

Daniels Objects Conservation Laboratory
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**MHC ENVIRONMENTAL MONITORING AND CONTROL
POLICY AND PROCEDURES**

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**Goals of the Minnesota History Center (MHC) Conservation
Environmental Monitoring Program:**

- To insure that the Heating Ventilation Air Conditioning (HVAC) System is running at the optimal levels for the long-term preservation of the collections, both in storage and on exhibit.
- To foster proper communication between the conservation, collections, and Institutional Services/Physical Plant departments in matters concerning the MHC museum environment in order to correct problems quickly and proficiently as they arise.
- To keep ongoing records of the environment within the MHC in order to document and diagnose problems with the HVAC system.

Definitions:

- **Environment:** This denotes the condition of the interior spaces in terms of the temperature, relative humidity and overall indoor air quality (IAQ).
- **HVAC:** Heating Ventilating and Air Conditioning System. This include the mechanical components, ductwork, controls and built-in recording devices.
- **Monitoring:** This denotes the on-going measuring, recording, analysis, and reporting of temperature and RH conditions in the galleries, storage areas, and lab spaces in the MHC.
- **Recording and reporting:** the data collected will consist of electronically and mechanically collected information. The electronic data will be available both in electronic and graphic media. The mechanically collected data will be available in hard copy in the form of hygrothermograph charts and hand recorded logs when hand-held thermohygrometers are used. The data will be reported in the form of graphs and written descriptions of "events" on a regular basis (weekly, monthly, semi-annually). Master files will be kept in the Conservation Department.

Equipment:

- **Electronic Dataloggers:** electronic recording devices that function as hygrothermographs. The data is downloaded into a PC and analyzed to produce graphs and statistics on the temperature and RH in a space over time. The dataloggers are factory calibrated, manufactured to stay in calibration for years, and are highly accurate. They will be considered to be the standard by which other measuring devices are judged, including the central HVAC computer. These loggers are annually recalibrated in the Daniels Objects Conservation Laboratory in a recalibration chamber.
- **Recording hygrothermographs:** clock-work driven recording devices which produce analog records on a circular chart. These devices have to be checked monthly and recalibrated mechanically when necessary.
- **Hand-held thermohygrometer:** electronic device that gives a digital readout of the temperature and RH. The data needs to be hand recorded on a log, then entered into a PC using a graphic software program if a graph is required. These devices need to be calibrated at least once a year using soluble salt solutions at standard RH levels.

Methods:

- A complete set of floor-plans for the MHC listing all HVAC-served spaces and the locations of the Air Handling Units (AHU) and the rooms that each one controls will be supplied to the Conservation Department.
- A list of the AHU's and the rooms that each one controls will be supplied to the Conservation Department.
- Key card access for all spaces where the environment is critical to the preservation of the collections will be provided to the Conservation Department.
- A standard format for recording and reporting data has been devised, as well as the list of report recipients.
- Data loggers are placed in the main exhibit galleries in order to give an immediate reading of the conditions in the gallery.
- Dataloggers are placed in storage and other security controlled areas and read weekly.
- Dial hygrometers and /or RH strips will be placed in cases as needed.
- Readings will be taken daily from dial hygrometers in vitrines for objects that require controlled environments.
- Daily outdoor readings will be taken to give a baseline for comparisons and interior spaces data analysis.

Problems with the HVAC System:

Communications:

- The Institutional Services Department will be contacted in all cases of problems with the HVAC system and problems with the museum environment. This goes for acute emergencies as well as when the optimal set

points are not met as reflected by the data. The Plant Management building engineers will be contacted.

- The Conservation Department will be contacted by Collections, Security, and other staff when problems are noted relating to the environment in the galleries and other areas. This will also be done for any problems with the monitoring equipment.
- Decisions will be made as to whether to remove objects from adverse environmental conditions that cannot be corrected in a timely manner to avoid damage.

Events:

- Events are defined as incidents where the HVAC system produces extreme spikes or troughs in the temperature and RH conditions over a relatively short period of time due to control and/or mechanical problems and failures. These events need to be recorded and reported since they can help to diagnose acute and chronic problems in the system. When breakdowns are noted by Physical Plant staff, they will be reported to the Conservation Department so they can be properly noted in the data graphs and recorded in the environmental monitoring data base.
- Responses to HVAC problems may include the following:
 - o Collections may have to be moved into a functioning AHU areas.
 - o Conservation staff may have to set up portable dehumidifier/humidifier units to maintain required conditions.
- Chronic malfunctions of AHU equipment:
 - o Collections may have to be moved.
 - o Exhibits may be to be moved.