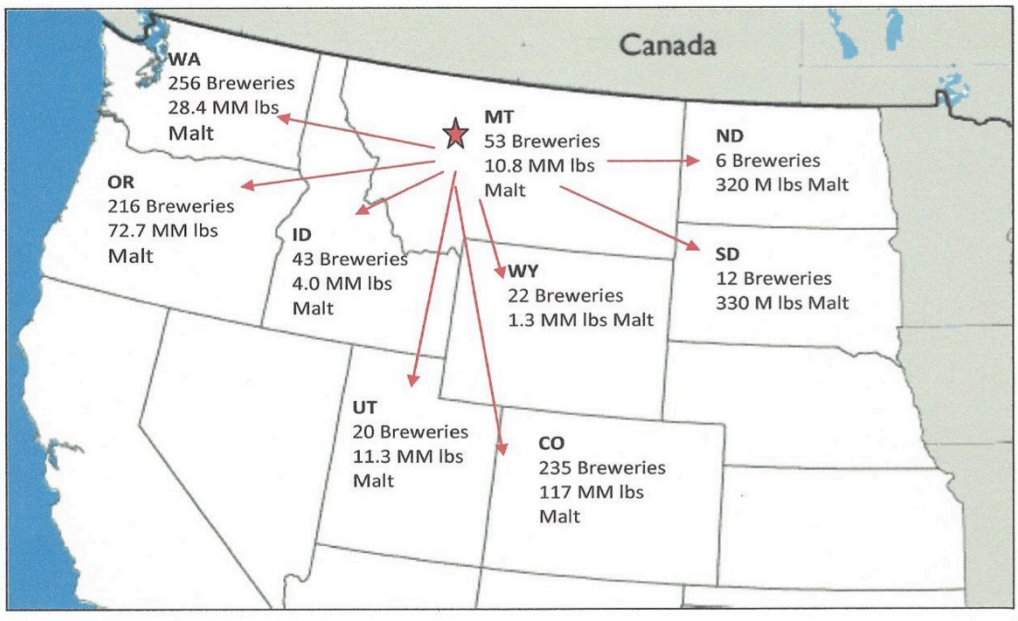

Figure 8: Malt Use by Craft Brewers in the Great Falls Region – 2014
Source: Brewers Association

Specialty Malting in the U.S.

The U.S. brewing industry is rapidly evolving. Craft brewers are changing the brewing industry landscape by rapidly introducing new craft beer varieties into retail and foodservice venues. According to the Brewers Association, in 2014, there were over 3,200 breweries operating in the U.S. producing over 10,000 brands of beer. (Figure 9 and Table 4) The Brewers Association reported that craft brewers in 2014 were utilizing over 25% of U.S. malt production while only comprising 11% of the volume of beer in the marketplace.

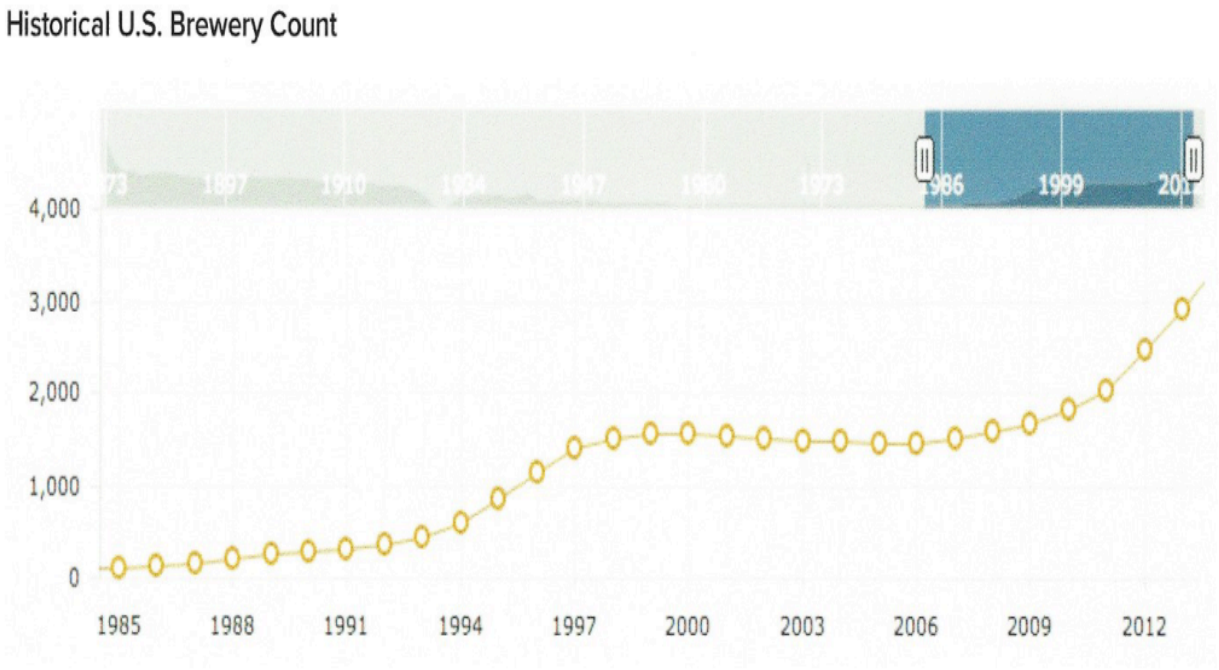

Figure 9: Increase in Number of Breweries in the U.S.
Source: Brewers Association

U.S. Brewery Count

	2012	2013	2014	'13 to '14 % Change
CRAFT	**2,401**	**2,863**	**3,418**	**+ 19.4%**
Regional Craft Breweries	97	119	135	+ 13.4%
Microbreweries	1,149	1,464	1,871	+ 27.8%
Brewpubs	1,155	1,280	1,412	+ 10.3%
LARGE NON-CRAFT	**23**	**23**	**26**	
OTHER NON-CRAFT	**32**	**31**	**20**	
Total U.S. Breweries	**2,456**	**2,917**	**3,464**	**+ 18.6%**

Table 4: U.S. Brewery Count Increase 2012 through 2014
Source: Brewers Association

The current U.S. brewing industry is characterized by fast growing product diversity and proliferation of 100% malt-containing beers. Concurrently, there is a rapidly increasing number of brewing companies. Craft brewers focus upon producing beers made from 100% malt while large lager-producing breweries produce beers made with adjunct grains such as corn or rice. To produce 100%-malt beer brands, craft brewers seek barley malts with distinctive flavors and aromas and unique biochemical compositions. U.S. craft brewers have sought out diverse malt types from around the world in order to differentiate their beers in an increasingly crowded marketplace.

The U.S. malting industry is highly concentrated with a few large companies dominating malt production. Mainstream malting operations are large entities designed to manufacture large quantities of uniformly produced malt suitable for lager beers made with adjuncts. Large-scale malting operations are not designed to produce small quantities of specialized malts with unique characteristics. Current large-scale producers of malt have production capacities that match the current production of large brewing companies.

The Brewers Association anticipates that there will be continued growth in the proliferation of small scale specialty maltsters that produce less than 500 tons of specialty malt annually and will be geographically spread throughout the U.S. Smaller specialty maltsters are projected to primarily produce highly customized specialty malts for smaller Craft Brewers. The Brewers Association reported that at least 16 craft maltsters were in operation in 2014 with an additional seven craft maltsters under construction.

The U.S. beer market is the most diverse on earth.[xii] The art of malting can be traced back to the earliest civilizations. Malting today is reclaiming the art form of malting by producing a wide variety of interesting and useful malting malt products. The Craft Maltsters Guild of Hadley, MA, defines craft malt as a finished malting malt product derived from a variety of grains that include barley, wheat, rye, oats, corn, millet, and triticale.[xiii] Malting malt can be produced from other specialty grains as well. Craft malt is further defined as having at least 50% of its grains sourced locally near the craft malt house.

A Craft Malt house is defined as a processing business that produces and sells a volume of craft malt between 5 metric tons (11,025 pounds) and 10,000 metric tons (22.05 million pounds) per year. Malt houses are not considered to be Craft Malt houses if non-Craft Malt house ownership exceeds 24% as defined by the Craft Maltsters Guild.

Specialty maltsters, producing 10,000 to 100,000 metric tons per year, who develop and operate malting operations in the Great Falls Region would utilize the value chain illustrated in Figure 10. Specialty maltsters using lean manufacturing policies procure barley from barley growers or grain handlers such as local elevators. Once produced by specialty maltsters, malt is sold to craft brewers through three value chain avenues. First, specialty maltsters sell directly to craft brewers primarily in their local area and also to craft brewers in other areas of the world.

Specialty maltsters use brokers as their sales force to sell malt to craft brewers. Brokers do not take title to a specialty maltsters' malt products, but receive a commission for malt products sold by specialty maltsters to craft brewers. Specialty maltsters also sell their malt products at wholesale prices to craft malt distributors, who purchase craft malt from specialty maltsters and resell specialty malt products to craft brewers. The benefits derived from selling malt products at whole prices to distributors is to engage in selling larger quantities of specialty malt per transaction and to expand their exposure to a larger number of craft brewers. Craft brewers purchase specialty malt from distributors along with other brewing supplies such as hops, adjuncts, sugars, yeasts, filtering aids, packaging materials, and sanitizers.

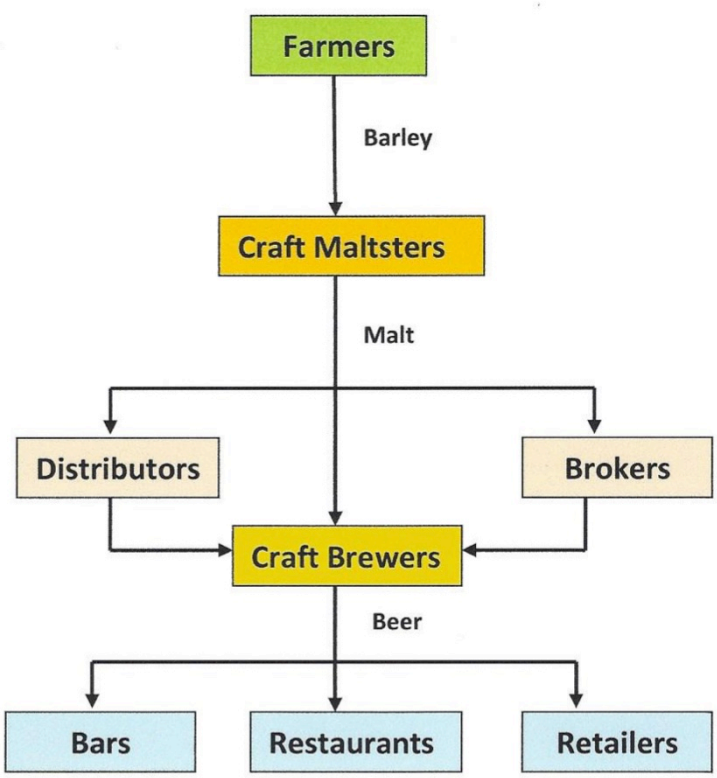

Figure 10: Specialty Malting Value Chain

Malt Production

Malting is a process in which barley and/or other grains are germinated, and then dried to create "malt." Grains are made to germinate by soaking in water and then halted from further germination by drying with heated air. The process of malting grains forms enzymes that become activated to convert grain starch into sugars and convert proteins to be used by yeast during fermentation. The malting process also produces distinctive flavor and color characteristics that result in unique fermented products such as beers, ales, and distilled spirits.

The production of specialty malt requires only a cereal grain, usually barley, and water using a three step process including steeping, germination and kilning. (Figure 11)

Figure 11: Three Steps in Malt Production

Steeping

Cleaned barley has average moisture content of 12%. By adding water to barley in the steeping phase of malting, the moisture content of barley increases to an average of 45%. Water is added at a temperature between 50°F to 65°F. Water is drained and refilled several times. Oxygen is introduced to aerate the steeped barley. The total time required for the steeping step is two to four days. Steeping is complete when barley rootlets (acrospires) begin to show.

Germination

The germination step takes place in specialized vessels at temperatures from 54°F to 59°F over a period of three to eight days. Air is routinely passed through the germinating barley bed to maintain germination viability and to remove accumulated carbon dioxide. Mechanical agitation is used to ensure that barley malt remains free flowing. Germinating malt is also called green malt.

Green malt exhibits the characteristic of a growing plant when barley kernels grow acrospires. Acrospires that grow to less than 75% of their barley kernel length and are under modified as malt for certain beer characteristics, and acrospires that grow to between 75% and 100% of barley kernel length are fully modified.

Kilning

Following the completion of germination, green malt is kilned. The first step of kilning is slow drying at modest temperatures usually below 120°F over the period of ten to twelve hours until a malt moisture content of approximately 5% is reached. At that moisture level, the germination process is halted in the malt. After drying, malt is heated and cured to give color and flavor character. Temperatures of 180°F for pale malts and up to 500°F for darkest malts are used to develop malt character. Darker malts often are produced in drum roasters. After kilning, acrospires are retained within malt and rootlets and loose hulls are removed. Table 5 summarizes malting process conditions.

Process Stage	Steeping	Germination	Kilning

Processing Conditions Range	Water Temp 50 - 65°F Target Moisture 43-44% Duration: Up to 48 Hours Aeration: Out of Every 30 Minutes Maintain Adequate CO2 Evacuation 15 minutes	Air On Temp: 54 - 59°F Duration: 3.5 – 4 Days Air Flow: 9 – 10 m3/minute/tonne Bed Depth: 32 - 50 inches	Air on Temp: 1) Free Dry at 112 - 155°F for 10-12 hours 2) Heating at 155° - 178°F for 2-3 hours 3) Curing at 178° - 185°F for 4-4 hours Total Duration: Up to 24 hours Air Flow: 60-80 m3/minute/tonne for bed depth of 32-36 inches
Typical Example	40 Hours Total Cycle – 8 hours Wet/10 hours Dry/8 hours Wet/10 hours Dry/4 hours Wet at 57°F	Day 1 and Day 2 @ 57°F Day 3 and Day 4 @ 55°F	20 Hours Drying Cycle with 4 Hour Curing Cycle

Table 5: Processing Conditions for Malt Production
Source: Canadian Marketing Barley Technical Centre

The production of malt utilizes barley, water, electricity, and natural gas. Table 6 shows barley malt inputs and outputs. Barley is immersed in water to increase its moisture content from 14% to 45%. Substances are leached and washed from barley and are deposited in immersion water. Some of the substances inhibit germination and must be removed by periodically replacing immersion water. The effluent substances comprise up to 1.5% of original barley weight as shown in Table 6. Malt screenings and sprouts are used for animal feed and are currently sold for $150 to $175 per ton, F.O.B. malting facility.

Production of One Ton of Malt			
	Material/Utility	Quantity	Unit
Input	Barley	1.22	ton
	Water	538	gallons
	Electricity	87.4	kWh
	Natural Gas	1.36	MMbtu
Output	Malt	1.00	ton
	Malt Screenings	27.3	lb
	Malt Sprouts	96.8	lb
	Effluent Substances	36.6	lb

Table 6: Malt Production Input and Output Statistics
Source: Novozymes A/S

Financial Illustration – Specialty Malt Production

In 2014, the Montana Department of Agriculture, Helena, MT in conjunction with the Montana Manufacturing Extension Center, Bozeman, MT conducted a Malting Industry Analysis.[xiv] After

careful market analysis, the Department of Agriculture malting study selected a malt production facility model with an output of 10,000 tons per year. The Study estimated that the total cost for a 10,000 ton per year facility would be $19.2 million. (Table 7)

Land and Facility	$5.2 million
Equipment	$19.0 million
Total Cost	$24.2 million

Table 7: Estimated Cost of 10,000 ton per year Malt Production Facility

A 10,000 ton per year malt production facility would utilize 300,000 hundredweight of barley to produce 20,000,000 pounds of malt products. A conservative average wholesale price of malt products of $0.55 per pound would generate $11 million in revenue per year. Barley input costs at $11.00 per hundredweight would be $3,300,00 per year for a 10,000 ton facility. Montana Department of Agriculture estimated additional direct costs to be $600,000 per year. Annual payroll for 10-15 employees in a highly automated facility would be $1.1 million as estimated by Montana Department of Agriculture.

The malting and brewing industry employs direct contracting procurement with barley growers. Malt producers and breweries have established long term relationships with barley growers in order to ensure reliability of supply and quality. Direct procurement programs of malt producers and breweries provide complete control of the malting process from the farmer's seed through to malt producers' brewery customers. Specialty malt producers are advised to adopt the same procurement model of direct contracting with barley growers. After harvest, barley grain must go through a dormant period prior to malting. Barley dormant periods can vary from one to eight months prior to malting. Dormancy requirements mean that malt producers must have a sizeable inventory of malt quality barley available throughout the processing year.

The summary financial Table 8 shows a pro forma cash flow forecast for a 10,000 ton per year malt production facility. Assumptions include debt paid back over 7 years at a 5% interest rate, plant operation at 75% capacity, and that all malt products are sold F.O.B. factory at $0.55/lbs.

for an average of all malt product produced. The total investment required for capitalization is assumed to include working capital.

Equity Investment	$9,600,000
Debt	$9,600,000
Total Investment	$19,200,000

	Year 1
Sales	$11,000,000
Cost of Goods	$3,900,000
Payroll	$1,100,000
Gross Margin	$5,000,000

Gross Margin available for additional costs (utilities, supplies, marketing, insurance, outside services, debt service, and repairs) and profitability.

Table 8: Financial Illustration for 10,000 Ton per Year Malt Production Facility

In the financial illustration shown in Table 8, a gross margin of $5,000,000 is produced to cover costs in excess of cost of goods and payroll. Provided that additional costs are less than available the available gross margin, profitability will occur. For example, a $960,000 profit would yield a 10% annual return on investment on a $9,600,000 equity investment

Summary

The Great Falls Region has significant competitive advantages for specialty malt production that include: close proximity and access to abundant & consistent, high-quality grain commodities, access to a variety of cost effective energy sources (electricity and natural gas), rail transportation in the form of single source service by the nation's second largest railroad (BNSF), the I-15 Interstate Agri-Business Corridor, abundant water resources from ground and surface water options, and a willing and capable workforce. The Great Falls Region's industrial parks also feature industrial wastewater treatment, fiber optic connectivity, and attractive financial incentives.

Specialty malting operations in the Great Falls Region would have the opportunity to obtain high barley and wheat commodities directly from agricultural producers. Grain procurement transportation costs in the Great Falls Region would be low relative to competitors located outside of grain-growing areas. On-farm storage of commodities throughout the Great Falls Region provides year-round access to barley and wheat commodity deliveries to specialty malt production facilities.

The combination of cost effective energy, water, property, barley and wheat commodities, and human resources all work together to provide a superior business environment for the establishment of profitable specialty malt production operations in the Great Falls Region. The Region can provide an optimum environment for specialty malting facilities.

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