1. Statement of Need

How does the project strengthen the Museum's ability to serve its public?

The Denver Museum of Nature & Science (DMNS) proposes to conduct a risk assessment that will significantly improve its collections stewardship. The project will evaluate hazards to collections in storage, and is an essential step in a larger process that will result in safe and more accessible storage of the one million objects the Museum holds in public trust.

Object-based collections provide the fundamental infrastructure for contemporary and future scientific advancements. Since it was founded in 1900, the DMNS has been the principal museum preserving the natural history, biodiversity, and cultures of the Rocky Mountain Region. The Museum's collections (see Attachment A) represent much of what fascinates people about the American West—from its spectacular geology to its amazing dinosaur fossils and unique wildlife, to its indigenous peoples. Through its collecting efforts, the Museum promotes opportunities for the public to analyze, interpret, and evaluate issues related to our natural resources and human and planetary wellness.

Unfortunately, only a small fraction of the collection is currently available to the general public despite a high level of interest for behind-the-scenes access. The Museum's collections in storage are inefficiently scattered in 49 locations (see Attachment B). Only one of these storage areas has conditions that meet optimal museum standards. The remaining 48 are crowded and lack one or more of these critical features: fire detection and suppression systems, centralized security, and temperature and relative humidity controls. Overcrowding impedes best practices, such as routine monitoring for pests and object condition. These storage conditions jeopardize the long-term stewardship of the collections (Heritage Preservation, Inc. 2005). Additionally, in the event of fire or other disaster, these areas have limited egress, putting human safety at risk. There also is little adjacent space for important activities such as collections processing, volunteer work areas, and research.

Through a series of IMLS Conservation Project Support grants, the Museum has targeted key segments of the collection, moving them to the Museum's one optimal storage area and rehousing them in quality cabinets with customized storage mounts. These improvements are significant, but cannot address the underlying constraints of the storage areas themselves. The risk assessment proposed will lay the groundwork for tackling the larger need to store the entire collection in conditions that achieve stewardship standards and are more accessible to the public.

How does the project relate to DMNS mission statement and strategic plan? How were they developed?

The Museum's mission is *to inspire curiosity and excite minds of all ages through scientific discovery and the presentation and preservation of the world's unique treasures*. Both the mission and the Strategic Plan explicitly recognize the significance of collections and the importance of their stewardship and availability to the public (please see the highlighted sections of the attached Strategic Plan Summary). The need for a collections risk assessment flows from the thorough strategic planning process described below.

The DMNS is governed by a 25-member Board of Trustees whose responsibilities include setting the Museum's strategic direction in concert with its mission. Early in 2004, the Board of Trustees charged its Strategy and Planning Committee with initiating a new Strategic Plan. As a key element of the strategic planning process, the Museum's President, Vice Presidents, various Trustees and collections staff visited 17 museums in North America and Europe to explore current practices among museums. The Committee then conducted a thorough audit of the Museum's institutional capacity, including its collections stewardship, public access to collections, research programs, public programs, finances, facilities, and human resources.

The Committee also endorsed a bottom-up, highly inclusive planning process. Staff and volunteers contributed significantly to the renewal of the Museum's mission, vision, and values. The Museum's 50,000 members were

sampled through outside market research for their opinions regarding the DMNS's strengths and areas for improvement. A select group of community organizations and major donors were consulted, as were outside experts including the state demographer and a panel of science experts.

The above process resulted in the 2006-2015 Strategic Plan (see attached summary). The Plan contains ten major initiatives, including a Collections Initiative. The objective of the Collections Initiative is to upgrade the storage conditions to optimize preservation and space utilization, and to increase public access to collections.

In 2006, the Museum engaged an architectural consulting firm to evaluate what changes would be needed to implement the Collections Initiative. The architects documented that consolidating and improving collections storage within the Museum's current footprint would require the removal of a substantial number of historic dioramas. When this idea was tested with Museum stakeholders, it was strongly resisted because of the public's affection for these historic treasures. The architects then recommended that a new collections storage facility be constructed adjacent to the existing Museum (see Attachment C) as a cost-effective means to achieve the objectives of the Collections Initiative.

A Collections Initiative team has been established that includes registration, curatorial, collections management, and conservation staff. Through networking with colleagues and attending professional workshops, this team has identified the risk assessment as a crucial next step in implementing the recommendations of the Collections Initiative. The risk assessment will identify and calculate the magnitude of risk, and prioritize risk reduction strategies that will inform building specifications and resource allocations.

How does the project serve as an investment in institutional capacity?

The Museum recognizes collection stewardship and public access to collections as institutional strategic goals. In 1988, the DMNS completed a general facility survey that recommended improvements in collections care and storage. Over the past nineteen years, the Museum has implemented the recommendations from the survey, including increasing the number of collections management and conservation staff and developing a Long-range Conservation Plan that focuses on preventive conservation strategies. With grants from IMLS, the Museum also has improved conditions for targeted collections in storage.

Building on these early successes and the strategic planning process described above, the Museum has identified risk assessment as a key mechanism to increase institutional capacity in order to ultimately accomplish the construction of the new collections storage facility. The eventual construction of the new facility will provide safe and contiguous space for collections storage, research, and programming for public access in the way that the existing building infrastructure does not allow.

Who is the audience and how will the project serve them?

The internal audience for the project includes the Museum's collections, security, and building operations staff. The risk assessment process will provide them with the training and knowledge they need to work effectively with architects during the design and construction of the new collections storage facility. It also will assure the administration and Trustees that project staff have explored the challenges and have the tools they need to communicate with the architects effectively regarding the efficient use of resources. Development and Finance staff are involved because they also have responsibilities related to the collections.

The project's external audience is the general public whose collections the Museum holds in trust. This project will help the Museum develop and implement institutional strategies for reducing risk that address management, stewardship, and public access goals to ensure that collections are maintained in perpetuity.

What are the demographics of the area; how do they fit within the strategic plan?

The DMNS primarily serves the Denver metro area and the state of Colorado. In 2006, 90% of Museum's visitors resided in Colorado state, and approximately 70% in the Denver metro area. The demographics of the area are changing, and the Museum actively strives to understand and meet the needs of these new audiences

through the use of internal and external evaluation, partnerships with schools, special events, and multilingual exhibit guides. Museum stakeholders participated in the strategic planning through surveys, and advisory panels. The U.S. Census Bureau (2007) describes the demographics of Denver and Colorado as follows:

	City and County of Denver	State of Colorado
Population	557,000	4,750,000
% Hispanic	31.7%	19.5%
% non-Hispanic	68.3%	80.5%
% White	65.3%	90.3%
% Black	11.1%	4.1%
% Asian	2.8%	2.6%
% American Indian	1.3%	1.1%

2. Project Design

Project activities and overall goals

The DMNS requests an IMLS Museums for America Collections Stewardship grant of $103,971 for a 12-month project to complete a risk assessment for its collections in storage. During the architectural evaluation discussed above, the Collections Initiative team recognized the need to develop site-specific collections priorities for future incorporation into building specifications. The proposed risk assessment will articulate these priorities. Project goals and activities are consistent with the DMNS collections management and preventive conservation philosophies, and the project ranks as the highest collections priority in the Museum's Strategic Plan (see attached Strategic Plan Summary).

Major project activities include: 1) hire and orient project consultants; 2) train project staff; and 3) complete a risk assessment for all DMNS collections in storage (see Schedule of Completion). Project management, evaluation processes, outreach plans, and scholarly and community involvement are also discussed below.

1. **Hire and orient project consultants**
   - Complete DMNS contract for consultant Rob Waller and his team from the Canadian Museum of Nature. The risk assessment method will incorporate procedures established by Waller (1994; 1999; 2002).
   - Conduct a one-day, on-site orientation for consultants prior to training so the consultants can meet the DMNS project staff and view the 49 collections storage areas.
2. **Train project staff in risk assessment method**
   - A two-day general principles training taken by all project staff will introduce the risk assessment method and the agents of deterioration that are responsible for risks. These agents are physical forces, theft and vandalism, fire, water, pests, contaminants, light, incorrect temperature and relative humidity, and dissociation of management data (Michalski 1990; Waller 1995).
   - A three-day intensive training will lead key staff through the exercises of determining collections significance, calculating magnitude of risk, and prioritizing risk reduction strategies. These key staff will help facilitate the risk assessment method for other staff.
3. **Complete a risk assessment for all DMNS collections in storage**
   The risk assessment will occur over four phases, each phase encompassing a major portion of the collection—Anthropology, Earth and Space Sciences, Zoology, and Library & Archives (see Attachment A).
   - **Establish collections context and significance**: Context includes collecting history, current and future research goals, preservation history, and public access needs. Staff will draw upon collection plans developed during 2007 and the Long-range Conservation Plan. An important aspect of the exercise will

be the determination of the significance(s) of each collection. Significance will include artistic, historic, scientific, religions, or social attributes (AIC Definitions of Conservation Terminology 2006).

- **Identify collections risks**: Staff will identify generic and specific risks to the collections, as well as the agent of deterioration responsible for the risk to that collection. A sample risk assessment from the Canadian Museum of Nature's Natural Heritage Building has been included (see Attachment E; Waller 2000). Staff will also identify the frequency and severity of the risks, with frequency ranging from rare to constant and severity from mild to catastrophic (Waller 2004).
- **Calculate magnitude of risk to collections**: Calculating the magnitude of risk (Waller 2004) will help the Museum rank risks by relative importance and compare the various risks among different collections. To calculate magnitude of risk, four variables are multiplied together as follows: **MR = FS x LV x P x E**. In this equation, (MR) equals the magnitude of risk and fraction susceptible (FS) is the portion of the collection that would be impacted by a loss in value (or significance). Loss in value (LV) is the maximum possible reduction in current or future use. Probability (P) is the chance of a risk occurring within 100 years. Extent (E) is the measure to which a specific risk will result in loss of value to the fraction susceptible of a collection over a 100-year period.
- **Prioritize strategies for reducing risk**: Prioritizing strategies for reducing risk will help the Museum balance cost-effective and efficient collections management, preservation, and access goals. Four major preventive conservation methods for reducing risks will be examined: avoid, block, detect, and respond (Michalski 1990). These methods can be implemented at different levels within an institutional setting (e.g. site, facility, room, cabinet, collection/object, and policy and procedure).

Project management

The project is designed so that the training, followed by the four phases of risk assessment, can be accommodated within research and exhibit schedules. This schedule will allow the maximum number of DMNS staff to be involved, so that their broad collections expertise can be utilized. Facility and collections data will all be coordinated through the Assistant Registrar, under the supervision of the Project Director. All project staff will maintain monthly timesheets reflecting their time commitments on the grant. The Collections Grant Administrator will track IMLS funds and the Museum's match requirements.

Evaluation processes; process for corrections and adjustments throughout the project period

The project activities will be evaluated by the Evaluation Manager who will ensure that the risk assessment is implemented systematically across the varied collections. The Evaluation Manager will participate in portions of each training and then meet with project staff before each assessment phase to clarify assumptions, especially in the areas of identifying collections significance, calculating the magnitude of risk, and prioritizing risk reduction strategies. The Evaluation Manager also will meet with project staff after each assessment to record improvements that can be implemented in subsequent phases. Discussions of necessary improvements will occur in monthly Collections Management and Preservation Committee meetings.

Outreach plans to reach the intended audience(s)

The internal audience of this project is the DMNS project staff. The external audiences are the general public and scientific community. The DMNS will distribute the final risk assessment report to the consultant and project staff. Additionally, a copy of the report will go to the Museum's administration, which is accountable for the allocation and responsible use of resources, and ultimate facility design and construction. Copies of the report will also go to Development and Marketing, two divisions that have been central to communicating with the public about the need for a new collections facility. Project staff will give a presentation at a DMNS All Staff meeting (which is open to volunteers and the general public), to the Senior Leadership, and Board of Trustees. Information about the project will be shared with ICCROM, CCI, and AIC (organizations that host risk assessment workshops) and with other appropriate organizations such as AAM.

Scholarly or community involvement in content, planning, or execution

The consultant, Robert Waller, is a leading expert in conducting risk assessments and has facilitated workshops and assessments for institutions and collections similar to the DMNS (see Project Staff and Consultants Resumes). In preparation for this project, key DMNS project staff attended professional workshops on risk assessment (Waller 2004; ICCROM-CCI 2006) and on museum design and construction (SPNHC 2007). Information from these resources has been presented to the DMNS Collections Management and Preservation Committee and to Research and Collections curators, who will all participate in the project. Other Museum stakeholders participated in the strategic planning process described above through surveys and focus groups.

3. Project Resources: Time, Personnel, Budget

Time

The project will take place from 10/1/08 to 9/30/09 (see Schedule of Completion). The project start date was selected to accommodate the consultants' and staffs' schedules. The consultant orientation and staff training will be conducted in November of 2008. The launch of each collection's risk assessment will correspond with an on-site visit by consultant Robert Waller, scheduled for November of 2008, and January, February, and March of 2009. Evaluation will be a continuous process throughout the project. Reporting and dissemination of results will occur from April to September of 2009.

Personnel

Jude Southward, Project Director, Conservator/Museum Conservation Department Chair (21 days). A DMNS conservator since 1993, Southward will serve as project director. She has directed six IMLS conservation grants to improve environmental conditions for DMNS collections, and was instrumental in fundraising for the DMNS Emergency Preparedness Plan for Collections. In anticipation of this collections risk assessment, Southward attended a one-day workshop entitled *Assessing Risks to Your Collection* at the American Institute for Conservation, in Portland, Oregon in 2004. In 2006, she attended a two-week course entitled *Prevention Conservation: Reducing Risks to Collections*, in Ottawa, Canada sponsored by ICCROM-CCI. Southward has been instrumental in moving the Museum along a path that encompasses a preventive care approach that will be augmented by the risk assessment. She will be responsible for all aspects of project management, including interfacing with the project's consultants and all project staff to ensure the project's smooth implementation and on-time completion, and dissemination of results.

Heather Thorwald, Assistant Registrar (130 days). Thorwald joined the Museum in 2005. Her responsibilities in connection with the Museum's architectural evaluation familiarized her with the location of the many types of collections data needed for the risk assessment. Under Southward's supervision, Thorwald will coordinate all the project activities, including training, research, report preparation and distribution. Throughout the project period, she will work 50% FTE on the risk assessment.

Lisa Crunk, Library & Archives Assistant (26 days). Crunk joined the Museum in 2006. She holds a B.A. in Anthropology and is an M.A. candidate in Public History & Preservation at the University of Colorado, Denver. Crunk will attend the two-day workshop and then carry out baseline research of institutional information concerning collecting history, facility history, and public access to the collection.

Kelly Goulette, Registrar (19.5 days). As DMNS Registrar since 1997, Goulette manages the DMNS Collections Policy that guides how the Museum meets its fiduciary responsibility for the collections. In anticipation of a collections risk assessment, Goulette in 2004 attended a one-day workshop entitled *Assessing Risks to Your Collection* at the American Institute for Conservation, in Portland, Oregon. She will participate in the one-day orientation and attend both the two-day and the intensive three-day trainings. Her project responsibilities will

also include researching questions from other project staff regarding the historic and current applications of policies and procedures that impact the collections.

Bridget Sabo, Conservation Technician (6 days). Sabo joined the DMNS in 2006. She holds a B.A. in History, a Certificate in Museum Studies, and an M.S. in Anthropology. Sabo will attend the two-day training and assist with research on collections preservation throughout the project period.

Kathleen Tinworth, Evaluation Manager (7 days). Tinworth joined the Museum in 2007. She is an experienced evaluator who holds a B.A. in Psychology and Criminology and an M.S. in Investigative Psychology. Tinworth will attend relevant sections of the training sessions and ensure that the risk assessment is implemented systematically across the collections.

Laura Matthews, Collections Grant Administrator (10 days). Matthews, who holds a B.A. in Anthropology, joined the DMNS in 2001. She will track grant expenditures and matching funds, ensure compliance with grant restrictions, facilitate travel arrangements for consultants, and assist with reporting requirements.

Collections Managers (83 days). All five of the Museum's Collections Managers will participate in the project (see Budget Justification for their names and time commitments to the project). They will bring to the project an understanding of the management and behind-the-scenes access needs of the collections. Each will participate in both the two-day general training and the three-day intensive training. Collections managers will then participate in the collections risk assessment. The time allotted for risk assessment activities is commensurate with the number, size, and complexity of the collections for which they are responsible (see Attachment A).

Curators, Librarian, and Archivist (156 days). The Museum staff members responsible for curation of the collections include 12 curators, a librarian, and an archivist. These 14 staff members bring to the project critical information on the history, content, and significance attributes for the collections. They will each participate in the two-day general principles training and spend an additional four to six days (as determined by the size and complexity of the collections for which they are responsible) on the risk assessment. Please refer to page 1 of the Budget Justification for details on these staff members' names, titles, time on the project, and corresponding cost-share value.

Consultants (61 days). R. Robert Waller, Chief Conservator of Canadian Museum of Nature, is an internationally renowned expert in his field, with more than 30 peer-reviewed publications. Waller worked closely with Southward to develop the collections risk assessment proposal. He will provide 40 days consulting service over the 12-month project, including 30 on site. The on-site days will be divided over four (4) visits from November of 2008 to April of 2009 for project orientation, general principles and intensive trainings, and in-depth work with each team conducting collections risk assessment. Off-site time will be for preparation, review, and expert feedback. His team includes five associates and assistants who will contribute a total of 21 days to the project, including seven on site. Waller's resume and brief bios of each team member are attached.

Facilities and Building Operations Staff (14 days). Elaine Harkins, Facilities Director (6 days); Matthew Gargan, Security Captain (6 days); and James Calder, Building Services Manager (2 days) are long-term Museum employees with substantial knowledge and historical perspective of the facility's operations. All three will attend the two-day training. Harkins and Gargan will also research facility operations for the risk assessment.

Development and Finance Staff (4 days). Jill Viehweg, Grants Officer (2 days), and Adrian Gallagher, Controller (2 days) will attend the two-day training. Their role is to share knowledge of the risk assessment with their respective divisions, strengthening the institution's global perspective of collections stewardship.

Budget

The project budget was developed by the project director with input from the consultant. It has passed review by senior staff members from the Museum's Research and Collections, Development, and Finance Divisions, who believe it to be well conceived and adequate to complete the project. The cost share requirement is met entirely through contribution of Museum staff time and associated indirect costs. Because is an essential step in the Strategic Plan's Collections Initiative, all contributed staff time has been approved. IMLS funds are requested for salary and fringe benefits for two part-time staff members, consultants, travel, supplies and materials, and associated indirect costs. Please see the attached Budget Detail, Budget Summary, and Budget Justification.

4. Impact

Information on any products that will result from the project

The tangible product of the risk assessment will be a *DMNS Collections Risk Assessment Report*, to be authored jointly by the consultants and DMNS project staff. In the report, risk control strategies will be compared in order to easily identify patterns across all collections. The report will contain both institution-wide and collections-specific risk reduction recommendations. The project director and Collections Initiative Team will present key findings and distribute the report to all project staff, and to the Museum's President, Vice Presidents, and Board of Trustees (especially its Strategy and Planning Committee).

Project staff will bring their expertise to the process and will also gain further knowledge through their participation. An important benefit of the risk assessment is that it will provide a strong institutional mechanism by which information from curatorial, collections management, and preservation can be merged to advance strategic goals.

Measurable results and the process to evaluate and report on those results

The most compelling measurable results of this project will occur when the recommendations in the DMNS Collections Risk Assessment Report are incorporated in the new collections storage facility. Other measureable results will include the number of audiences reached with the report, and the number of abstracts about the project submitted for presentation to professional meetings.

DMNS's Evaluation Manager will help the Museum ensure consistency in project implementation and ensure that data across collections can be compared.

The DMNS will report to IMLS on project evaluation and project developments.

Long-term impact of the project after IMLS funding ends

The long-term impact will be the ability of the Museum to use the information contained in the risk assessment report to inform building specifications and construction for the new storage facility. The risk assessment will afford the Museum the opportunity to be thoughtful about how to reduce risks to collections in a way that balances both preservation and collections management goals in a facility that will maximize public access to collections. It will also further team building and staff development as the process will draw from broad-based collections, security, and building operations staff expertise. Further, the process will strengthen the institution's global perspective of collections management and stewardship standards. This will ensure that the collections under the care of the DMNS be preserved in perpetuity and utilized by the Museum's core external audiences, including the general public and the scientific community, while maximizing cost-efficiency.

BUDGET FORM - PAGE FOUR

Section B: Summary Budget

	$ IMLS	$ Cost Share	$ TOTAL COSTS
1. Salaries and Wages	21,613.00	70,351.00	91,964.00
2. Fringe Benefits	2,161.00	14,070.00	16,231.00
3. Consultant Fees	45,450.00		45,450.00
4. Travel	11,347.00		11,347.00
5. Supplies and Materials	1,103.00		1,103.00
6. Services			0.00
7. Student Support			0.00
8. Other Costs			0.00
TOTAL DIRECT COSTS (1—8)	81,674.00	84,421.00	166,095.00
9. Indirect Costs	22,297.00	23,047.00	45,344.00
TOTAL COSTS (Direct and Indirect)	103,971.00	107,468.00	211,439.00

Project Funding for the Entire Grant Period

1. Grant Funds Requested from IMLS	103,971.00
2. Cost Sharing:	
a. Cash Contribution	
b. In-Kind Contribution	107,468.00
c. Other Federal Agencies*	
d. TOTAL COST SHARING	107,468.00
3. TOTAL PROJECT FUNDING (1+2d)	211,439.00
% of Total Costs Requested from IMLS	49.17%

* If funding has been requested from another federal agency, indicate the agency's name:

	2008			2009								
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k assessment method												
blish collections context, identify risks, calculate magnitude of risk, and prioritize r the collections listed below:												
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matching funds for IMLS reporting												