MICHIGAN TURFGRASS FOUNDATION
MTF

P.O. Box 80071, Lansing, MI 48908
Phone: 517 321-1660
Fax: 517-321-5822
mtfturf@comcast.net
www.michiganturfgrass.org

March 9, 2007 – Revised on May 2, 2007 per letter dated April 24, 2007; budget revised on May 9, 2007 to reflect state rates.

To: Shauna Tonsor
Michigan Biomass Energy Program
DLEG/Energy Office
611. W.Ottawa
P.O. Box 30221
Lansing, MI 48909

Re: Biomass Energy Grant RFP

V-A Michigan Turfgrass Foundation
P.O. Box 80071
Lansing, MI 48908-0071
Federal Identification Number: 23-7448202

V-B Thomas M. Smith
Executive Director
(517) 202-3019

V-C The Michigan Turfgrass Foundation (MTF) has extensive experience in managing grant dollars over its 50-year history. It has managed a grant from the Groundwater Protection Fund since 1998 to help support the MTF Michigan Turfgrass Environmental Stewardship Program (MTESP) that has ranged from $50,000 to over $100,000 each year. MTF Executive Director Tom Smith will be the project manager overseeing the overall project setup, goals and deliverables. Tom will also provide the financial oversight for the project. Mark Collins will provide the primary technical assistance in setting up the project and in running the experimental design. Mark is the farm manager at the MSU Hancock Turfgrass Research Center. Shanna Draheim will develop the outreach information and coordinate the workshops as part of the MTF MTESP to educate and promote this biomass project. The project will be evaluated by first quantifying the number of participants at the Golf Association of Michigan Super GAM Day and the MTF/MSU Turfgrass Field Day on June 11 and August 22, 2007, respectively that attend a field day stop for the project. In addition to these industry events, three workshops will be developed based on the results of the project and offered

through the MTESP. As part of these five outreach events, promotion and tracking of adoption of this technology will be conducted through the life of the grant and in subsequent years by MTESP staff. In addition to the outreach effort and evaluation, a technical evaluation of the project for feasibility as described in the Work Plan will be developed.

V-D Problem Statement: The turfgrass industry in Michigan generates $1.86 billion annually towards Michigan's economy and employs 30,000. Turfgrass covers 1.89 million acres in Michigan. Mowing is a routine management practice for all turfgrass areas. Grass clippings are typically returned to most turfgrass areas, but in certain situations, clippings are removed. Clipping removal is typical for highly manicured areas on golf courses and certain sports fields. Clippings that are removed either end up dispersed on other turf areas of lower maintenance or are added to an organic waste pile that may or may not be actively composted. Clippings dispersed on other turf areas, if not properly sited, may lead to surface water contamination or impact the quality of the turf where they are dispersed. Clippings added to a waste pile may also lead to off-site movement of nutrients, often create unpleasant odors, and may be unsightly if not properly screened. These clippings represent a viable biomass source for energy production on sites where they are generated.

There are approximately 865 golf courses in Michigan that account for 95,800 acres of the turf in Michigan. Of this total acreage, 34,500 acres is in high maintenance grasses where clippings are likely to be removed (greens, tees, and some fairways). Mowing of greens is typically daily, tees and fairways are often mowed every other day, and may be close to daily on some courses during the growing season. On one acre of green where 0.1 inch of clipping is removed, over 360 cu ft (13.33 cu yd) of clippings would be generated daily. Mowing of greens in a typical season would be for 120-150 days. At the lower figure, this represents 43,200 cu ft (1,600 cu yd) of clippings from each acre annually. At even half this amount, this represents 745,200,000 cu ft (27,600,000) of clippings generated from Michigan golf courses annually.

Golf courses are identified as the initial target group for this project because of their ready acceptance and early adoption of innovative practices through the MTESP, the ready outreach network in place through the MTESP and MTF, and the opportunity for golf courses to utilize a biomass source that they deal with daily as a waste product. Other turf segments are potential adopters of this technology in the future.

V-E Work Plan:

Initial Setup: Purchase pelletizer and pellet stove and install at the Fuller Building at the Hancock Turfgrass Research Center at MSU. Collect clippings from 1 acre of high maintenance turf, weigh clippings and determine wet volume and weight. Dry clippings and determine dry volume and weight. Test-pelletize clippings with 3-4 commercially available binding agents. Determine stability of pellets by testing crush strength and handling (experimental design to be determined after first test run). Conduct initial combustion runs with all viable pellet types. Initial setup to be complete by the June 11,

2007 Super GAM Day Field Day (100-150 golf course superintendents/greens committee members/general managers attending). ***Total staff time: 80 hours***

Biomass Production: Clippings will be collected and pelletized over the course of the season and stored in the Fuller Building and a new maintenance building to be constructed on site. Pellet batches will be labeled as to date of production to test for storage stability. A demonstration run of the palletizing and of the combustion will be a field day stop at the August 22, 2007 Turfgrass Field Day (600 turfgrass professionals from all segments of the industry attending). This project will also be promoted at an MTESP program workshop at Greywalls Golf Course in the Upper Peninsula on September 11, 2007 (15-20 golf course superintendents and staff). An article will be written in the summer issue of the MTF NewsNotes (1,200 mailed) and also posted on the MTF and MTESP web sites. At least 3 e-mail blasts will be sent out describing the project and its progress during this first season (700 on list serve). Pellet production will end in early to mid October as mowing plot areas is reduced. ***Total staff time: 260 hours***

Combustion Run: The stored pellets will be used during the fall and into the winter to heat the Fuller Building or the new maintenance building to document feasibility. During this time, the amount of pellets used per square footage of heated space will be tracked during the combustion runs. The ease of handling, pellet stability, and total biomass utilized will be calculated. Economic comparisons will be made for biomass heating and a traditional heat source. The total time invested in pelletizing will be calculated. As this information is determined, the appropriate literature and outreach information, including a PowerPoint presentation with video clips documenting the entire process will be developed. A presentation will be made at the Great Lakes Trade Expo January 7-9, 2008 as well as a display (7,000-8,000 Green Industry Professionals attending). A section for our current MTESP Energy and Waste Management Workshop will be developed and presented in early spring of 2008 (15-20 golf course superintendents and staff at each of three locations). ***Total staff time:280 hours***

Conclusion: A report will be written for DLEG and will include all outreach information, the PowerPoint, and a project summary with conclusions. The equipment will continue to be utilized at the Hancock Turfgrass Research Center and the outreach efforts and tracking will be continued after the project has formally ended in April 2008. ***Total staff time: 120 hours***

Month	Activity	Staff	Time (hrs)
May	set up pelletizer and pellet stove	Collins	30
	photograph process	Draheim	10
	administration and oversight	Smith	10
	Collect clippings and pelletize	Collins	30
June	Collect clippings and pelletize	Collins	30
	prepare MTF Field Day info	Draheim	20
	administration and oversight	Smith	10
July	Collect clippings and pelletize	Collins	30
	prepare MTF Field Day info	Draheim	10
	administration and oversight	Smith	10
August	Collect clippings and pelletize	Collins	30
	MTF Field Day presentation	Draheim	15
	administration and oversight	Smith	20
September	Collect clippings and pelletize	Collins	30
	MTESP Workshop	Draheim	20
	administration and oversight	Smith	15
October	Finish clipping collection	Collins	20
	Begin combustion runs	Collins & Draheim	60
	administration and oversight	Smith	20
November	Combustion runs	Collins	10
	outreach materials	Draheim	20
	administration and oversight	Smith	10
Dec	Combustion runs	Collins	10
	outreach materials for GLTE	Draheim	30
	administration and oversight	Smith	10
January	Combustion runs	Collins	10
	GLTE presentation	Draheim	20
	administration and oversight	Smith	20
February	Combustion runs	Collins	10
	Energy & Waste Workshop	Draheim	15
	administration and oversight	Smith	10
March	Combustion runs	Collins	10
	outreach info wrap-up	Draheim	15
	Begin Summary & Conclusions	Draheim & Smith	40
	administration and oversight	Smith	20
April	Project concludes - Final Package	Draheim & Smith	60
		Total Staff Time	**740**

Initial Setup
Biomass Pro
Combustion
Conclusions

Additional Student labor not shown above - 440 hours

V-F No prior experience in the energy field. Project manager has had experience in biomass production for fiber in automotive composites.

V-G Personnel already covered in Section V-C.

V-H May 1, 2007 – April 30, 2008

V-I Budget

Budget Item	**FY-06**		**MTF/MSU match***
A. Personnel Wages			
A1. Collins			5,200.00
A2. Draheim	11,475.00		
A3. Smith			12,375.00
B. Fringe Benefits			2,693.60
A4. Undergraduate students			6,600.00
C. Total Personnel Costs (A+B=C)	11,475.00		26,868.60
D. Nonexpendable equipment	8,500.00		6,000.00
E. Materials & Supplies			2,500.00
F. Travel	1,000.00		755.72
G. Total Direct Costs	**20,975.00**		
H. Indirect Costs @ 15%	3,146.25		
TOTAL	**24121.25**		**36,124.32**

Budget Notes:
A: Personnel
A.1 Collins – MSU employee – 260 total hours at $20.00/hr
A.2 Draheim – subcontractor to the MTF at $45.00/hr no fringes – 255 total hours
A.3 Smith – MTF subcontractor $55.00/hr no fringes – 225 total hours
A.4 Student labor: 440 hours @ $15.00 no fringes employed through MSU
B: Fringes for Collins only at MSU rates of 51.8%
D: Colorado Mill Equipment supplied through Freedom Equipment in Rockford, IL for $8,500. This is a new model of pellet mills designed for small production runs that will be available May, 2007; pellet stove and misc. equipment purchased by the MTF Founder's Society

E. For outreach information: Table-top display, binders, paper, dividers, cd's with covers for PowerPoint presentation, digital photo printing and mounting, general graphics.

F. Travel to conferences & workshops:

- Super GAM Day & MSU/MTF Field Day
  - 70 miles @ 32.8 cents/mile = $ 22.96
  - Registrations = $ 150.00
  - 2 lunches = $ 14.50
- MTESP workshop at Greywalls
  Marquette,MI, Sept 11, 2007
  - 810 miles @ 32.8 cents/mile = $ 265.68
  - 2 nights lodging @ $65.00/ = $ 130.00
  - 2 days meals @ $31.00/diem = $ 62.00
- GLTE Conference in Grand Rapids
  January 6-9, 2008
  - 160 miles @ 32.8 cents/mile = $ 52.48
  - 3 nights lodging @ $125.00/ = $ 375.00
  - 3 days meals @ $38.50/diem = $ 115.50
  - parking = $ 50.00
- 3 MTESP Waste & Energy Workshops
  SE, SW, & NW Michigan
  - 700 miles @ 32.8 cents/mile = $ 229.60
  - 3 nights lodging @ $65.00/ = $ 195.00
  - 3 days meals @ $31.00/diem = $ 93.00

Total $1,755.72

V-J Resumes attached for Smith & Draheim

Thomas M. Smith

Education: M.S., Turfgrass Management, 1985
Michigan State University, East Lansing, MI
B.S., Turfgrass Management 1979
Michigan State University, East Lansing, MI

Professional Experience:
EXECUTIVE DIRECTOR – Michigan Turfgrass Foundation - 2003 to present
PRESIDENT - Grass Roots, Inc., Okemos, MI -1982 to present
TURFGRASS EXTENSION AIDE, Michigan State University Cooperative Extension Service, 1978-1982.

Expertise:
Mr. Smith has expertise in a broad range of areas relating to turfgrass management, ornamentals and trees, native plants including wildflowers, grasses and general environmental issues. He specializes in integrated pest management programs for turf and ornamentals, native wildflower and plant community establishment, restoration, and environmentally sound landscape design. In addition to his business interests, Mr. Smith teaches at the university and community college level and lectures extensively to a variety of audiences on the topics of his expertise.

Teaching Experience: Adjunct Faculty, Michigan State University, 1999 to present - Developed Turf and Landscape Business Management class; Instructor, MSU Evening College; Instructor, Lansing Community College, 1988 and 1994 to 2002.

Publications:
Authored or Co-authored the following Michigan State University Cooperative Extension Service Bulletins:

- Site Preparation for Lawn Establishment
- Seeding a Lawn
- Sodding a Lawn
- Grasses for Lawns in Michigan
- Mowing a Lawn
- Watering a Lawn
- Lawn Renovation
- Moss, Algae, and Slime Molds
- Lawns in Shade

Affiliations/Community Service:
Wildflower Association of Michigan Board of Directors, 1989-1997
Michigan Turfgrass Foundation Board of Directors: President, 2001; Vice-President, 2000; Treasurer 1996-1999
Michigan Nursery and Landscape Association Research Committee
Ingham County Agricultural Advisory Committee
Green Thumb Project Advisory Member (To develop a no pesticide approach to lawn care for the Great Lakes Basin)

Nature Conservancy Partner - Prioritization of Landscapes for Conservation Purposes in Michigan

SHANNA W. DRAHEIM
1119 Southlawn, East Lansing, MI 48823
(517) 337-4847, shannadraheim@comcast.net

PROFESSIONAL EXPERIENCE

Independent Consultant/Volunteer; August 2006 – present

- Reviewed "Energy Efficiency and Renewable Energy Outreach" and "Renewable Energy Demonstration Center" grants for the State of Michigan Energy Office.
- Assisting in the development of a "Toward Wildlife Friendly Wind Power in the Great Lakes Basin" workshop at the State of the Lakes Ecosystem Conference in November, 2006, including coordination of the agenda, speakers, and announcements.
- Served as an instructor on *Great Lakes Contaminant Issues* at the Inland Seas Education Association Teacher Workshop, August, 2006.

Michigan Department of Environmental Quality (MDEQ); Lansing, MI
Environmental Quality Analyst, Water Bureau; Sep., 2004 to August, 2006

- Served as technical expert, community liaison, and program manager for several of Michigan's Great Lakes Areas of Concern, which are areas identified in the U.S.-Canada Great Lakes Water Quality Agreement (GLWQA) as highly polluted. Worked closely with public advisory groups to identify, seek funding, and implement projects for water quality protection, monitoring, and restoration.
- Identified the agency's need for consistent, statewide criteria for determining restoration of water quality in Areas of Concern, and led the resulting project to develop and write MDEQ's *Guidance for Delisting Michigan's Great Lakes Areas of Concern*. Coordinated input from government agencies and community stakeholders; worked with management to determine feasibility of implementing criteria; wrote and published the criteria; and presented the information to state and local partners in multiple public forums.
- Served as expert and designated staff resource on delisting Areas of Concern (i.e., removing an Area of Concern from the GLWQA list). Provided information and direction on implementing the state's *Guidance*,

including application of water quality restoration criteria, and the state, federal, and international processes for delisting Areas of Concern.

- Acted as representative, along with U.S. Environmental Protection Agency, Ontario Ministry of the Environment, and Environment Canada, on a bi-national workgroup to manage Areas of Concern that are shared jurisdiction between Michigan and Canada. Provided MDEQ input on restoration programs for bi-national Areas of Concern, and developed bi-national delisting policies for approval by managers of the four agencies.

U.S. Environmental Protection Agency, Region 9; San Francisco, CA

Environmental Protection Specialist 13; January, 2001-August, 2004

- Reviewed Environmental Impact Statements (EISs) prepared by federal agencies under the National Environmental Policy Act (NEPA) to assess ecological effects of prospective actions.
- Wrote public comments evaluating EIS analyses, identifying areas of environmental concern, and worked with agencies to develop measures to reduce the negative environmental impacts of federal projects.
- Briefed senior management, including Regional Administrator, on key federal projects, and produced monthly "hot report" on upcoming high-visibility EISs.
- Served on Region 9 energy and environment issues workgroup, which coordinated the agency's recommendations on energy projects and needs in California.

U.S. Environmental Protection Agency; Washington, DC

Environmental Protection Specialist GS-13 and Team Leader, Office of Wetlands, Oceans and Watersheds; November 1998 to December 2000

- Evaluated and provided input to senior management on the consistency of federal water-related legislation with Clinton Administration environmental goals.
- Team Leader for the state and tribal wetland team. Identified program priorities, developed annual plans and budget, and managed workload of three staff.
- Provided policy and technical support to states, tribes, and local governments in developing wetland plans. Managed related $15 million grant program.

National Science Foundation (NSF); Arlington, VA

Program Manager GS-12, Division of Earth Sciences; July 1997 to October 1998

- Coordinator of $15 million cross-disciplinary research grant programs for watershed science and geochemistry/biogeochemistry. Developed research announcements and managed peer review process for more than 1,000 proposals annually.
- Prepared analyses, funding summaries, and other program information for NSF management and the research community. Represented NSF at conferences and program meetings to promote multi-disciplinary research programs

Presidential Management Intern (GS-9/11); July 1995 to July 1997

- Participated in two-year fellowship designed to provide broad management and technical experience through placement in rotational assignments within NSF (8 months) and with federal agencies outside NSF (16 months – see below).
- **National Oceanic and Atmospheric Administration (NOAA)**. Conducted an evaluation of the California Coastal Zone Management program that included meeting with hundreds of stakeholders to assess the effectiveness of the program. Worked with the governments of Jordan and Israel to develop a USAID project for conservation and restoration of coral reefs in the Gulf of Aqaba, and organized a joint workshop of international scientists in Aqaba, Jordan (for 1 year)
- **Smithsonian Environmental Research Center.** Taught outdoor environmental education programs on the Chesapeake Bay ecosystem (4 months).

TRAINING AND PROFESSIONAL DEVELOPMENT

- Negotiating Effective Environmental Agreements; Concur Inc.
- Evaluating Cumulative Environmental Impacts; U.S. EPA Region 9
- Working Effectively with the Media; U.S. EPA Region 9
- Watershed Partnership Seminar; U.S. Office of Personnel Management

PROFESSIONAL HONORS AND APPOINTMENTS:

- City of East Lansing Commission on the Environment – 2004 to present
- Outstanding Annual Performance Award (NSF and EPA) – 1995 through 2004
- U.S. EPA Regional Administrator's Award for Creative Risk Taken - 2002
- U.S. EPA Bronze Medal Award for Commendable Service - 2000

- Special Performance Award - National Oceanic & Atmospheric Administration – 1997

PRESENTATIONS AND PUBLICATIONS

- Presenter – *Practical Application of Restoration Criteria for Michigan's Areas of Concern*; International Association for Great Lakes Research (IAGLR) 49th Annual Conference, May 2006
- Presenter - *Development of Restoration Criteria for Michigan's Areas of Concern*; IAGLR 48th Annual Conference, May 2005
- Eberhardt, Roger and Shanna Draheim. *Michigan Areas of Concern Restoration Criteria: Development and Public Involvement.* Journal of Great Lakes Research. International Association for Great Lakes Research [in press].
- Presenter - *Evaluating Environmental Impacts of Community Development Projects*; U.S. Department of Housing and Urban Development
- Presenter - *NEPA Practices Workshop*; National Association of Environmental Professionals
- Presenter - *Environmental Impacts of Water Projects*; Army Corps of Engineers

EDUCATION:

Master of Public Affairs - Natural Resources Planning, May 1995
Indiana University, School of Public and Environmental Affairs; Bloomington, IN

Bachelor of Arts - International Relations, June 1991
Michigan State University, James Madison College of Public Policy; East Lansing, MI