Fields Innovation District:

Meridian's Ag Bioscience Business Enterprise Corridor

Where technology meets agriculture

Fall, 2009

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Idaho has deep roots and a solid reputation in agriculture. The State has expertise in approximately 140 different crops, of which over 100 are grown in the Treasure Valley. The same valley that has earned national rankings for its technology presence and is number one for patents per capita. It only makes sense that Meridian, the center of the Treasure Valley, is the epicenter where agriculture and technology converge. The City of Meridian has a vision of creating an Agricultural Biological Science (Ag Bioscience) Business Enterprise Corridor in a 6-square-mile area in northwest Meridian, where low-density business parks will blend naturally into the existing agricultural setting of the area. The business enterprise corridor designed for Ag Bioscience businesses will closely link with urban living and service centers, allowing for an interactive live-work environment. The central location of Meridian assures efficient connection to prime agricultural production areas in the state of Idaho and the Pacific Northwest. Furthermore, Meridian as the center of the Treasure Valley, will connect these agricultural activities with the focus of technology in the Valley--a perfect convergence of technology and agriculture. See Appendix A for a map and description of the Fields Innovation District.

Why Ag Bioscience? A Closer Look

Ag Bioscience is a rapidly evolving industry that includes a variety of related sectors, including nutraceutical and functional food, animal health, nutrition and immunology, biofuel, and crop biotechnology-related business sectors. The field of Ag Bioscience is where people in agriculture meet people who work in the medical and nutritional fields; where new technologies are introduced to process animal products into functional ingredients; where the next generation of biofuels are borne; and where new crops are developed to produce more with less. It is a multidisciplinary field where scientific knowledge and creativity merges with business opportunity to create and deliver innovative, sustainable solutions to present-day challenges.

The Ag Bioscience industry is represented by a number of related sectors, each with significant, multi-billion dollar market values:

- **Nutraceutical and functional foods:** Identification, extraction and production of foods, food extracts, ingredients or bioactive components that may provide health and well-being benefits beyond basic nutritional functions. Widespread interest in the relationship between health and diet has led to a rapidly expanding sector supported by intense research in the areas of nutrigenomics, proteomics, metabolomics, and bioinformatics. Euromonitor International (2009) estimated the global functional foods market to be worth approximately $27 billion in the United States and $170 billion worldwide in 2007 and growing annually at up to 20% rate or five times that of the food industry as a whole. Currently, functional foods account for 5 percent of the total food industry.

- **Seed and crop technology and biotechnology:** Developing crops with valuable traits for food, feed and fuel, increasing resistance to pests, diseases and a-biotic stresses, improving water and fertilizer efficiencies, and improving yields. Global market value of biotech crops is estimated at $7.5 billion for 2008 (Cropnosis, 2009).

- **Animal health, nutrition, infectious diseases, and immunology:** These are areas under USDA's focus area of animal health and well-being. Presently livestock industries, particularly dairy and beef, represent the largest sectors of Idaho agriculture. Diseases associated with animal reservoirs such as *E. coli* O157, salmonellosis, and others, have serious impacts on both the livestock and fresh vegetable markets. These illnesses also impact public health in the United States through traditional transmission routes, and some

also have the potential to be homeland security threats. The animal health products market defined as the sector spanning veterinary pharmaceuticals, biologicals and medicated feed additives represent an estimated market value of $22 billion for 2010 (The Global Animal Health Industry Report Plimsoll Publishing Ltd., 2009). There is a rapidly growing need for research in these animal health areas.

- **Biofuels:** Decreasing oil production from reduced oil reserves, rising energy consumption, and environmental issues have led to significant investments in biofuels over the last decade. Local governments are taking initiatives to promote alternative fuel to meet the targets. For example, the U.S. pledged to nearly double ethanol production by 2012, and the European Community recently announced that biofuel will meet 10% of its transportation fuel needs by 2020. Global Biofuel Market Analysis (2008) estimates the global ethanol market to reach around 27 billion gallons by the end of 2014, and the global biodiesel industry is projected to grow to 3.9 billion gallons by 2014. In addition to biofuels, there is a developing market for bioproducts that are produced as by-products of the biofuel manufacturing process.

- **Molecular farming of pharmaceuticals (pharming):** Using plants or animals to produce recombinant therapeutics, including vaccines and diagnostics, such as recombinant antibodies, plasma proteins, growth factors, and anticancer drugs. Start-up pharmaceutical companies supported by mostly private monies are currently driving the development of these medicinal crops.

Sectors where agriculture and bioscience intersect are highly interconnected and are supported by vendors supplying a wide variety of specialty equipment and tools, engineering, and testing services. See Appendix B: "Ag Bioscience Industry Leaders and Emerging Businesses" for an example of businesses operating in these sectors.

Why Southwest Idaho Provides a Competitive Advantage

Ag Bioscience companies in the Fields Innovation District will be able to draw competitive advantages from the region's unique strengths:

- Temperate climate
- Highly diverse farming and processing industry
- Centrally located
- Research and education infrastructure
- Highly supportive, facilitative Idaho State Department of Agriculture
- Technology- and science-based economy
- Competitive cost of doing business

Southwest Idaho has a semi-arid climate with reliable weather conducive to growing high-value specialty and medicinal crops. The area is free from major weather calamities such as tornados, hurricanes or torrential rain showers that can destroy a crop within minutes. Low disease pressure and high productivity invited virtually all world lead seed crop companies such as Syngenta, Seminis, Nunhems and many more, to the area. The predictable weather is optimally suited for crops that need to be grown with scientific precision, directing its growth and development through spoon-fed fertilization and carefully designed water management programs. As a result, Southwest Idaho is the world leader in a number of high value-added crops, including mint, hops, and onions. In total, more than 100 different types of fruits, vegetables, row crops, seed crops and various essential oil crops are grown in the area.

Growers in this region have the unique ability to optimize production for a wide variety of contrasting crops such as dry beans, carrot seed, mint oil, lavender oil, corn, potatoes, and more. As these crops require distinctly different production programs and equipment, growers are able to manage and optimize production in fields ranging from 5- to 160-acre irrigated pivots, while maintaining segregation for full identity preservation. As a result, a unique industry-grower infrastructure has been developed that is able to handle, segregate, condition, and process these

crops. This industry is better equipped to meet the Ag Bioscience industry's specialty needs than most other major growing areas in the United States. Furthermore, Southwest Idaho is centrally located between three other major agricultural production areas in the Pacific Northwest, all of which are within a 300-mile radius: the Columbia Basin to the northwest, the Palouse area to the north, and the Snake River Basin area to the southeast.

The area is supported by Idaho's land grant university, the University of Idaho, with research and extension stations in Parma and Caldwell. In addition, a branch campus of the university is located in Boise. A partnership also exists in the Boise Valley with the USDA Agriculture Research Service, which has facilities co-located with the university in both Parma and Boise. At these locations, a variety of research programs, ranging from plant breeding, crop biotechnology, plant disease, and agronomy, is conducted for all predominant crops grown in the area. Crops supported at these sites include potatoes, grains, wine and table grapes, mint, tree fruit, and hops. Breeding for improved crop varieties continues to be an emphasis of local university researchers, who also conduct a significant amount of work with transgenic crops.

The University of Idaho Caldwell Complex is a unique site that includes the Food Technology Center (with a test kitchen and pilot plant) and a Business and Technology Incubator. These facilities are available to local start-up food production businesses and also work closely with the USDA-ARS viticulture program, which plans to expand its wine-making capabilities.. Also located at this site are research and extension faculty with expertise in beef and dairy production as well as human nutrition. Furthermore, the University of Idaho has received a $10 million appropriation from the Idaho Legislature to help construct the Idaho National Center for Livestock Environmental Studies (INCLES) to be located in the Magic Valley. With convenient access from the Boise Valley, this state-of-the-art research center in a rural setting could be a field test site for animal Ag Biotechnology developed by researchers in Meridian's Agricultural Biological Science Business Enterprise Corridor.

Animal health, nutrition, infectious diseases, and immunology are among the strongest areas of scientific study at Idaho's research institutions, including the University of Idaho. A critical mass of biomedical, veterinary, and animal scientists currently exists in these areas. Extending this area of excellence to Southwest Idaho would be an excellent link and source of collaboration with the biomedical researchers and educators at the Idaho State University facility located in Meridian.

In addition, the region provides local access to a number of other public and private universities, a local community college, and hospitals and other medical organizations from which to conduct clinical trials, human intervention and/or observation studies to test and develop products as well as provide workforce training.

The Idaho State Department of Agriculture provides crucial technical, financial, scientific, and marketing laboratory support for Idaho agriculture. It is recognized by its agricultural constituents and businesses for its pragmatic and supportive approach to meeting and managing new challenges and new opportunities that arise.

Southwest Idaho and the Boise Valley offer an attractive environment for businesses. In addition to a pro-business regulatory environment, they offer a low cost of doing business estimated to be a third lower than that of California or Washington. Economy.com ranked Idaho among the 10 states with the lowest overall costs of doing business. The Corporation for Enterprise Development rates Idaho No. 1 in manufacturing investment and sixth in long-term employment growth. This is due in part to low workers' compensation insurance premiums, competitive natural gas prices, and low electricity costs with hydropower as a base.

This business-conducive climate and the presence of the technology giants Micron Technology and Hewlett-Packard have led to an explosive growth of innovative, high-technology companies in the Boise Valley during the last quarter century. According to Idaho Commerce and Labor statistics, Idaho is No. 1 in the nation for patents per capita and ranks fifth in the creation of new companies. Technology-based companies represent currently 50% of the Boise Valley economy (Idaho Department of Commerce).

Meridian's Fields Innovation District: Ideally Positioned to Converge Agriculture with Technology

In addition to the advantages that an industry enterprise corridor, or cluster, can provide for a specific industry *(see insert "The Competitive Advantages of an Industry Cluster")*, Meridian's Fields Innovation District is ideally positioned to facilitate the merger of Idaho's traditional, most valuable resource, agriculture, with its vibrant technology and science-based economy in the Boise Valley. The District is located in northwest Meridian and encompasses a large area in excess of 3,000 acres of untouched farmland to accommodate the vision for the Ag Bioscience Business Enterprise Corridor. The District is centrally located in the Boise Valley between Interstate I-84 to the south and Hwy 20/26 to the north and along the future Hwy 16 north-south expressway extension that is planned to connect to I-84 (GARVEE project). The area is effectively connected to key state highways, is within 15 miles of the Boise airport as well as two nearby regional airports, and is a short distance from a freight rail corridor.

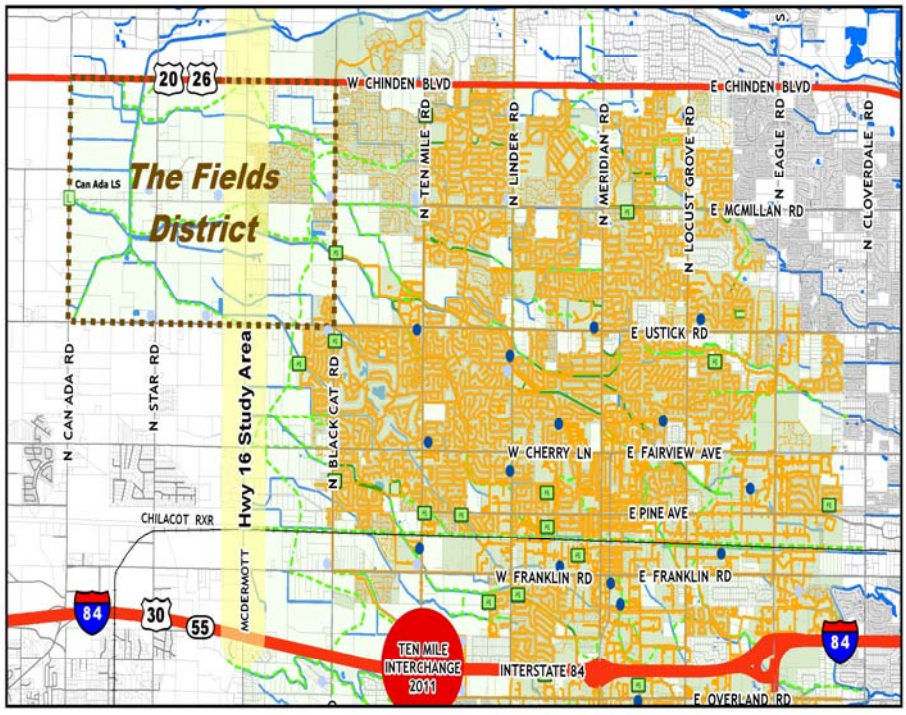
The Competitive Advantages of an Industry Cluster

An industry cluster is defined as a group of firms, and related economic actors and institutions, that are located near one another and that draw productive advantage from their mutual proximity and connections (The Brookings Institution, 2006). Firms within the same or related industries link through customers, suppliers, service providers, workforce, and represent a critical mass of skill, information, relationship and infrastructure in a given field (Michael Porter, 1995).

Industry clusters promote knowledge sharing and innovations in product development and technical and business processes by providing networks of formal and informal relationships across organizations. Companies in these clusters experience lower operations costs by enhancing access to specialized labor, materials, and equipment. Highly concentrated markets attract skilled workers by offering job mobility (EDA, Fall 2008).

An industry cluster orients local and regional economic development policy towards groups of firms facilitating targeted strategies and efficient use of tax dollars to boost regional productivity and competitiveness, and as such, will build on the unique strengths of a region.

The Fields Innovation District



The Fields Innovation District was included in Meridian's Area of Impact in early 2009.

Area water and sewer services have conceptually been master planned. Services will include a regional irrigation system using reclaimed water for predictable and longer watering season.

Power and natural gas are planned for the area.

Syringa Networks and Time Warner are working with the City on placement of fiber.

The District is also centrally located and close to a number of key businesses that represent various sectors of the Ag Bioscience industry:

- Food processing: AgriBeef Co., Amalgamated Sugar, Casa Valdez, Darigold, Fresca Mexican Foods, Great American Appetizer, Meadow Gold, J.R. Simplot Company, Sorento Laccillus, XL Four-Star Beef
- Seed and plant biotechnology: Crookham Company, Harris Moran Seed Company, Nunhems, Seminis, J.R. Simplot Company-Plant Sciences Group, Syngenta Seeds Inc.
- Food and functional ingredients, mixes, and performance products: Bigelow Tea, Body Building.com, Dorothy's LLC, Functional Ingredients Research Inc., Glanbia Nutritionals, HB Specialty Foods Inc., Nestle Power Bar
- Biofuels: Blue Sky Biodiesel, Idaho Ethanol Processing
- Dairy support services and animal health: Automated Dairy Systems, MWI Veterinary Supply

Research and Education Partnerships: Factors Critical to Success

Critical to the success of a technology-based industry corridor is the presence of research, education, and training institutes, such as universities, community colleges, and workforce training programs.

University of Idaho (U of I) The U of I's strong leadership in agricultural research, biotechnology, crop variety development and testing, animal and human health, immunology, infectious diseases, food safety, and nutrition, including functional foods, makes its presence and participation in the Fields Innovation District pivotal to the corridor's success. As important as the construction of the University of Central Florida University's Medical School was to the success of Orlando's Medical City business enterprise zone, so will be the presence of the U of I for the success of the Fields Innovation District *(see insert "Bringing University of Idaho to Meridian's Fields Innovation District").*

Idaho State University (ISU) This state university moved into its new Meridian location in August 2009 and operates out of 173,000-square-foot facility. ISU is a Carnegie Doctoral Research University and has a statewide mission in health science education. The ISU-Meridian Health Sciences Center will house a speech and hearing clinic, counseling clinic, Human Patient Simulation Laboratory, and in the near future an advanced dental residency.

The presence of medical research and education facilities is important for Ag Bioscience companies operating in human health and nutrition. Critical infrastructure for medical studies, research, and training is offered by Idaho's lead hospitals, St. Luke's and Saint Alphonsus, headquartered in nearby Boise with hospitals in Meridian, and Mercy Medical in nearby Nampa.

THE core
Idaho Coalition For Innovation
Health · Research · Technology

Meridian's first business enterprise zone, The Core, spans a 6-square-mile area with approximately 1,800 available acres in the center of the Boise Valley. The Core is focused on health sciences, research, and technology.

The Core is anchored by organizations with nationally recognized reputations: Idaho State University, St. Luke's Meridian Medical Center, Idaho Urological Institute, and Blue Cross of Idaho.

The Core, Idaho's Coalition for Innovation, has seen an increase of 60 businesses, equating to over 1,300 jobs in the last 3 years. This public-private partnership is fostering economic growth anchored by quality health & medical science services education, research, and advanced technology. Much of the available acreage is entitled and zoned with high-speed fiber, utilities, an existing transportation infrastructure connecting to Interstate 84, and just minutes away to the area's metropolitan airport. The Core's education anchors, Idaho State University and Joint School District No. 2, are strong in the fields of health sciences and technology-focused programs at the secondary, baccalaureate, master and doctoral levels.

In addition, *The Core,* a Health Science and Technology Business Enterprise Corridor in southeast Meridian, houses a number of organizations that provide cutting-edge health science services and a variety of clinical and health care facilities as well as the ISU-Meridian Health Science Center (see insert *"The Core"*)

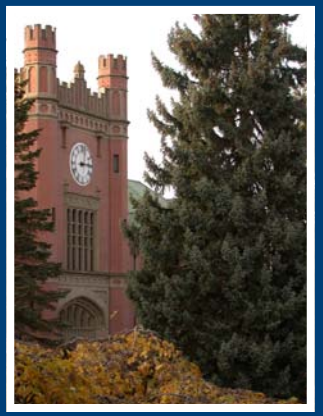
Idaho National Laboratory (INL) This federally owned laboratory located in eastern Idaho has a stated commitment to growing its presence in providing leadership for the State of Idaho's renewable energy initiative and increasing mission-specific public-private partnerships and collaborations. The robust science and enabling research capabilities in bioenergy, biotechnology, and environmental science among other areas that INL would be able to bring into partnerships with Ag Bioscience industry would be significant.

Boise State University (BSU). Boise State's role as an emerging metropolitan research university of distinction plays a crucial and growing part in the region's economic development and famed quality of life. With nearly 170 academic programs and a campus master plan, Boise State is growing to serve its students and the community at large. Boise State is in the midst of a transformation that nurtures its traditional strengths while expanding its capabilities in research and scholarly activity.

College of Western Idaho (CWI). The College of Western Idaho is the gateway to a comprehensive range of education and training opportunities suited to provide tailor-made educational programs and training programs targeted toward industry needs. CWI is a community asset that enhances accessibility to higher education and 21st-century technical skills acquisition.

Meridian Professional-Technical Center (MPTC). This Center is home to the *Agriculture, Welding/Fabrication and Natural Resources Magnet*. The 60,000-square-foot facility opened in 2007. The Agricultural program offers career pathway options in: 1) Welding/Fabrication & Mechanical; 2) Animal Science; and 3) Botany. The Center features a unique partnership (serving as a Regional Training Center for adults) with Miller Electric Manufacturing Company, the world's largest manufacturer of arc welding and cutting equipment. Students exit the Center with recognized industry certifications and college credit that is articulated with Idaho technical colleges and universities.

Bringing University of Idaho to Meridian's Fields Innovation District



University of Idaho

The presence of a University of Idaho research and education facility is envisioned to catalyze the success of the Fields Innovation District. A facility needs to house 6 to 8 research and education programs representing specific, high- demand sectors of Ag Bioscience. Ideally, two teams working on programs relevant to agriculture in the Boise Valley and the State would be co-located at the site. It is envisioned that one team would provide a center of expertise in animal health science and the other would have complementary expertise in nutrition and crop biotechnology. The synergy and cost savings would be realized by the overlap in instrumentation and expertise needed to conduct modern biotechnology. The cost of such facility would be approximately $25 million to construct and equip. Except for faculty and support salary, once established, operating the research programs on an annual basis would require approximately $150,000 to $300,000 per program, which is envisioned to be ultimately fully financed by industry research contracts and external grants.

Facility construction and faculty start-up will require legislative support to expand the mission of the University of Idaho's to include specific Ag Bioscience fields of research as well as support for an integrated involvement in urban agriculture in the Boise Valley.

The Road Map to Implementation

Important and critical steps are needed to take this from concept to realization:

Steering Committee: This group first met in spring of 2009 to discuss the concept of the Ag Bioscience Business Enterprise Corridor and expressed interest in future discussions. This group will evolve into the Steering Committee, with an appropriate mixture of leading industry representatives, entrepreneurs, workforce and economic development, and academia.

Role and Objectives of Steering Committee

1. Monitor progress of the project.
2. Help identify and recruit "Key Influencers" who can impact key stakeholders and potential financial sources. Sectors to be represented:
    A. Ag Bioscience sector representatives of local businesses
    B. Banking
    C. Local hospitals: medical and nutritional expertise
    D. State Legislature
    E. Universities
    F. Public and Government Relations expertise
    G. City of Meridian and surrounding cities
3. Review and improve project deliverables
    A. Produce briefing paper/research.
    B. Refine cluster group action plans.
    C. Help link plans to resources.
4. Develop communication and public relations program to effectively address citizens' questions or concerns regarding the District's vision.
5. Oversee development and execution of fund-raising strategy.
    A. University Research and Education building and program funding
    B. Fields Innovation District marketing
    C. Land value redistribution supporting agricultural green zones, hobby-farm concept
6. Act as ambassador for the project.
    A. Explain project to own sector.
    B. Advocate for collaboration with other sectors.
    C. Participate in Implementation Launch Event.
7. Manage transition from Incubation to Implementation stage.

h 2011

Public Relations: In conjunction with industry and government, an effective communication plan needs to be developed and a spokesperson identified who will be available to address citizens' questions and concerns regarding the District's vision and goals, industries targeted, and proposed land uses.

Public Process: There is a need for two separate public outreach efforts: 1) land use (working with property owners in the designated area for a comprehensive plan overlay); 2) recruitment (specific to the business industry cluster in working with the region's industry leaders).

Strategic Funding Plan: Landowners, developers, industry leaders and entrepreneurs, cities/counties, State of Idaho/Legislature *(see insert "Timeline and Milestones")*.

Strategic Marketing Plan: Including web site and logo *(see insert "Timeline and Milestones")*.

Implementation: This phase is multi-faceted in the number of efforts to move from plan to action. Actions will include integration into a wide range of economic development policy and planning efforts. The City's Planning Department has begun the initial steps to understand infrastructure and technology needs, appropriate buffer corridors between uses, as well as land use designations. Locally, Meridian has developed cluster components in the outreach efforts and is working with regional and state economic development organizations/agencies for a coordinated understanding and approach. Meridian is committed to leading the support for the implementation of the Ag Bioscience Business Enterprise Corridor. The efforts of the Steering Committee and participants in the public process will bring accountability to the launch and for implementing actions while moving forward.

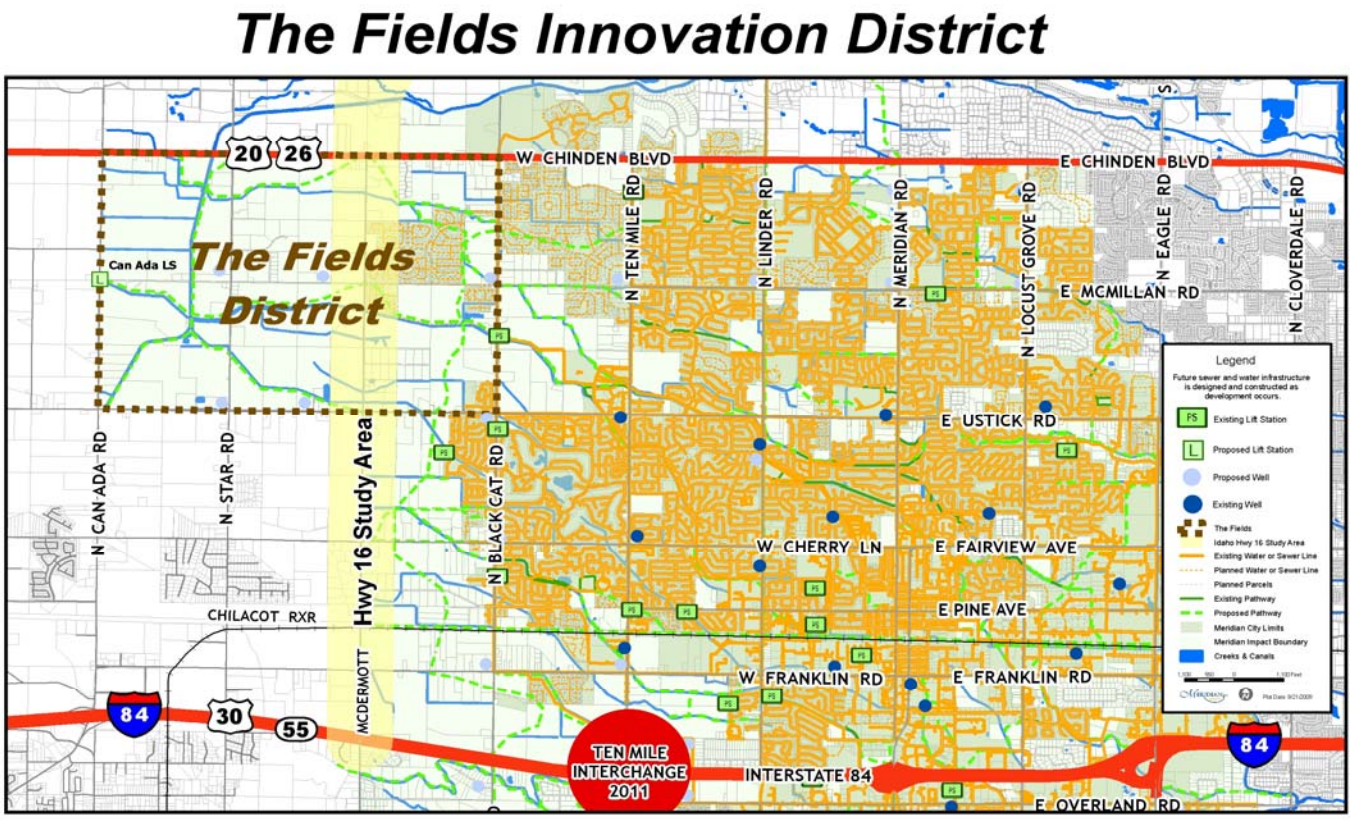
Timeline & Milestones

(Preliminary)

- Steering Committee development; recruit key influencers:
  August-November 2009
  -Invitations sent: September 2009
  -First meeting: November 2009
- Define roles and responsibilities: November 2009
- Evaluate white paper and identify next steps: January 2010
- Recruit participants (public process) and facilitate outreach:
  March 2010
  Concurrent public workshops on area-specific plan (separate but critical): February-June 2010
- Review and improve project deliverables: April 2010
- Develop and execute strategic fund-raising plan: May 2010-March 2011
  -Fund-raising plan complete: July 2010
  -Execution: August-December 2010
  -Legislative outreach: August 2010-March 2011
- Strategic marketing plan: October 2010-January 2011
  -Plan development: October 2010
  -Launch: January 2011

Appendix A

Meridian's Fields Innovation District: A Live-Work Concept



The District is a business park-residential work-live environment that integrates agricultural fields and open space as a buffer between residential areas and Ag Bioscience businesses.

The Fields Innovation District will accommodate different types of Ag Bioscience businesses.

- 0.5 - to5-acre lots: Headquarter offices and small research labs. These are adjacent to the residential areas. Sufficient buffering and security is needed from the residential areas. Similar developments in Meridian include El Dorado and Silverstone. Total park: 100 to 200 acres.
- 10- to 20-acre lots for businesses needing greenhouses, large lab facilities and/or multiple buildings. This park will house the University Ag Bioscience Research and Education facility. Total park: 100 to 200 acres.
- Light industrial core: light processing, distilling, brewing, more industrial-oriented activities. This is best suited up against Hwy 16 needing 5- to 10- acre lots. Easy access by trucks is available. Total park: 50 to 100 acres.
- One large business/technology campus for one potential business: 100- to 200-acre development. Secure, easy access, with one main entrance that can be secured.

(**Right:** For example, Monsanto's R&D campus in Chesterfield, Missouri.)

Agricultural Areas
Buffering residential housing from Ag Bioscience businesses. 5- to 20-acre lots for hobby farmers, orchards, vignette, and viticulturists (hobby wine makers) who wanting to grow locally grown vegetables and produce potentially using commonly shared equipment and buildings. These lots can be bought by people who want to farm and produce and sell food locally. Total 100 to 200 acres.

Residential Areas
Core residential areas are Star Road and McMillan. They include village centers, higher density, lifestyle centers, different main street, and roundabouts going into different areas of town. Total 1,000 acres.
Low density, estates: 0.5- to 5-acre lots. Total 200 to 300 acres.

Appendix B

Ag Bioscience Industry Leaders and Emerging Businesses

The Ag Bioscience industry is represented by a number of related sectors, each with significant, multi-billion dollar market values.

- **Nutraceutical and functional foods:** Euromonitor International (2009) estimated the global functional foods market to be worth approximately $170 billion in 2007 and growing annually at an estimated 5% rate.
  - Dietary components: A.B.F. Ingredients, ADM, Cargill, Nestle, Solanic B.V., Chr. Hansen, Cognis, DSM Food Specialties, Danisco, Direvo Biotech A.G., Hilmar Ingredients, International Dairy Ingredients, Maxx Performance, Natraceutical, Puleva Biotech Exxentia, SEPPIC, Taura Natural Ingredients, Food Ingredients USA
  - Health and wellness ingredients: Fortitech, Arboris, BerryPharma, Cell Biotech Europe A/S, Mach One, Denomega Nutritional Oils, Fenchem Enterprises Ltd., Lipid Nutrition, Lycored, Pharmalink International, Sabinsa Corporation, Sensus, The Solae Company,
  - Nanofoods: Leatherhead Food International, BASF, Aquanova, RBC Life Sciences, Shemen Industries, Health Plus International, Nestle, Unilever, Arla Foods
  - Pre- and pro-biotic foods: Danone, Beneo-Orafti, DSM Dairy, Danisco, Cargill, Cosucra, Sensus

- **Seed and crop technology and biotechnology:** Global market value of biotech crops is estimated at $7.5 billion for 2008 (Cropnosis, 2009).
  - Large seed and agribusinesses: Monsanto, BASF, Syngenta, DowAgroSciences, Bayer, J.R. Simplot Company-Plant Sciences, Forage Genetics, Harris Moran Seed Company.
  - Technology developers: Ceres, Mendel Biotechnology, CropDesign, PlantTec Biotechnology, Devgen

- **Animal health and nutrition, immunology, infectious diseases, and microbial food safety:** Global animal health market value is estimated to be approximately $22 billion in 2010 and over 250 companies are operating in this sector, of which the market leaders are:
  - Nutrition: BASF, Monsanto, Cargill
  - Immunology/infectious diseases: Pfizer Animal Health, Novartis, Schering-Plough
  - Microbial food safety; Bioniche Life Sciences, GangaGen Life Sciences, Micronics

- **Biofuels** - Global Biofuel Market Analysis (2008) estimates the global ethanol market to reach around 27 billion gallons by the end of 2014 and global biodiesel industry is projected to grow and touch around 3.9 billion gallons by 2014. A wide array of businesses is involved in research, development, and manufacturing of biofuels.
  - Feedstock genetics and breeding: Syngenta, Edenspace Systems Crop, Ceres
  - Feedstock logistics: Deer & Company, CNH America LLC, AGCO Crop, ADM, Cargill
  - Biomass conversion and production: Abengoa, POET LLC, Iogen, Pacific Ethanol, Range Fuels, ALICO, ZeaChem, Coskata
  - Enzymes and fermentation R&D: Novozymes North America, Genencor International, and Iogen Corp., Mascoma Corporation, Coskata, Inc., Amyris Biotechnologies, and Qteros
  - Conversion facility designers and constructors: Fagen, Inc., Burns & McDonnell, and KATZEN International

- **Molecular farming of pharmaceuticals (pharming):** This sector is in a start-up phase.
  - Plant-based: Dow AgroSciences, Dow Chemical, Ventria Biosciences, SemBioSys Genetics, Planet Biotechnology, Ventria Bioscience, Agragen, Biolex Therapeutics, Medicago
  - Animal-based: Genzyme, Pharming Group, PPL Therapeutics

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