1. **Agenda Item Title:** DRI Strategic Directions Plan  
**Meeting Date:** March 10-11, 2011

2. **BACKGROUND & POLICY CONTEXT OF ISSUE:**

   Board policy requires institutional strategic plans for each NSHE institution to be presented every six years.

3. **SPECIFIC ACTIONS BEING RECOMMENDED OR REQUESTED:**

   President Stephen G. Wells will give an overview of DRI’s 2011 strategic plan to the Board of Regents, based on the attached document, “DRI Strategic Directions,” which focuses on a five-year time frame of 2011-2015. The plan is being presented to the Board of Regents for their information and approval.

4. **IMPETUS (WHY NOW?):**

   NSHE schedule dictates the plan is due for presentation to the Board of Regents.

5. **BULLET POINTS TO SUPPORT REQUEST/RECOMMENDATION:**

   - DRI has made significant progress and changes to the plan since its last presentation in 2007.
   - Numerous meetings were held with administrators and faculty and staff representatives who helped develop the strategic directions and goals. DRI’s faculty senate and faculty at-large participated and approved the presented plan.
   - The strategic plan ties to the NSHE 2010 master plan.

6. **POTENTIAL ARGUMENTS AGAINST THE REQUEST/RECOMMENDATION:**

   None.

7. **ALTERNATIVE(S) TO WHAT IS BEING REQUESTED/RECOMMENDED:**

   None.

8. **COMPLIANCE WITH BOARD POLICY:**

   - Consistent With Current Board Policy: Title # 4 Chapter # 14 Section # 3
   - Amends Current Board Policy: Title # _______ Chapter # _______ Section # _______
   - Amends Current Procedures & Guidelines Manual: Chapter # _______ Section # _______
   - Other: __________
   - Fiscal Impact: Yes _____ No X
     - Explain: While the Strategic Directions document identifies elements that may have future fiscal impact, the document itself does not have a fiscal impact.
DRI Strategic Directions
Five Year Plan

Presented by:
Dr. Stephen G. Wells
to the
Board of Regents
March 2011
1. Introduction

- In 2010 the President of DRI held a series of leadership meetings. Participants included administrators and faculty and staff representatives.
- A set of strategic directions and goals were developed as a result of these meetings.
- These outcomes as well as outcomes from prior Institute planning activities are reflected in this planning document.
- The Nevada System of Higher Education (NSHE) also developed a system-wide higher education master plan in 2010. This DRI-specific document ties to the NSHE document.
- This document focuses on a five-year time frame of 2011-2015.

2. 1959 Legislative Mandate for DRI

To contribute more effectively to the security of the nation and to promote the general welfare of the State of Nevada and its citizens through the development of educational and scientific research, the Board of Regents may establish for educational and scientific research a facility within the System to be known as the Desert Research Institute. The primary purposes of the Institute are to:

- Foster and conduct fundamental scientific, economic, social or educational investigations and applied research for industry, governmental or private agencies or individuals;
- Encourage and foster a desire in students and faculty to conduct research;
- Discover and develop talent for conducting research;
- Acquire and disseminate knowledge related to the projects undertaken; and
- Promote all research within the system generally.

3. NSHE Goals

- **Student-Focused System**: The higher education system in Nevada will create a welcoming, respectful, and friendly environment where all students have the opportunity to participate and succeed at every level of higher education.
- **Reputation for Excellence**: Nevada’s institutions of higher education will increase their national, regional, and statewide reputation based on targeted, outstanding, innovative programs and other accomplishments.
- **Quality Education**: Nevada’s system of higher education will provide consistently excellent learning experiences for its students through instruction, research, and service.
- **P-16 Education**: Higher education will increase partnerships with the K-12 system to ensure the cooperative delivery of education from pre-kindergarten through college degrees.
4. DRI Mission

We excel in basic and applied research and the application of technologies to improve people's lives throughout Nevada and the world. We implement this mission by fostering scientific and engineering talent. We apply scientific understanding to the effective management of natural resources while meeting Nevada's needs for economic diversification and science-based educational opportunities.

5. DRI Vision

We seek to be the world's scientific leader investigating the effects of natural and human-induced environmental change and advancing environmental technologies aimed at assessing a changing planet. We will achieve this vision by increasing scientific knowledge and understanding of the earth's environment, promoting preservation of diverse ecosystems, advancing responsible resource management, and improving human health and welfare. To meet its mission and vision, the Desert Research Institute has developed the following institutional imperatives.

6. DRI Values

- DRI recognizes the critical importance of individual creativity and initiative to scientific achievement and supports an institutional structure that provides opportunity in a collegial environment.
- All DRI scientific and administrative operations are conducted in accordance with the highest standards in all relationships with faculty, staff, sponsors, donors and the public.
- DRI operations are based on sound environmental, health, and safety policies and are conducted in a climate of openness.
- DRI is committed to fostering partnerships with industry, government, and other academic institutions and seeks opportunities to enhance its strengths and lend expertise to others.
- DRI values its membership in the NSHE and is dedicated to furthering the goals of the system.
- DRI values its Nevada citizenship and is available at all times to provide objective and unbiased expertise and leadership in scientific research and the application of science to real-world issues.

7. DRI Strategic Goals

- **Serve as A World Leader.** DRI will serve as a world leader in environmental sciences through the application of knowledge and technologies to improve people’s lives throughout Nevada and the world.
- **Foster Scientific Talent.** DRI will foster scientific talent for the advancement of the environmental sciences and the integration of terrestrial, hydrologic, atmospheric and anthropologic sciences to provide innovative solutions and enhanced resource management.
- **Establish Active Partnerships and Collaborations.** DRI will establish active partnerships and collaborations with communities, organizations, businesses, governments and international
entities to address the most crucial environmental issues and needs identified at the state, national and global levels.

- **Provide Quality Opportunities for Research-Education Experience.** DRI will provide the highest quality opportunities for post-doctoral, graduate and undergraduate research experience; add value to Nevada’s teaching institutions by participating in graduate and undergraduate educational programs; and support the science-based educational needs of the state.

- **Leverage Scientific Innovation and Intellectual Capital Needs.** DRI will encourage technology transfer. DRI will endeavor to transfer its environmental technologies to facilitate the development of solutions for local, state, national and world environmental problems, as well as to meet Nevada’s needs for economic diversification, growth and global recognition.

- **Serve as a Model.** DRI will serve as a model to demonstrate how a combination of entrepreneurialism and sound research can strengthen a university system, a state’s economic portfolio, and society overall.

8. **Strategic Trends and Issues**

8.1 **External Trends and Issues:**

- Significant shifts in federal funding may be on-going and will reflect the current state of political uncertainty, although there will be continued emphasis on energy, environmental, and national security related research and development (R&D).

- Significant competition nationally for traditional sources of federal funding will be an on-going issue that will need to be managed.

- There are growing trends toward federal funding at lower overhead recovery rates (example, Cooperative Ecosystem Study Units, or CESU’s).

- Requirement for matching (cost-share) funds for federal agencies, other than Department of Defense (DoD), will continue.

- Potential reduction or modification of federal initiatives will be an on-going issue in the current political climate with a potential short-term trend of reduced federal initiative funding.

- There is increased competition with institutions outside the State of Nevada to recruit and retain DRI faculty due to uncertainties about the economic future and long-term stability of higher education in Nevada.

- Funding from state agencies will continue to be extremely limited over the short-term.

- The role and value that DRI plays in the State of Nevada will need to be continuous and effectively communicated and marketed.

8.2 **Internal:**

8.2.1 **Fiscal and Operational:**

- Measured slowing of revenue growth rates over the past several fiscal years due in part to attrition of DRI research faculty and state appropriations.
• Probable slowing or leveling off of growth rates over the next several fiscal years, which could affect the DRI revenue stream.

• Diversifying funding base (state, private, international) as a complement to Federal grants and contracts funding will be difficult, but must be pursued.

• Maintaining effective and sustainable research laboratory operations and meeting laboratory equipment and space needs at DRI.

It has been demonstrated that DRI’s research growth is directly correlated with the availability of new laboratory and faculty office space:

 For example, given the clear linkage between the growth of DRI’s research efforts with the availability of new laboratory and office space, there will be a need to increase space on the Las Vegas campus to address the goals of the Maki endowment.

• Determining the appropriate DRI organizational structure and business model to support development of successful research programs.

• Maintaining the appropriate IT structure in support of faculty and the overall level of competitiveness for DRI.

• There is increased competition with other NSHE institutions to retain DRI faculty (i.e., uncompensated loss of DRI faculty to NSHE institutions).

8.2.2 New Research and Business Directions:

• Improving the effectiveness and efficiency of research operations and support at DRI.

• Increasing faculty and institutional competitiveness.

• Incubating new research activities within DRI and nurturing them into programs, centers and/or divisions.

• Providing appropriate resources to our research faculty and administration that will allow them to collaborate, inspire, and innovate in new research directions and in bringing value to Nevada’s economic development.

• Continuing dialogue between administration and research faculty on the relative roles of institute initiated and Principal Investigator (PI) initiated program development for improving the overall achievements of faculty and the institution overall.

• Continuing to assess and build upon recent improvements made to the efficiency and effectiveness of DRI business operations.

• Building appropriate infrastructure for and attracting mutually beneficial businesses to the Dandini Research Park.

8.2.3 Faculty Development and Support within an Evolving Research Culture:

• Refining the means for a periodic review of current research activities, programs, and support mechanisms.

• Defining and dealing with the practical implications of establishing new research directions.

• Recruiting, retaining, and recognizing the achievements of outstanding and diverse faculty.
• Supporting faculty opportunities to innovate in areas of intellectual property and bringing innovations to the public through technology transfer.

• Establishing new faculty support mechanisms for creative and scholarly endeavors as well as for research program management and development.

• Determining the appropriate faculty role as stakeholders in a successful administration.

8.2.4 The Evolving Educational Role of DRI in the Nevada System of Higher Education:

• Review the level or extent to which DRI expands its educational portfolio; the extent that this expansion includes community outreach and K-12 education.

• Continued DRI progress with its collaborations with other NSHE institutions to bring value to educational programs and to state-wide research initiatives.

• Ensuring quality and innovative proposals and products.

• Recruiting high-quality students and post-doctoral faculty.

• Expand DRI’s collaborative efforts within NSHE, maximizing opportunities for undergraduate and graduate teaching expertise of our institution’s faculty and their ability to support and contribute to advanced degree opportunities for NSHE as a whole.

9. Key Areas of Strategic Opportunities

• Leveraging the fact that DRI has consistently been ranked in the top twenty institutions for National Science Foundation (NSF) funding for environmental science for a number of years, and that UNR and UNLV have been ranked in the top fifty institutions in this funding area.

• Exploration of new and unique research opportunities in the federal, private and international sectors.

• Building on a growing statewide, national and international reputation.

• Expansion of the educational mission.

• Expansion of DRI’s role in Nevada’s economic development and partnerships with Nevada businesses.

• Expansion of Research Park activities.

• Growth and leveraging of technology transfer.

• Potential partnerships and business opportunities with Nevada corporations (i.e., GE Energy, Renown, and IBM), national institutions of higher education (i.e. University of Arizona Biosphere2), private institutions (i.e., Sierra Nevada College), and international universities and institutions (i.e., Hohai University and Chinese Academy of Sciences).

• Develop NSHE state-wide collaborative initiatives in health sciences and renewable energy.

• Implementation of a System-wide Enterprise Resources Planning system.

• Enhancing research efforts related to national security.
• Integrating engineering with DRI’s traditional science areas to enhance the advancement of technology, methodology, and policy to solve the integrated global problems of climate change and sustainable natural-resource development.

10. Operational Approach to Program Development

Since there is no shortage of issues facing our nation and planet, there are also opportunities to provide DRI expertise in evaluating and resolving these issues. The following is a set of tactics that allows for better focus on obtaining funding for DRI research activities.

• Identify energy, environmental and national security issues facing the nation and planet that are of interest to DRI. As DRI can’t do everything, these issue areas should be focused on DRI strengths, as well as new areas for which DRI has sufficient emerging expertise.

• Evaluate DRI strengths in these areas and pursue activities in program areas that play into these strengths or provide us with opportunities to strengthen our skill set.

• Based on this analysis of issue areas and DRI strengths, determine which funding agencies have missions related to these issues. Evaluate their current funding levels in the areas in which we are interested and determine which organizations are funded by each agency.

• Based on this analysis, develop interactions with members of these agencies. When possible, take advantage of existing funding agency relationships and contacts. These initial meetings should focus on getting acquainted and determining the directions of their funding and program interests. This can be an opportunity to assess our competition’s strengths.

• After obtaining these data, evaluate chances of DRI success. Since DRI will not be able to pursue all leads, realistic assessments of success must be made. There are three general outcomes for this assessment:
  ➢ Decline to pursue an area of interest or agency, if the competition is too strong and/or funding in this area of interest is lacking;
  ➢ Decide that we want to pursue a particular initiative area, but conclude that we need to partner with another organization in order to increase our chances of success;
  ➢ Conclude that we are sufficiently strong in a particular area of interest and will organize internally to obtain funding without any additional partnerships.

• While DRI strengths lie in developing written proposals, there is a continuing need to develop personal relationships with management and staff of funding agencies that we are pursuing. This must include the determination of who the decision-makers are in the organization. This is not always apparent from examining an organization chart.

11. DRI Strategic Directions

The preceding section is an approach that has been successful in identifying funding agencies and developing funded programs with those agencies. The following section provides a strategic analysis of opportunities that match DRI skills, experience, and expertise with regional, national, and international issue areas. These strategic opportunities are divided into six tracks, each with two tiers. Areas shown under Tier 1 are DRI’s highest priorities, with enhancements occurring within the next
two years. Areas shown under Tier 2 are DRI’s secondary, but also important, priorities. Enhancement of these areas will occur on an ongoing basis over the next five years.

Track 1: The Environmental Research Mission

DRI will make significant, measurable enhancements to the basic and applied environmental research mission of the Institute through expansion of DRI’s core research programs as defined below.

Actions

Tier 1

- **Addressing environmental and societal impacts of climate change and related security implications**

  DRI will expand its research expertise on the impacts of climate change on those natural resources (in Nevada and other western states) with an emphasis on water resources in collaboration with key water authorities (e.g., Southern Nevada Water Authority (SNWA)), as well as with state, federal, and international agencies and organizations. A better understanding will be developed in how to manage scarce water resources because of changing climatic conditions. A key component of this effort will be the examination of climate change impacts on the water/energy nexus. In doing so, DRI will examine:

  - the impacts on energy generation and use caused by water scarcity;
  - the impacts on energy use caused by the increased delivery and treatment requirements of water; and
  - Monitoring ecological, hydrological, and atmospheric effects of climatic changes in the region.

DRI will expand its research expertise in quantifying the effects of climate change on ecosystems. This expansion in ecosystem research will help to better evaluate and manage ecosystems experiencing changing climatic conditions. Key components to this effort will include quantifying ecosystem behavior in response to changes in the CO2 levels, precipitation, air temperature, and other climatic changes. DRI will collaborate with key private sector organizations and state and federal agencies to help better understand and manage ecosystems.

DRI will continue to expand its research using and developing proxies for assessing global climate trends. This expansion of capabilities will include analysis of ice cores, sediments, and rocks. DRI will also expand its investigation of recently reported findings that particulate matter in the air inhibits precipitation formation.

DRI will further its research into the ways in which natural systems and human society and infrastructure must adapt to climate change. These efforts will utilize results from paleo-climatic research examining climate changes on earlier civilizations. These efforts will also include expanded emphasis on the inter-relationship between climate, aridity, and fire that will utilize DRI fire science capabilities.
As part of DRI’s focus on climate change projects, we will continue to develop its atmospheric modeling and measurement capabilities, including specific research efforts on cloud chemistry and physics and on aerosols.

Many climate-change related research activities are inherently connected to regional and national security issues. Conflicts over lack of water may arise in many parts of the world. On a regional level, similar conflicts will become extremely litigious. In either case, information on water use and availability will be critical. For carbon emissions, these issues are linked to our dependence on foreign energy supplies. Examination of climate impacts and reduction of CO\textsubscript{2} emissions will also lead to security and financial benefits for the country.

The requirements for all of the research under this action, as well as other actions in both Tier 1 and Tier 2 will necessitate our continued excellence in the development and deployment of environmental analytical instrumentation.

- **The interactions between environmental conditions and human health**
  
  DRI will build its research portfolio expertise by capitalizing upon DRI scientific expertise and instrumentation development capabilities in subject areas related to:
  
  - Fugitive dust, airborne particulates, and dispersion patterns that have direct relevance to respiratory problems apparent in parts of Nevada and in arid regions in other parts of the country and the world;
  
  - Ecology of infectious disease, using advanced techniques in remote sensing and geospatial analysis to understand how pathogens, vectors, and hosts move across landscapes under different environmental conditions;
  
  - Microbial ecology, examining bacterial, fungal, and algal pathogens including those responsible for harmful algal blooms, a growing environmental hazard;
  
  - Modeling and predicting human and ecological exposure to contaminants transported by groundwater; and
  
  - Molecular biology, including the quantification of genome architecture in pathogens and free-living microbes.

- **High performance computing and advanced visualization**
  
  DRI will enhance its focus and proficiency in high performance and visual computing as investigative and pedagogic instruments for understanding and explaining natural processes and the influence of human activity. High performance computing leverages advanced computing hardware and parallelism to simulate and analyze complex systems, especially involving large, numerically intensive or time critical problems. Advanced visualization involves the use of interactive technologies and human-in-the-loop computing to enable discovery, training outreach and remote presence. Together, these capabilities enable researchers to model systems, synthesize virtual environments, validate theories, predict phenomena or explore large databases populated from field sensors.

  DRI will expand its research portfolio expertise by focusing on problem-solving projects in selected technical areas by:
Researching and developing technologies in scientific computing, imaging, data analytics, cyber physical systems, physically based graphics, and computer interfaces for the enhancement of environmental science research;

- Leveraging state-of-the-art hardware and software for computation, visualization and virtual reality;

- Providing technical expertise and outreach in computing, visualization and virtual reality software and techniques; and

- Establishing collaborative efforts with other DRI and NSHE faculty as well as the business and services community of Nevada.

**Clean energy systems and technologies**

DRI will intensify its efforts in clean and alternative technology that will address two national and international issues:

- The reduction of greenhouse gases being emitted into the atmosphere; and

- The concomitant utilization of indigenous energy resources to reduce dependence on foreign energy.

DRI will expand its research and technology development portfolio in several areas including, but not limited to:

- Evaluating demonstration and deployment of new renewable energy systems in the southwestern U.S.;

- Supporting the transition of end-use energy efficient technologies from household to community applications through the development of demand response systems;

- Leveraging DRI’s energy laboratory, including integrated renewable energy (indigenous renewable resources, energy storage) systems for off-grid applications;

- Utilizing ecological and geotechnical expertise for evaluating carbon sequestration opportunities;

- Implementing and obtaining funding for the new Clean Technologies and Renewable Energy Center (CTREC); and

- Leading and collaborating in NSHE’s newly established Nevada Renewable Energy Consortium (NREC).

**Military geosciences**

DRI will enhance its ability to assess interactions between critical military operations and the terrestrial and near-surface atmospheric environments, including the impact of military operations on the environment (i.e. range sustainability) and the impact of environmental conditions on military operations (e.g., mobility, counter Improvised Explosive Devise (IED)). On-going and expanded support for these projects will focus on funding from the Department of Defense and its prime contractors. DRI will also expand its research on assessing the human and ecological toxicity of munitions, other energetic compounds that are used within training facilities that may be released to the environment during military operations. These efforts will include the evaluation of the potential impact of airborne mineral dust on human health. Research will also include
the fate and transport of depleted uranium in arid environments and research on releases of energetic byproducts at defense facilities.

**Tier 2**

- **Integrated natural resources evaluation**

  DRI will strive for a leadership position in the integrated assessment and sustainable management of natural resources in urbanizing arid regions. This approach will include the substantive integration of concepts from social sciences and significant efforts in developing decision support systems to better inform the public at large and governmental decision makers in particular.

- **Issues involving international water development; availability, quality, and international conflict**

  DRI will build upon its expertise and experience in national and international water projects to promote sustainable water quantity, particularly in regions of the world with similar water availability issues as the American Southwest, while ensuring adequate water quality for developing countries throughout the world. In addition, DRI will work on international issues involving national water rights and related conflicts.

- **Atmospheric scientific research to resolve pertinent homeland security, nonproliferation and public health and safety issues**

  Building on its long-term success in monitoring environmental variables (e.g., CO2 atmospheric aerosols and pollutants, natural and man-made radiation, and meteorological variables that affect their concentrations) and modeling their distribution, DRI will expand existing research to include monitoring and modeling related to homeland security and climate change interests, including early detection and multivariate analyses of complex data. In addition, DRI will further its collaborations on nuclear nonproliferation research that has included U.S. compliance with terms and conditions of the Comprehensive Test Ban Treaty; will expand its research in forecasting natural hazards such as extreme weather events; and will support effective notification of the public of such conditions, which is an objective of its ongoing research for National Oceanic and Atmospheric Administration’s (NOAA) Remote Community Alert System Program.

- **Life in extreme environments and astrobiology**

  DRI will coordinate its existing and future research effort focusing on life in extreme environments and astrobiology with the goal to establish an institute-wide program. In addition, DRI will coordinate efforts between the various NSHE campuses working towards a statewide program that will include both research and teaching.

**Track 2: Beyond Research - Education, Policy and Economic Development**

DRI will explore opportunities and implement procedures: (1) to expand its academic mission with NSHE; (2) to enhance the economic development of Nevada through mission-related services and spin-offs in support of faculty, intellectual property development and developing equity positions in spin-offs; and (3) to emphasize project efforts whose scientific results are policy-related and enhance the state economy and the management of our natural resources.
Actions

For over 50 years, DRI has fostered scientific talent for the advancement and integration of environmental science that has implications for economic development. DRI will expand this focus by significantly enhancing: (a) academic/educational accomplishments; (b) applied services, equity, and spin-offs; and (c) areas of relevant policy and decision making (Figure 1). Establishing innovative and collaborative approaches in support of scientific talent and building new innovative mechanisms in support of this talent requires that DRI expand its portfolio of business activities.

**Figure 1.** Illustration of the expansion of DRI’s core research activities into academic programs, services based upon intellectual property and research activities with policy relevance while maintaining the institution’s basis in the environmental sciences and related fields.

DRI will maintain its reputation for the highest quality, unbiased scientific results while building the institution’s portfolio to include enhanced academic programs, research services, and related spin-off activities that will be driven by policy-related scientific results. These plans will include but are not limited to the following areas:

- Provide the highest quality opportunities for post-doctoral, graduate and undergraduate research experience and adding value to Nevada’s academic institutions.
- Establish innovative and collaborative approaches to academic programs within NSHE and enhance DRI’s faculty participation in academic programs that will include the following:
  - **Tier 1**
    - Expand strategic partnerships with UNR and UNLV, as appropriate, including activities in renewable energy, climate change, the health sciences as well as the establishment of a statewide program in hydrologic sciences.
- Maintain a focus on the DRI/Las Vegas facility by developing a plan to enhance hiring and ensuring that the campus is a key component of the overall DRI efforts.
- Provide critical support for post-doctoral programs that bring the brightest minds to DRI and to the State of Nevada.
- Develop effective mentoring programs for all post-doctoral fellows and beginning research associates and professorial faculty, with special consideration given to serve persons from under-represented groups.

Tier 2
- Work with UNR to re-invigorate the Atmospheric Sciences program and develop a mutually agreed upon plan for increasing enrollment.
- Build strategic partnerships with Nevada State College (NSC) and the community colleges that complement DRI’s and the colleges’ missions by creating opportunities for technical training in job-related areas that are technically challenging and in short supply.
- Continue to develop mission-related seminars, workshops and short courses for national and international audiences.
- Expand educational opportunities for undergraduate, graduate and post-doctoral students using resources from the state legislature.
- Incorporate basic and applied research into teaching environments for all programs and educational activities.

- DRI will build upon existing faculty financing and other support mechanisms and develop new methods for recruiting and retaining faculty. This will require providing opportunities for utilizing their knowledge and intellectual property to provide services and to develop spin-offs related to their knowledge and products. Specific initiatives will include the following:

  Tier 1
- Continue to facilitate formation of faculty spin-off companies by either fast-tracking licensing agreements or by taking equity positions in those companies.
- Provide entrepreneurial leave to faculty directing Small Business Innovative Research/Small Business Technology Transfer (SBIR/STTR) projects.
- Assess the use of the Desert Research Corp (DRC), a subsidiary of the DRI Research Foundation, as a for-profit organization to: (a) provide an opportunity for faculty to provide services outside of the DRI research structure; and (b) be used as a vehicle for appropriate grant and contract applications.

  Tier 2
- Continue to build the restructured technology-transfer operations and expanding efforts to market DRI’s intellectual property to create a viable revenue stream; in doing so, establish a more structured procedure for licensing and non-disclosure agreements.
- Improve the awareness of faculty about important terms and conditions of non-disclosure agreements, contracts, and memoranda of understanding to both protect DRI intellectual property while also promoting effective collaborations with other organizations.
A natural consequence of providing innovative solutions to environmental challenges, enhancing resource management, and addressing related economic issues is the application of such results to improve policies that impact the state, nation and world. DRI’s policy-related initiatives will include the following:

**Tier 1**

- Develop project plans that will lead to effective collaborations with governmental policy agencies that will provide actionable information for their policy decisions.
- Expand opportunities with policy-focused consulting organizations. For example, DRI is working collaboratively with the Research and Development Corporation (RAND) to explore new water resources decision-making models for embracing the complicating consequences of climate change in the urbanizing western U.S. DRI will also work with UNLV to evaluate the most effective means for collaborating with the Brookings Institute.

**Tier 2**

- Develop decision support programs at DRI that are oriented towards providing governmental and non-governmental organizations with information and recommendations that can be utilized in policy development and implementation.
- Provide continued and enhanced activity in areas of policy management conflict (e.g., Lake Tahoe, Walker River and issues related to climate change).

**Track 3: Financial Support**

DRI will continue to grow through building and enhancing its financial resource base in support of its mandate, mission and vision.

**Actions**

DRI’s administration will support the necessary steps to maintain financial stability and to establish new revenue sources for innovation and advancement. Such steps will take into consideration the fact that the research faculty will continue to generate, through indirect cost recovery, a significant portion of the total operating dollars available to DRI. The steps include:

**Tier 1**

- To help improve the competitiveness of DRI with foundational, private sector and selected federal research activity, develop alternate cost recovery models.
- Continue to move forward with its fundraising activities involving enhanced activities of the DRI President, Vice President of Development and the DRI Foundation. For example, the DRI Foundation, in consultation with DRI administrative leadership, has completed and will implement a three-year fundraising plan; definitive short-term and ideal long-term fundraising and programmatic goals have been identified; and the Board of Trustees is being recruited specifically for their fundraising prowess and giving capacity. DRI will also continue to work closely with state agencies to keep them abreast of DRI’s accomplishments related to fundraising and development.
• Continue to work closely with members of Nevada’s Congressional delegation to ensure that DRI is working on relevant projects for the state and for the region. This will require broadening our efforts in Washington and in continuously assessing program activities in ensuring that these also add to the expertise of DRI. This will include the continued execution of a rigorous process of evaluating DRI federal initiatives.

• Develop an approach that will provide for more direct communication with existing and potential federal sponsors. This will enable DRI to obtain funding through unsolicited sole-source grants and to be better positioned for competitive solicitations.

• Continue to develop the DRI Research Park; this includes, at minimum, the following steps: (1) complete a Research Park Master Plan; (2) develop a business case statement; and (3) leverage the master plan and case statement for additional federal and public/private partnership funding for building the infrastructure.

• Assess the business models used for DRI laboratories; as appropriate, update current laboratory business models to ensure the fiscal stability of these laboratories. The assessment will include: (1) a review of various models of financial support available for laboratory facilities and operations; and (2) the appropriateness of these models to the laboratories at DRI.

• Continue to emphasize the application of state and indirect cost recovery funds toward the support of DRI research activities; the desired outcome is to strategically provide research faculty with the types and level of support that promotes their ultimate success.

Tier 2

• Strategically expand its fundamental research mission into appropriate private and international sectors. This will require development of partnerships with private sector organizations that will need DRI expertise in working on international activities.

• Assess the readiness of DRI, the DRI Foundation, and its donors to successfully plan, implement and complete an institute-wide comprehensive capital campaign in the multi-million dollar range; prioritize the institute’s fundraising goals for that campaign in correlation with this strategic plan; and secure the commitment of DRI resources and leadership to the campaign.

• Establish strategies for measuring effectiveness of existing federal initiative programs with the intention of growing, sustaining or exiting the programs. Review and assess the current DRI business model to best position DRI for the current and future economic environments; this will include a review and assessment of the current indirect cost rate allocation strategies, focusing upon the relative distribution of such funds to research divisions and central administration and the institutional ability to address new, large and/or unique scientific program opportunities.

Track 4: Institute Administration

DRI will continue to: (1) assess processes and organizational structures that maintain an efficient and effective administration; (2) build its support for faculty development; and (3) continue to foster diversity in its faculty and staff and through collaborative efforts.

Actions

DRI will seek efficient processes and effective organizational models in the following ways:
Tier 1

- Develop and implement an ongoing comprehensive upper level evaluation process for vice presidents, executive division directors, assistant vice presidents and administrative directors; this will include both internal and external components; seek faculty involvement and input on all NSHE led or sanctioned evaluations of the DRI president.

- Establish and/or continue to implement processes for reviewing the different approaches and/or models related to program initiation, development, and evolution, including DRI’s Department of Energy (DOE) and Department of Defense (DoD) programs, Integrated Science Centers, and other types of centers. The review process will include: (1) an assessment of the use of federal and the Experimental Program to Stimulate Competitive Research (EPSCoR) initiative funds for program development and the sustainability of these programs; (2) the role of faculty mentoring and other support mechanisms in creating sustainable research programs; and (3) update the formal Integrated Science Center review process initiated in 2009 with the review of two centers. This will ensure accountability while including the opportunity for new ideas to surface; this review process will incorporate a center evaluation model developed by the DRI Research Advisory Council (RAC).

- Develop and implement strategies and initiatives to enhance internal communication and external presence. These include the following:

  **External Communication Plan**

  The long-term goals of this effort are to: (1) provide a definitive template of how DRI will promote itself to raise the profile of the institution; (2) enhance the mission and complement the development efforts of DRI; and (3) create an awareness of the work being done by DRI faculty through new media sources and public and media relations strategies.

  **Internal Communication Plan**

  DRI will develop a plan to enhance faculty and administration communication and make it more effective and deliberate. This includes the development and implementation of comprehensive data bases for all DRI publications and proposals that have been submitted by DRI to funding organizations.

  **Outreach**

  DRI will develop new outreach efforts and will expand on current efforts, which include the GreenPower program and the DRI Speakers Bureau.

  DRI will also continue to utilize appropriate and effective internal and external media to highlight the accomplishments of DRI faculty and staff.

- Continue to build a diverse faculty and staff through the goals and objectives of the DRI Diversity Plan. This plan includes:
  - Foster a campus environment that respects differences and encourages inclusiveness;
  - Increase the recruitment, retention, and representation of underrepresented groups;
  - Build and strengthen partnerships with diverse communities that include education and business, civic and other community organizations; and
Develop and execute a comprehensive diversity communication plan.

- Continue to build on a successful implementation of the Chief Information Officer (CIO) structure for the administration and implementation of information technology and services.

**Tier 2**

- Review and redesign organizational aspects and changing management structure and processes in response to faculty feedback.
- In the context of current State of Nevada funding realities, review existing staffing levels with a concomitant strategic allocation of resources to ensure an adequate staff support in mission-critical aspects of our core business.
- Continue to refine and update the internal budgeting process.

DRI will support faculty development through the following actions:

**Tier 1**

- Assess and evaluate the current senior faculty support model to determine its success and for possible expansion of the faculty ranks to include those not currently included in the support.
- Work to develop simplified and targeted evaluation (MBO) processes for research faculty that are better tied to the promotions process. These processes will also be more concise and tied to actionable information to help faculty in their future technical growth.
- Develop a strategy and prepare for the next five-year institutional review by the National Science Advisory Committee (NSAC). In doing so, DRI will build upon its current external review process in a manner that involves: (a) the existing separate external reviews of each of the three research divisions over a three-year period; and (b) a synthesis of the divisional reviews with an institutional self-assessment involving the overall institutional administrative operations of DRI.
- Support informal and formal mentoring of new and “junior” research faculty members by “senior” research faculty.
- Implement an optimal faculty funding mechanism that includes an assessment and review the appropriate levels of faculty start-up and ongoing support for recruiting and retaining faculty.
- Continue to work collaboratively with the DRI Faculty Senate and Technologist Advisory Council to establish effective and appropriate roles in institutional shared governance.

**Tier 2**

- Build on existing faculty support mechanisms and develop new support mechanisms.
- Develop the means to conduct periodic internal and external reviews of current research activities.
- Define and effectively manage the practical operational and fiscal implications of establishing new research directions.
- Assess the current evaluation (MBO) process with the goal of streamlining the process, making it more efficient and effective, and making it web accessible.
- Develop and implement an effective institute-wide calendar.
Track 5: Facilities and Infrastructure

DRI will strategically expand its research facilities as defined by the institution’s Facility Master Plan to provide state-of-the-art research laboratories and associated equipment, critical office space, and space for current and future outreach programs. DRI will use a combination of state, internal and private sources to expand its physical plant. In doing so, DRI will demonstrate leadership by incorporating sustainability into the design and operation of all of its facilities. Strategies to embrace sustainability efforts will be based upon the expectation that necessary short-term investments will lead to potential long-term savings. Therefore, all of the facilities initiatives presented below will make environmental sustainability a primary goal.

DRI recognizes that building and maintaining large-scale research facilities, including laboratories and equipment, require planning, ongoing investment and stewardship to ensure that the value of the original investment is maximized and the operating potential of the equipment is realized.

Actions

Tier 1

• Determine and implement an appropriate and cost-effective strategy for upgrading large-scale research facilities. The DRI Foundation will seek, in concert with its overall funding priorities, private support for DRI facilities such as the following: the Weighing Lysimeters in Boulder City, NV; the Storm Peak Laboratory facilities in Steamboat Springs, CO; and the Fritz Went Laboratory and the DRI Visualization Environment Six-sided (DRIVE6) – both in Reno, NV.

• Expand the Las Vegas (SNSC) campus as an essential component of providing the necessary facilities for the statewide water assessment program; and expand human environmental health research through the NSHE Health Sciences Initiative.

• In conjunction with the Renewable Energy Experimental Facility (REEF), determine the feasibility of, fund, design and build a new anchor building for a renewable energy complex.

• Assess opportunities to expand its physical base in Nevada through collaborations with NSHE partners and with private businesses.

• Improve the research capabilities of the Boulder City Research Station.

Tier 2

• Assess the possibility of building an auditorium complex in conjunction with TMCC on the Reno campus to enhance educational and public outreach activities for both institutions.

Track 6: Comparative Peers

Background

DRI’s strategic approach to peer institutions falls into two key areas: (a) establishing peer institutions for future NSHE and Legislative purposes; and (b) assessing the role of an aspirational peer for internal
indicators measurements and external competitive purposes. Peer assessment of higher education institutions has been critical component of Nevada State Legislature funding formula assessment. In 1999 and 2000, the Legislative Committee to Study the Funding of Higher Education incorporated a consultant’s study to identify peer institutions for the NSHE institutions. The study emphasized that the quality of peer institutions can be judged only in reference to some outcome and that the basic question in peer establishment is “peers for what purpose.” The study further asked the question as to what is the State “trying to learn from peer institutions in the case of DRI.” Establishing peer institutions will continue to be critical in the future as a means for DRI to strategically address this issue.

In 2002, Institutional strategic planning was initiated under the leadership of Dr. Art Anderson, DRI Foundation Trustee Emeritus, who has lead several strategic planning efforts at IBM Research. Based upon this experience, it was determined that the development of peer institutions is a key element for a successful strategic plan. Peer institutions can be critical in serving as aspirational, performance and competitive peer comparators. However, the peers selected must reflect the needs and characteristics of the Institute.

**Actions**

**Tier 1**

- Periodically assess those institutions that have attributes that could serve as comparable organizations with DRI based upon their mission, research functions, administrative operations, and fund-raising strategies.

**Tier 2**

- Review the suitability of the Woods Hole Oceanographic Institute as a possible aspirational peer; the review will involve representatives from DRI administration and faculty and the DRI Foundation.