

Roger —
For Park review
& comments.
Respond by ~ 12/2/91
Thanks
John Karish

Proposal For A Water Resource Management Plan:

Hopewell Furnace National Historic Site

September 19, 1991

Principal Investigators:

Dr. William E. Sharpe

William H. Neff

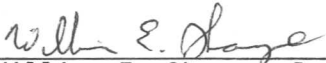
The Pennsylvania State University

Proposed Starting Date: January 1, 1992

Proposed Completion Date: September 30, 1993

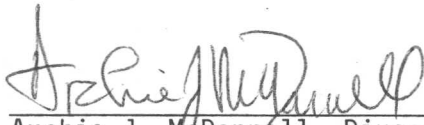
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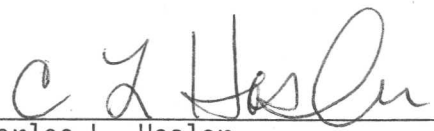


William E. Sharpe, Professor of Forest Hydrology
Principal Investigator

Approved by:



Archie J. McDonnell, Director
Environmental Resources Research Institute



Charles L. Hosler
Senior Vice President for Research and
Dean of the Graduate School

Abstract: Management objectives at Hopewell Furnace National Historic Site (HOFU) emphasize preservation of the Furnace's natural environment "in keeping with the historic themes of the site". Existing and potential threats to the quality of water resources at HOFU indicate that development of a management plan at this time will be particularly advantageous.

The plan will include surveys of water resources, related local socioeconomics, current water quality projects in the drainage, and applicable legal issues. A discussion concerning the implementation of a water quality monitoring program will also be incorporated.

An outline of procedural steps used in the assembly of a water resource management plan is provided in the proposal. These steps include information-gathering, sampling, testing, evaluation, and prioritization.

Statement of Need: As stated in the HOFU Natural Resource Management Plan, a primary objective of the NPS is "to manage the natural environment in keeping with the historic themes of the site". Since water played a crucial role in the original siting and development of the Hopewell Furnace, preservation of water quality and quantity in the HOFU vicinity is critical to maintaining the integrity of the site.

Present conditions in the HOFU area may already compromise the water quality and riparian health of French Creek and its tributaries. Possible contaminant sources include: landfills of unknown content, drainage from roadways, surface applications of treated sewage, and runoff from agricultural lands.

Forecasted growth and development in the French Creek watershed could create another set of potential pollution sources. Particular examples are the proposed Scott's Run housing development, and spillway construction at Hopewell Lake.

Documentation of present water quality values and streamflow characteristics will be of great value if a degradation of the water resources at HOFU becomes apparent. Established baseline values will provide the precedent needed to approximate the extent and intensity of contamination.

Objectives: The primary objectives of a water resource management plan (WRMP) are to document the condition of a water body or system in a coherent manner, and to recommend a program of action concerning the preservation and/or remediation of that resource. These objectives are achieved through the assimilation and analysis of information culled from a range of specialties.

An inventory of water resource attributes must encompass four domains: physical characteristics of the region, surface water resources, groundwater resources and to a lesser extent, aquatic biota. Particular attention will be focused on the quality of water in French Creek.

Local, state and federal interactions with HOFU may have a direct or indirect influence on resource management. Therefore, the illustration of such matters will be a significant component of the WRMP. These interactions will likely include issues of utilization, regulation, federal compliance and applicable water quality standards.

Current projects and activities within HOFU and French Creek State Park will play two roles in the development of a WRMP. Firstly, they will be examined closely to determine any consequences which may arise from their application in the watershed. Secondly, the projects may be good sources of certain water resource and water quality data.

After a detailed conceptualization of the water resources at HOFU has been achieved, an investigation of the need for further action will be conducted. A list of current and anticipated natural and cultural water resource problems will be produced and prioritized according to NPS management objectives. With this list, a series of possible actions will be derived and presented according to their urgency and potential effectiveness. The adoption of a water quality and quantity monitoring program will be discussed.

Procedures: Assembly of the WRMP is comprised of two phases, research and analysis. Both can then be divided into two sub-phases. For research, these are database access and field-testing. Analysis consists of evaluation and prioritization.

Database access is crucial to WRMP development, because of the vast amount of information that is available at minimal expense. This phase of research will hopefully yield nearly all the necessary data for WRMP assembly. Some relevant databases are STORET (EPA), PA-Dept. of Env. Resources database, NPS-Water Resources Division database, HOFU park records, WATSTORE (USGS), and PSU databases. In addition, benthic invertebrate data being collected by other investigators will be included in this analysis.

Data which is necessary for the WRMP but not contained in any available database will be determined through field sampling and analysis. Variables of this sort are expected to be minimal, and the investigators presently believe that two weeks of field work will be sufficient to measure these parameters. Laboratory analysis of the samples will be performed at the lowest cost available for the required level of precision. All field work and lab analysis will be entered into the HOFU park archives.

Evaluation and prioritization will occur simultaneously. Analysis of collected data will be performed with the assistance of calibrated mathematical models, if appropriate. During the evaluation phase, it is expected that certain issues will become particularly prominent. Those issues will then be considered in relation to the HOFU resource management objectives, and prioritized accordingly.

Collections: A draft WRMP will be developed during the first year of the project. Trial implementation of the draft WRMP will be conducted during the second year of the project with revision of the WRMP as required. Sampling during the development of the WRMP will probably be restricted to field samples of water at various locations to be determined within HOFU. A maximum of twenty-five samples, collected on at least two occasions, will be necessary. Parameters measured will include pH, SPC, NO₃, TP, Pb, Cd, Ni, turbidity, Cl, Na and selected organics (selection will depend on watershed inventory). Results from the laboratory analysis of the samples will be documented in the HOFU park archives.

Reports: Quarterly Progress Reports will be filed throughout WRMP development. A Draft Final Report will be submitted on or before August 1, 1993. The Final Report will be submitted by September 30, 1993. A Park Service article and Investigator's Annual Report will be submitted in the two weeks preceding submission of the Final Report.

Personnel: The principal investigators will be the primary personnel during WRMP development. Other individuals consulted during the assembly process will be credited in the Final Report for their contributions.

Principal Investigators: Dr. William E. Sharpe
Professor of Forest Hydrology
Pennsylvania State University
William H. Neff
Graduate Student, EPC Program
The Pennsylvania State University

Budget: Personnel, Travel Expenses, Equipment, Supplies, Materials, Service and Consultant Charges, Data Processing, Laboratory Analysis, Printing and Copying, Indirect Charges.

References: Statement for Management, Hopewell Furnace National Historic Site, Elizabeth E. Disrude, 5/20/87.

Hopewell Furnace NHS Natural Resource Management Plan, National Park Service, 7/88.

Proposal Requirements, Natural and Social Science Research, Mid-Atlantic Region, National Park Service, undated.

ENVIRONMENTAL RESOURCES RESEARCH INSTITUTE
THE PENNSYLVANIA STATE UNIVERSITY

ESTIMATED BUDGET
U S DEPARTMENT OF INTERIOR, NATIONAL PARK SERVICE
1/01/92 TO 9/30/93

COST CATEGORIES	PERCENT OF TIME	YEAR ONE	YEAR TWO	TOTAL FUNDS
SALARIES AND WAGES				
CATEGORY I				
SHARPE, W. E., PI	1.0%	\$648	\$506	\$1,154
CATEGORY II				
GRADUATE RESEARCH ASSISTANT (SPRING 92, FALL 92)	50.0%	8,303	0	8,303
CATEGORY III				
HOURLY STUDENT WAGES		2,700	3,000	5,700
SUBTOTAL, PERSONNEL		11,651	3,506	15,157
FRINGE BENEFITS (SEE BUDGET NOTES)				
30.6% OF CATEGORY I		198	155	353
11.5% OF CATEGORY II		955	0	955
8.1% OF CATEGORY III		219	243	462
SUBTOTAL, FRINGE BENEFITS		1,372	398	1,770
PERMANENT EQUIPMENT		0	0	0
TRAVEL		500	500	1,000
OTHER DIRECT COSTS				
FIELD AND LAB SUPPLIES		200	200	400
GRADUATE ASSISTANT TUITION REMISSION		3,843	0	3,843
WATER ANALYSES		0	5,000	5,000
SUBTOTAL, ALL OTHER DIRECT COSTS		4,043	5,200	9,243
TOTAL DIRECT COSTS		17,566	9,604	27,170
INDIRECT COSTS (SEE BUDGET NOTES)				
15.13% OF MTDC		2,076	1,453	3,529
TOTAL DIRECT AND INDIRECT COSTS		\$19,642	\$11,057	\$30,699
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BUDGET NOTES

- 1.SALARY COSTS ARE BASED ON SALARY RATES ESCALATED 5% BEGINNING JULY 1 OF EACH FISCAL YEAR. UNIVERSITY POLICY HAS BEEN TO AWARD SALARY INCREASES ON THE BASIS OF MERIT ONLY. THE ESTIMATED AVERAGE MERIT INCREASE IN SALARIES IS 5%.
- 2.FRINGE BENEFIT RATES ARE NEGOTIATED AND APPROVED BY THE OFFICE OF NAVAL RESEARCH, PENN STATE'S COGNIZANT FEDERAL AGENCY. PROPOSED RATES FOR JULY 1, 1991 AND FORWARD ARE 30.6% FOR CATEGORY I, 11.5% FOR CATEGORY II, AND 8.1% FOR CATEGORY III.

CATEGORY I - ALL SALARIES EXCEPT THOSE INCLUDED IN CATEGORIES II AND III.
CATEGORY II - GRADUATE ASSISTANTS.
CATEGORY III - WAGES AND FIXED TERM II.
- 3.ALL TRAVEL WILL BE IN ACCORDANCE WITH UNIVERSITY TRAVEL REGULATIONS.
- 4.TUITION IS CALCULATED USING THE RATES OF \$1,830/SEMESTER AND \$1,052/SUMMER TERM. AN ESCALATION FACTOR OF 10% IS APPLIED IN THE FALL SEMESTER OF EACH SUBSEQUENT YEAR.
- 5.INDIRECT COSTS RATES ARE NEGOTIATED AND APPROVED BY THE OFFICE OF NAVAL RESEARCH, PENN STATE'S COGNIZANT FEDERAL AGENCY. THE RATE FOR JULY 1, 1990 AND FORWARD IS 45.4% (ON CAMPUS) OF MTDC.
- 6.THE AMOUNT OF INDIRECT COSTS REQUESTED FROM THE U. S. DEPARTMENT OF THE INTERIOR FOR THIS PROJECT IS ONE-THIRD OF THE RATE INDICATED ABOVE OR 15.13%.