

2013 Environmental Benefits Report

Minnesota Technical Assistance Program

Submitted to the Minnesota Pollution Control Agency

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About MnTAP

The Minnesota Technical Assistance Program (MnTAP) is an outreach and assistance program at the University of Minnesota. MnTAP helps Minnesota businesses develop and implement industry-tailored solutions that prevent pollution at the source, maximize efficient use of resources -- including water and energy -- reduce costs, and improve public health and the environment.

Discovering a need for waste reduction and pollution prevention assistance, the Minnesota legislature amended the Waste Management Act in 1984 to "provide for the establishment of technical and research assistance for generators of hazardous and industrial waste in the state." The Minnesota Toxic Pollution Prevention Act, enacted by the legislature in 1990, directed the then Minnesota Office of Waste Management to "establish a pollution prevention assistance program" for all persons in the state using, generating, or releasing toxic pollutants, hazardous substances or hazardous wastes. Today, the Minnesota Pollution Control Agency provides that assistance primarily by providing funding to the University of Minnesota, School of Public Health, Environmental Health Sciences Division for MnTAP.

Pollution prevention and energy efficiency technical assistance is tailored to individual businesses through a number of services including site visits, student interns, materials exchange, facilitated teams, workshops and industry specific resources. Since MnTAP's inception in late 1984, staff members have conducted over 3,500 site visits to small and large manufacturing and service businesses in all parts of the state. The services that MnTAP provides help businesses preserve Minnesota's natural environment through pollution prevention measures.

MnTAP Staff Members

Laura Babcock, PhD Director

Anna Arkin Solid Waste Specialist

Karl DeWahl, CEM Program Coordinator

Matt Domski Organic Waste Specialist

Monique Dubos Communications Associate Mick Jost Program Coordinator

Bob Lundquist Senior Engineer

Linda Maleitzke Communications Specialist; Intern Program Administrator

Paul Pagel, CEM Senior Engineer; Intern Program Technical Coordinator Jane Pamperin Senior Engineer

John Polanski, M.Ed. Food Processing Specialist

Mark Powers Engineering Coordinator

A.J. Van den Berghe Engineer

The University's mission, carried out on multiple campuses and throughout the state, is threefold: research and discovery, teaching and learning, and outreach and public service. The University of Minnesota shall provide equal access to and opportunity in its programs, facilities, and employment without regard to race, color, creed, religion, national origin, gender, age, marital status, disability, public assistance status, veteran status, sexual orientation, gender identity, or gender expression.

Celebrating a Successful Year

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Director's Welcome

2013 was another great year for efficiency and conservation efforts across Minnesota. The work of MnTAP's dedicated staff members has resulted in significant source reduction of hazardous pollutants and improved raw material, water utilization and energy efficiency at businesses across the state.

Through continued support by the Minnesota Pollution Control Agency (MPCA), we have launched an outreach effort to promote reduction of volatile organic compounds, which contribute significantly to our state's air pollution. We have focused on industrial water conservation with support from Metropolitan Council Environmental Services and funding from the Clean Water, Land and Legacy Amendment to the state Constitution. MnTAP has launched two energy conservation studies sponsored through Conservation Applied Research and Development grants by the Minnesota Department of Commerce, Division of Energy Resources (DER) and concluded a significant energy conservation outreach effort supported through the US Department of Energy and administered through DER. We appreciate the continued support from all of our partner organizations and utilities, which helps MnTAP staff provide assistance to businesses in Minnesota, keeping them financially strong and reducing their environmental impact.

The implemented waste, energy and water conservation resulting from MnTAP efforts has resulted in an impressive set of environmental outcomes for the calendar year 2013. We have provided assistance to 200 companies across the entire state, with 42 companies realizing reductions totaling over 1 million pounds of waste, 6.2 million kWh and over 400,000 thousand therms of energy and conserving 50 million gallons of water. Combined, these reductions add up to a first year savings of \$1.2 million annually. Throughout this report, you will read success stories from some of the companies we assisted in 2013. The cost savings these companies have achieved are helping many of them increase production, add employees, and invest back in their businesses. This is good business for Minnesota.

Laura Babcock Director, Minnesota Technical Assistance Program

Links to MPCA's Strategic Plan

Water

Goal - Pollution from all sources is reduced or prevented

MnTAP provides technical assistance to POTWs and industrial water users through on-site assessments.

Air

Goal - Ensure emissions do not create unacceptable exposures MnTAP provides information and assistance for businesses to reduce VOCs and HAPs.

Goal - Reduce contribution to greenhouse gas emissions MnTAP provides industrial energy efficiency solutions to businesses through on-site assessments and outreach.

Land/Waste

Goal - Solid waste is managed to conserve resources and energy MnTAP has active outreach and assistance efforts to reduce waste through source reduction and reuse.

People and Approaches

Goal - Conserve resources and prevent pollution to protect the environment and economy

MnTAP is an outreach and assistance program that helps Minnesota businesses develop and implement industry-tailored solutions that prevent pollution at the source, maximize efficient use of resources, and reduce energy use and cost to improve pubic health and the environment.

Executive Summary

Project Overview

MnTAP has helped businesses identify and implement pollution prevention, water conservation and energy efficiency solutions through a number of projects and assistance methods throughout 2013. This work is driven by MnTAP's mission to help Minnesota businesses maximize resource efficiency, increase energy efficiency, prevent pollution and save money.

Highlights of MnTAP achievements during 2013 include:

- Conducting over 700 assistance activities
 - 200 individual Minnesota companies
 - 100 site visits and team meetings
 - 11 MnTAP intern projects
 - for recommendations, see "2013 Proposed Conservation Opportunities" table at right
- Expanding the Minnesota Materials Exchange
 - 291 new organizational members
 - 257 listings
- Concluding the U.S. Department of Energy industrial energy efficiency project - total implemented project savings of 100,000 MMBtu (annual energy equivalent of 150 windmills)
 - \$1 million energy cost savings
- Launching new initiatives
 - 3 new and 5 continuing special grant-funded projects
 - Outreach for area source volatile organic compounds (VOC) reductions
 - Partnership development for the federal

Economy, Energy and Environment (E3) initiative Energy savings realized by businesses resulted in substantial air pollution emissions avoidance

- 15.120.960 lbs CO2
- 52,530 lbs criteria pollutants
- 29 lbs household air pollutants

2013 Outputs

Technical Assistance Activity	2012 Results	2013 Results
Contacts (calls/emails)	493	545
Total Staff Site Visits (facilities)	196 (82)	105 (52)
Student Interns	9	11
Teams	8	8
Materials Exchange (# of exchanges)	70	111
Events and Presentations	35	50
MnTAP Website Visits	14,605 visits from 11,198 unique visitors	56,363 visits from 44,293 unique visitors

2013 Proposed Conservation Opportunities*

Recommendation Area	Proposed Reduction
Water Use - gal/yr	130 million
Energy - kWh/yr	30 million
Energy - therms/yr	832,000
Non-Hazardous Materials - Ibs/yr	3.9 million
Solid Waste - Ibs/yr	310,000

*Recommendations from 700 2013 assistance activities

2013 Implemented Outcomes

	Waste (lbs)	Ene	ergy	Water	Cost Savings
Activity	Non-Hazardous/Solid Waste (Ibs)	Electric (kWh)	Gas (Therms)	(gallons)	
Goal	3 million	5 million	300,000	10 million	
Site Visits	10,000	3,490,00	196,000	15,800,000	\$491,000
Teams	116,000	1,330,000	35,000	9,400,000	\$227,000
Interns	775,000	1,420,000	182,000	24,800,000	\$512,000
Materials Exchange	142,000				\$6,000
TOTALS	1.04 million	6.24 million	413,000	50 million	\$1.24 million

MnTAP Activities

Overview

The Minnesota Technical Assistance Program provides pollution prevention information and assistance to help businesses maximize resource efficiency, prevent pollution, reduce energy use, reduce costs, maintain a safe and healthy work environment for employees, and comply with environmental regulations. Pollution prevention technical assistance is tailored to individual businesses through a number of services, including site visits, student interns, materials exchange, facilitated teams, workshops and industry-specific resources.

Support

MnTAP is a business outreach program located at the University of Minnesota, School of Public Health, Division of Environmental Health Sciences. MnTAP works under a primary grant from the Minnesota Pollution Control Agency (MPCA) to partially fulfill the environmental technical assistance requirements of the Minnesota Waste Management Act and the Minnesota Toxic Pollution Prevention Act. During fiscal year 2013, MnTAP has leveraged direct MPCA funds to win additional competitive grant funding totaling 35% of the FY 2013 budget.

Overall Results

Through over 700 interactions with businesses across the state, MnTAP staff have been able to assist 200 organizations during the calendar year 2013. This includes over 100 on-site assistance visits to 52 companies as part of a technical assistance assessment, intern project, or team. Forty-two companies have reported making changes to their processes to reduce their environmental footprint and save money. Companies implementing recommendations made by MnTAP are realizing over \$1.2 million in first year savings.

2013 MnTAP Staff



Activities

- Conducting on-site assistance to help businesses implement pollution prevention practices and improved management of waste and pollution.
- Coordinating the Minnesota Materials Exchange Program
- Communicating and promoting solutions that help businesses reduce waste, prevent pollution, reduce energy use and save money.



Cost Savings Achieved by Interaction Type

Recommendations Cost Savings Distribution



Back row, left to right: Frank Strahan, Bob Lundquist, Paul Pagel, Matt Domski, Mark Powers, Mick Jost and Karl DeWahl Front row, left to right: A.J. Van den Berghe, Linda Maleitzke, John Polanski, Anna Arkin, Laura Babcock. Not pictured: Jane Pamperin, Monique Dubos

On-Site Assistance: Site Visits & Internal Team Development

2013 Outputs

105 site visits 52 different facilities 8 active teams

2013 Outcomes

See Executive Summary (page 1)

What they said...

"MnTAP staff met with our team regularly to help us meet our water conservation goals."

-- Dave Turner, Plant Manager, Archer Daniels Midland Company

2013 Goal

Conduct 200 site visits (5,000 site visit hours) to 100 different facilities to identify opportunities for companies to prevent waste and pollution and conserve resources including water and energy. Support Minnesota businesses by responding to questions on waste generation and resource utilization. Facilitate six internal company teams to provide pollution prevention and energy efficiency assistance.

2013 Site Visit Accomplishments (includes all special project results)

During site visits, MnTAP staff members analyze the current production situation, research possible alternatives to achieve reduction and deliver a report with specific recommendations to the organization for material, water or energy utilization improvement. MnTAP staff made over \$3.6 million in resource conservation recommendations to Minnesota businesses in 2013 for all on-site services. Forty-two companies reported implementation of recommendations to MnTAP in calendar year 2013.

2013 Team Development Commitment

After determining that team development and/or facilitation is the appropriate service to be provided, MnTAP makes the following commitment:

- Provide team training to new teams, laying out expectations for the process
- Attend team meetings regularly
- Provide pollution prevention, energy efficiency and/or water conservation ideas and success stories to the team
- Facilitate discussions and brainstorming sessions
- Provide advice and technical knowledge to the team
- Work with the team for up to 12 months to help achieve goals set by the team
- Work with the team members to provide cost savings and environmental impact calculations as needed
- Provide a final report of activities and progress to team and site management



Team Success: Water Conservation Team Reduces Usage and Cost

During 2013, a water conservation team at Archer Daniels Midland in Red Wing implemented significant changes that led to more efficient use of water and cost savings. The team began in August 2012 with the guidance of now-retired MnTAP staff member John Polanski.

Through the use of a new holding tank, piping changes, and optimized water softener regeneration cycles, ADM-Red Wing was able to reuse water that was previously disposed to the sanitary sewer system. According to their baseline consumption data, ADM is now using 500,000 fewer gallons of well water per month, which equates to a savings value of about 56%. The team has found other ways to reduce water as well as salt usage and continues to look for improvements going forward.

On-Site Assistance: Intern Program

2013 Outputs

11 intern projects

What they said...

"I was pleased with the student, project, outcome - everything! It will be beneficial to the company when we resolve the remaining questions and implement."

-- John Juleen, Maintenance Supervisor, St. Croix Forge

2013 Goals

This year, MnTAP had direct funding to place seven students with businesses to identify and implement resource and work efficiency solutions. MnTAP also sought partnerships to fund an additional four students in the program.

2013 Accomplishments

By leveraging funding from several grant and utility partnerships, MnTAP was able to place a total of 11 interns - nine for summer and one each for spring and fall semesters.

2013 Outcomes - Intern Program Implementation*

	Waste (lbs)			Energy			
Project Year(s)	Air Emissions (lbs)	Hazardous Waste (lbs)	Non-Haz/ Solid Waste (lbs)	(kWh)	(therms)	Water (gallons)	Savings
2011	4,200		10,500	3.8 million	1.2 million	6.2 million	\$1.1 million
2012	50	14,400	33,000	3.8 million	153,000	11.6 million	\$590,000
2013			775,000	1.4 million	182,000	24.8 million	\$512,000

*Implementation reported in 2013 for intern projects from all years

Funding Partners

- Minnesota Pollution Control Agency
- Minnesota Department of Commerce, Division of Energy Resources
- Clean Water, Land & Legacy Amendment, through Metropolitan Council
- Xcel Energy
- Minnesota Energy Resources
- CenterPoint Energy
- Minnesota Power



Intern Success: Energy Solutions Meter Out Savings

Each year, MnTAP interns work hard to find resource efficiency and cost-saving solutions for Minnesota businesses and this year was no exception. Here are some highlights of internproposed changes:

- Converting from a two-ditch to single-ditch operation at a wastewater treatment facility will save 1,860 kWh per day and \$39,230 per year.
- Insulating the magnesium pour ladles at an aerospace sand casting company could save 170,040 kWh and \$13,600 a year.
- Optimization process cooling pumps at a horseshoe manufacturing facility is estimated to save 242,400 kWh and \$20,580 per year.

See more solutions at mntap.umn.edu/intern/pdf/2013/Solutions.pdf

Minnesota Materials Exchange

2013 Outputs

291 new organizations/ companies 836 new individual members 17,446 unique visitors 32,257 website visits 257 listings 111 successful exchanges

2013 Outcomes

savings

142,331 lbs diverted material \$5,940 reported cost

What they said...

"We always turn to the exchange first so that our unneeded goods can be reused."

-- Eric Lillyblad, Environmental Specialist, Graco

2013 Accomplishments

The Minnesota Materials Exchange is a free website that links organizations that have reusable goods they no longer need to those who can use them. Throughout 2013, MnTAP worked to improve the functionality of the website to make its use as intuitive as possible. MnTAP also strategized and implemented changes to improve reporting of exchanges, in order to more fully quantify the benefits of the program



Partnerships

MnTAP continued its partnership with the University of Minnesota ReUse Program, which operates a sub-exchange within the Minnesota Materials Exchange. This sub-exchange, called the "Virtual Warehouse," allows University staff and faculty to exchange items with one another directly instead of through the ReUse Program, increasing efficiencies. MnTAP also began exploring a new partnership with a statewide trade organization to launch a sub-exchange for its members. This sub-exchange model allows our partners to offer a private exchange at a reduced cost, target a specific audience, and increase reuse within a specific community. Partners have the option to open these exchanges to the public, which can increase reuse activity.



Online Material and Waste Exchanges: A Case Analysis

MnTAP assisted Suvrat Dhanorkar, PhD candidate studying supply chain & operations in the Carlson School of Management at the University of Minnesota, with doctoral research that included an analysis of past Minnesota Materials Exchange data. Dhanorkar investigated the factors that influence exchanges, specifically the factors that affect seller commitment and buyer uncertainty. An analysis of 4,330 product listings and over 60,000 buyer-seller interactions yielded six main findings. The following factors increase the likelihood of successful exchanges:

- · Adding more detail to product descriptions, including photographs of the items
- Larger organizations listing items and shorter geographical distances between sellers and buyers
- Limited seller access to landfills and incinerators
- Higher regional (county) recycling rates
- Previous interaction between buyers and sellers
- Previous experience in opposite roles, i.e. buyers having previously been sellers and vice versa

Client Communications

2013 Outputs

545 calls/emails 2 market surveys 4 e-newsletters to approx. 830 subscribers 2 printed Source newsletters to approx. 2800 subscribers

1 intern-focused magazine

50 presentations

2 promotional banners

2013 Goal

Develop and disseminate technical information for Minnesota businesses to help them implement pollution prevention and energy efficiency practices and technologies. Promote MnTAP services and results through publications and presentations.

2013 Accomplishments

In 2013, MnTAP utilized a number of enchanced outreach tools and techniques to promote available project opportunities, gather information, and share the results of our efforts. Communication methods included electronic newsletters, targeted email campaigns, and target-specific printed materials.

Enhanced Promotional Materials

MnTAP developed several new promotional tools in 2013 to market our services, including:

- One full-color magazine highlighting MnTAP's intern program, also available online
- One sector-specific Source newsletter on energy projects, which was sent to ~4,000
 subscribers
- Two 84-inch tall promotional banners highlighting MnTAP services, for use at trade shows and job fairs

Outreach

MnTAP continued to market its services through multiple avenues, including:

- Public presentations, assessments and training workshops across the state
- Presentations at regional business and community outreach events
- Participation in multi-stakeholder planning activities
- Publication of "Cut the Wrap: How to Reduce Hospital Waste and Emissions," detailing project results in nationally-recognized business journal GreenBiz.com
- Co-hosting the By-Product Utilization Conference in Duluth with partner Natural Resource Research Institute
- · Presenting MnTAP results as part of an EPA Region 5 practitioners training event



Project Success: Launch of Magazine Highlighting Intern Program

The MnTAP intern program is a service that has been offered to Minnesota businesses for 28 years, accounting for about 20% of MnTAP's effort annually. In 2013, MnTAP added *Solutions* magazine to its promotional tool kit. This publication is an outreach tool for use by students and sponsors to promote results and leverage future participation in the program. Intended to become an annual publication, *Solutions* highlights our hard-working interns and the companies that support their recommendations to reduce waste, water, energy and spending.

Solutions has been very well-received, drawing praise from communications professionals and agency officials alike. Solutions will be used to promote the intern program at trade shows and job fairs and as a training tool to help future interns develop their case reports.

Read or download Solutions at: mntap.umn.edu/intern/pdf/2013/Solutions.pdf

MnTAP's 2013 Special Projects

Project & Funding	Highlighted Activities	Page
Implementing an Industrial E2 Program U.S. Department of Energy	Large-scale assessments in refrigeration energy efficiency. Over the entire project, over one million MMBtu of annual energy efficiency opportunity was identified, worth more than \$8 million.	8
Energy Efficiency of Wastewater Treatment Facilities	Provided energy efficiency benchmarking and assistance to wastewater treatment plants and shared information through training and demonstration projects.	9
U.S. Environmental Protection Agency Region V		
Assisting Minnesota Communities with Solid Waste Reduction U.S. Department of Agriculture Rural Development	Five trainings and 10 assessments were conducted across northern Minnesota in 2013. A video demonstrating how to do a waste assessment was produced in both English and Spanish. The project timeframe was extended and now concludes in September 2014.	10
Motivating Manufacturing Energy Efficiency with Lean	Student interns provided support for implementation of lean tools and energy improvements at two companies.	11
Minnesota Department of Commerce		
Water Conservation by Industrial Users Metropolitan Council with funding from the Clean Water, Land, and Legacy Amendment	Comprehensive survey report was compiled and submitted indicating current practices, opportunities, and barriers. Two additional water conservation assessments were conducted by MnTAP staff for a project total of seven, and three water conservation intern projects were completed.	12
Area Source VOC Reduction Minnesota Pollution Control Agency Clean Air Minnesota	Support voluntary reduction of VOC emissions at small- to mid-size businesses through education and outreach.	13
Developing a Reuse Network for Minnesota	Support the development of a state-based reuse network in Minnesota.	14
MPCA Environmental Assistance grant		14
Waste Management in Ramsey & Washington Counties Ramsey/Washington County Resource Recovery	Waste management assistance was provided to three businesses and two outdoor events in Ramsey and Washington Counties. Waste sorts, assessments, and discussions with various staff members helped identify opportunities and propose recommendations for waste management	15
Project	improvement.	



New Project: Conservation Potential at MN Data Centers

The Minnesota Department of Commerce, Division of Energy Resources sponsored this Conservation Applied Research & Development (CARD) program at MnTAP to define the energy efficiency opportunity at Minnesota data centers. Work comprised identifying best practices and summarizing the opportunity potential in a report.

One key finding is that, most often, site energy consumption data is not measured, so it may be a challenge to identify opportunities and quantify improvement.

Implementing an Industrial E2 Program

Project Outputs

200 operators trained 100 businesses impacted 34 sites assessed 6 intern projects held 5 training events offered 3 in-house teams launched

Project Outcomes

100,000 MMBtu reduced 256,000 lbs chemicals reduced

22 million gallons of water reduced

\$1 million yearly savings

What they said...

"Administering this federal program has provided Minnesota businesses an important opportunity to reap the benefits of significant energy savings."

-- Bill Grant, Deputy Commissioner, Minnesota Department of Commerce, Division of Energy

Sponsor

Minnesota Department of Commerce, Division of Energy

U.S. Department of Energy

Project Overview

Since 2010, MnTAP has been working under a U.S. Department of Energy Save Energy Now grant to help the state meet its energy savings goal of 1.5% of gross annual retail energy sales, as outlined in Minnesota's Next Generation Energy Act of 2007. The combined activities supported by the grant have assisted Minnesota manufacturing sites in identifying and implementing economically feasible energy efficiency projects that can save over one million MMBtu annually in electric and thermal energy efficiency savings compared to current practice.

Energy conservation efforts have focused on manufacturing sectors that contribute significantly to the state economy and are some of the largest energy users within Minnesota. Energy consuming systems studied in this work include:

- Compressed Air - Refrigeration - Steam - Fan

- Motor

Project Activities and Results

To date, 10% of the identified energy savings have been reported by our clients as being implemented in their operations, resulting in more than 100,000 MMBtu in reduced energy usage and an estimated \$1 million in cost savings. These savings were gained through changes in compressed air, steam and fan system designs, and motor upgrades.

It was observed that the implementation timeline for many projects is two or more years, even for projects with favorable payback periods.

- As part of the DOE program, MnTAP organized five operator training events, training 200 operators in energy-efficient operation of compressed air, steam, fan and motor systems
- A total of 34 energy efficiency assessments were conducted through contracts with DOEqualified specialists and the regional DOE Industrial Assessment Center, as well as industryrecognized specialists
- To assist companies beyond the assessment, MnTAP provided six companies with interns and participated in internal teams at three facilities, providing insight from past successes and connecting businesses to resources to support their energy reduction goals. This additional assistance aided implementation.



Project Success: Refrigeration Assessments

In 2013, MnTAP leveraged federal, utility and company resources in a partnership model to conduct energy resource quality assessments on large-scale refrigeration systems. To identify significant energy conservation opportunities, three refrigeration optimization assessments were conducted by Leo A Daly, Inc. and one tune-up assessment was conducted by Cascade Energy. Significant energy savings opportunities were identified at all facilities:

- Assessments identified 20 million kWh/year electric savings and 240,000 therm/ year gas savings
- Project payback for most recommendations was less than 3 years
- Opportunities included line sizing, UFD instrumentation and energy reclamation

Energy Efficiency of Wastewater Treatment Plants

2013 Outputs

11 calls and emails 2 site visits/assessments 1 intern project 4 assessment presentations to plants and regulators

> 5 technology demonstrations

2013 Outcomes

864,000 kWh \$66,000

What they said...

"The wealth of information and economic benefits to the City of Hutchinson from this program will be realized for many years to come."

-- Brian Mehr Wastewater Superintendent, City of Hutchinson

Sponsor

U.S. EPA Region V

Project Overview

Since the project began in May 2011, MnTAP has been providing energy efficiency assistance to Minnesota's wastewater treatment plants. This assistance has included onsite energy assessments to help wastewater treatment plant operators understand, identify, and implement energy efficiency opportunities in their facilities. Additional assistance has included training on wastewater plant energy efficiency, demonstration projects, and support of interns at wastewater treatment facilities.

2013 Project Activities and Results

Here are a few highlights of project activities:

- Two onsite assessments were conducted in 2013, for a project total of 10.
- One additonal intern project was completed, for a total of two.
- Energy reductions totaling 2,900,000 kWh per year, that would save \$217,000 annually, were identified, for a total identified project potential of 5,560,000 kWh and \$444,000.
- Five demonstrations of technologies important to energy conservation at treatment plants were conducted, including:
 - Turbo blowers, estimating the importance of blower upgrades
 - DO control using dissolved oxygen measurements allows set point control
 - Use of the aeration energy model as a tool for estimating cost savings

Future Plans

Based on past experience and the significant energy efficiency opportunities in wastewater treatment plants, MnTAP will continue to promote energy efficiency in this sector.



Project Success: Wastewater Treatment Energy Reduction

In 2013, MnTAP continued its successful outreach to water treatment plants through our intern program. The City of Hutchinson Wastewater department intern project attempted to reduce aeration energy consumption while also achieving greater removal of nitrates and nitrites (denitrification) without capital investment by changing the plant operation.

During a plant trial, all flow was diverted to one of two oxidation ditches operating in parallel. This trial resulted in a 43% reduction in ditch aeration energy consumption. The plant continues to run the single ditch, with electricity consumption reduced by 1,860 kWh per day, saving about \$39,000 per year.

The second goal of denitrification was not fully achieved; however, biological health of the ditch for organic removal appears to have improved.

Assisting Minnesota Communities with Solid Waste Reduction

Project Outputs

7 solid waste trainings

10 solid waste site assessments and reports

1 waste assessment video produced in English & Spanish

What they said...

"This is a great opportunity for northern Minnesota businesses and local units of government to learn how they can reduce wastes and costs."

-- Sandy Gunderson, Becker County Environmental Services Coordinator

Sponsors

U.S. Department of Agriculture Rural Development

Partners

Becker County Cass County St. Louis County Otter Tail County Rotary Clubs in Pelican Rapids & Perham Latino Economic

Development Center



MnTAP is assisting small communities in 53 Minnesota counties with solid waste reduction trainings and site asessments. Solid waste reduction assistance is more vital outstate, where resources are scarce and distances between them are great. Outreach to counties and civic organizations, such as Rotary Clubs and others -- including Chambers of Commerce, Explore Minnesota Tourism, the League of Minnesota Counties, and the Association of Minnesota Cities -- helped spread the word about the project.

Trainings were tailored to county-identified topic priorities, and solid waste assessments have been conducted at a wide range of businesses and organizations and institutions.

2013 Project Activities

Activities completed through this project include:

- Seven trainings for a combination of audiences, including businesses and local government staff
- Ten on-site solid waste assessments, in conjuction with the trainings
- Ten reports written and submitted to the companies and organizations that had assessments
- A 10-minute solid waste reduction training video, titled "How to Conduct a Waste Assessment: Tools to Reduce Waste and Save Money at Your Facility," was produced in both English and Spanish. Watch the videos on MnTAP's YouTube channel (search Minneosta Technical Assistance Program)

Future Plans

MnTAP will continue to offer solid waste training and assessments throughout rural Minnesota. Project deliverables in 2014 include three more training events and 10 more assessments, along with a final project report.



Project Success: Creation of Waste Reduction Training Videos

One of the project goals is to develop a plan for long term viability of assistance beyond the end of the project period. The challenge was to identify ways to condense and share the hours of live training expertise in an accessible format. A topic-specific how-to video was our answer.

Waste assessments (and waste sorts) are primary tools for solid waste reduction assistance. Our videos show how to conduct a waste assessment in a typical office setting.

A number of MnTAP staff and University of Minnesota Twin Cities campus locations were engaged in the filming. With the help of a great videographer, we learned about framing and taking shots, writing dialogue, lighting and flow. After many hours of consultation, two days of shooting and subsequent editing, our videos were complete. A Spanish version was produced through a partnership with the Latino Economic Development Center. We now have two highquality videos outlining a simple yet effective waste reduction strategy that can be viewed from anywhere in the state!

Motivating Manufacturing Energy Efficiency with Lean

2013 Outputs

2 lean project companies 2 student interns

2013 Outcomes

92,000 kWh \$8,800 savings

What they said...

"With the help of our MnTAP intern, Schwing America was able to facilitate lean manufacturing changes on the production floor."

-- Mark Moschkau, Director of Operations, Schwing America

Sponsor

Minnesota Department of Commerce, Division of Energy Resources

Project Overview

MnTAP partnered with lean service providers to help implement lean manufacturing principles, energy efficiency, and waste reduction at two companies, with a goal of reducing waste across their facilities. Lean manufacturing principles naturally lead to sustainability improvements, both in energy, water, and materials use reduction. Additionally, lean processes often decrease the energy intensity of a product when production rates increase.

2013 Project Activities

Some highlights of the 2013 lean projects:

- 5S implementation: Work areas were lined and shadow boards installed for frequently used tools, reducing time spent on tasks by being organized and having all the right tools and materials available for the job.
- Compressed air system upgrades: Improved filtration and zero-loss condensate drains were installed at one facility, and additional equipment upgrades were recommended by an outside auditor working with the intern.
- Set-up time reduction: Creating standardized set-up procedures with color coded, easy-to-read labels, diagrams and photographs helped reduce set-up time. which reduces production down-time and improves production efficiency.
- Transportation analysis: opportunities to reduce forklift travel were identified by studying travel patterns and evaluating the load utilization of each trip.



Project Success: Lean Process Training

Schwing America, an intern project host site, engaged with Enterprise Minnesota, the National Institute of Standards and Technology Manufacturing Extension Partner for Minnesota, to provide training to employees in GreenLean® methodology. This training enabled everyone from the executive sponsor to assembly workers, to work together to identify, communicate, and quantify opportunities for improvement. Opportunities were identified to optimize work cells using the 5S method and improve the efficiency of busy assembly workers. Outcomes included clearly lined floors, removal of clutter, and tools and materials placed in standardized locations. Other solutions identified included:

• Optimizing paint booth loading patterns to minimize energy usage, which can result in thousands of dollars per year of energy savings.

- Identifying and repairing compressed air system leaks, saving 21,000 kWh and \$2,000 per year.
- Reducing forklift travel, saving 390 gallons of fuel and nearly \$1,000 per year.

Water Conservation by Industrial Users

2013 Outputs

2 water conservation assessments 3 intern projects

2013 Outcomes

20.2 million gallons of water savings

What they said...

"The innovative work of the MnTAP interns in the industrial water conservation assessment project has resulted in large implemented savings at several companies."

-- Brian Davis, Metropolitan Council, Water Supply Planning

Sponsor

Metropolitan Council, with funding from the Clean Water, Land, and Legacy Amendment to the State Constitution

Project Overview

During 2012-2013, MnTAP implemented an email survey of selected industrial private well water users in the eleven-county metropolitan area. This survey provided information on how industry views its use of well water, whether water resources are a business priority, and what concerns, if any, industry has with its use of water. MnTAP conducted water conservation site assessments based on indications of interest from survey participation. In addition, three 2013 water conservation-focused intern projects were sponsored through this grant. Survey and project reports were compiled and reviewed by the sponsor, and the project was completed in January 2014.

2013 Project Activities

The following are a few highlights of project activities through 2013:

- Water conservation opportunities identified in 2013 assessments totaled 5.7 million gallons, for a potential project total from all 7 assessments of more than 77.6 million gallons of water annually.
- Three intern projects completed in 2013 identified water savings potential of 42 million gallons annually.
- True cost for water usage can be \$10-20/1,000 gallons when permit charges, discharge fees, and treatment operational costs are taken into consideration.

Survey Results

A survey of private metro-area water users indicated the following:

- Water supply quality is very important
- Currently, rules, regulations and costs of water are of greater concern than supply
- Cost of water is often not included in business decision-making
- Many companies have considered water conservation projects, but may not have defined goals



Project Success: Water Reduction at Potato Processing Plant

Northern Star Co. (Northern Star) processes approximately one million pounds of potatoes per day, and water usage figures heavily into every aspect of production.

A MnTAP intern reviewed how water conservation could save costs and improve efficiencies for the plant. With the intern's assistance, Northern Star is now on-track to reduce its water usage by 16 million gallons annually, with estimated cost savings of \$166,300.

The MnTAP partnership was part of a two-year study, whose final report, "Assessing the Opportunity and Barriers for Water Conservation by Private Industrial Water Users," was released in January. Read the full study for more information about how your business can reduce its water usage on the Met Council website at z.umn.edu/metcouncilwater.

Area SourceVOC Reduction

2013 Outputs

Develop project plan 5 sectors identified

2013 Goals

Support voluntary reduction of volatile organic compound (VOC) emissions at small to mid-size businesses across Minnesota through education and outreach activities.

What they said...

"The focus of this work aligns well with the goals of the Clean Air Minnesota project. MnTAP is well positioned to take a lead role in this effort."

-- Eric David, Nonpoint Air Lead, Minnesota Pollution Control Agency

Sponsor

Minnesota Pollution Control Agency

Project Overview

This project will identify functional non-VOC alternative products, implement training and conduct on-site technical assistance to reduce VOC emissions from area sources at small to mid-size businesses.

Project Scope

Activities associated with this project will consist of research, demonstration projects, training, and implementation assistance.

Research

- Identify functional alternatives to VOCs in target sectors
- Promote best management practices in VOC-intensive industries

Demonstration Projects

- Support trials of non-VOC products in several industry sectors
- Promote case studies of successful alternatives

Training

- Create sector specific FAQ sheets and alternatives guidelines
- Develop and conduct sector focused training events

Implementation Assistance

- Conduct broad-based technical assistance to multiple sectors
- Support businesses that want to switch to non-VOC alternatives by promoting funding opportunities

Project Scope

Sector	Emission	Outreach
Coating - industrial and automotive	Paints and solvents	Increase transfer efficiency Promote alternatives Provide best practices training
Degreasing - industrial and vehicle maintenance	Solvents (mix)	Identify effective alternatives Promote alternatives adoption
Fiberglass processing	Styrene	Provide best practices training Explore material options
Vegetable oil	Hexane(s)	Define performance opportunity Promote BMPs
Community-specific	Various	Identify outreach sectors Develop educational resources Promote alternatives and BMPs



Project Background

In preparation for the Clean Air Minnesota project, the Clean Air Dialogue work group developed a list of recommendations for improving air quality in Minnesota. One of the categories identified was reduction of area source VOC emissions, which are not regulated by permit and tend to be individually small. When taken together, however, they contribute significantly to overall VOC releases and subsequent ground level ozone formation. This work expands outreach and education activities aimed at small- and medium-size businesses to promote use of low VOC solvents and products.

ReUSE Minnesota

2013 Outputs

17 steering committee meetings held 3 events and meetings held 1 website built 2 social media pages built 5 materials printed

2013 Outcomes

43 new members

25 organizations represented

What they said...

"MnTAP's coordinating role was critical in getting ReUSE Minnesota off the ground and established as an independent non-profit organization."

-- Stacey White, ReUSE Minnesota Board President

Sponsor

MPCA Environmental Assistance grant

Establishing a New, Independent Organization

In 2012, MnTAP received an MPCA Environmental Assistance grant to help establish a statewide reuse association for Minnesota. Through the grant, MnTAP provided a half-time coordinator to support activities such as legal establishment of the organization, membership recruitment, outreach, and meeting and event planning. ReUSE Minnesota publicly launched in June 2013 with a mission to bring visibility to Minnesota's reuse, rental, and repair sector through networking, publicity, and events.

First-Year Accomplishments

2013 was a busy year for ReUSE Minnesota. Under the guidance of a steering committee, MnTAP led and supported a variety of activities for ReUSE Minnesota in 2013, including:

- Obtaining 501(c)(6) tax-exempt status from the IRS
- Holding seventeen steering committee meetings, including a strategic planning session
- Hosting a public launch event in June for over 100 attendees. The event was livecast online for outstate members and those who could not come to St. Paul.
- Facilitating two members' meetings in July and November
- Participating in five events to raise reuse awareness and recruit members: Iron Range Earth Fest, Junk Bonanza, Twin Cities Green Drinks, MN State Fair Eco Experience and MN Goes Green
- Giving interviews for print and television news coverage, resulting in five news articles, five blog posts, and one television news story (link: http://www.kare11.com/video/2499024237001/1/ReUSE-Minnesota-is-looking-for-reuse-partners)
- Recruiting new members through press exposure and direct mail/email
- Building and maintaining a website (www.reusemn.org) and social media pages on Facebook and Twitter
- Developing, printing and distributing five promotional and resource materials



Project Success: Connecting Reuse Businesses

ReUSE Minnesota now has over 40 business, non-profit, institutional, and individual members in sectors ranging from antiques to costume rentals to repair services. By connecting these parties and creating a unified message to promote reuse, rental, and repair, ReUSE Minnesota is strengthening a growing sector that benefits Minnesota's environment and economy.

"ReUSE MN is bringing business owners and organizations together that might not have ordinarily known about each other. As people from different reuse sectors get to know about each other's work, new opportunities and partnerships are created. I have learned about outlets for used clothing, shoes, and rag fabrics, which has helped us divert worn out costume pieces to places other than the waste stream. I also have a better sense of reuse sources and outlets in the community so I can refer others to those sources," said Alicia Wold, General Manager of CostumeRentals, a ReUSE Minnesota member.

Waste Management Assistance in Ramsey & Washington Counties

2013 Outputs

3 business assessments

2 outdoor event assessments 3 waste sorts

2013 Outcomes

1 expansion of organics diversion program

1 pilot organics program planned for 2014

5 recommendation reports provided

What they said...

"Working with MnTAP helped us realize how we could improve the composting program both short and long term."

--Sonia James, Environmental Specialist, Boston Scientific

Sponsor

Ramsey/Washington County Resource Recovery Project

Project Overview

MnTAP's work focused on outreach and assistance to food waste generators in Ramsey and Washington Counties. A MnTAP staff member provided assistance to three companies and two outdoor events in the region to assess opportunities and develop plans for implementation, including:

- Reviewing the effectiveness of current waste management systems
- Assessing reduction opportunities based on waste sorts, audits and observations
- Brainstorming ideas with sustainability and facilities staff
- Identifying opportunities to optimize programs or to implement new ones
- Providing reports to each engaged organization, with suggestions for waste reduction/diversion and recommended next steps

2013 Project Activities and Results

- Three waste sorts were conducted to establish baseline waste composition data or to assess current waste management effectiveness
- One business expanded its organics program to include more food waste and bathroom paper towels
- Eleven tons of organic waste and 3.5 tons of recycling were identified for potential annual diversion from three participating businesses
- One organization has planned a pilot organics collection program for an outdoor event in 2014



Project Success: Boston Scientific Expands Composting Program

During the 2013 solid waste project for Ramsey and Washington counties, Boston Scientific made significant strides in waste diversion. They began a pilot compost collection program for one of two campus cafeterias, as well as for bathroom paper towels from half of the buildings on their Arden Hills campus. They have since expanded efforts to include food waste from the second cafeteria, as well as bathroom paper towels from all but one building on the campus.

The company completed a waste sort with MnTAP in 2013 to assess the effectiveness of their current compost program and continues to look ahead at plans for further waste reduction and diversion from landfill. As a side benefit, the compost site that processes the waste has agreed to donate finished compost for Boston Scientific's on-campus garden, effectively closing the loop and bringing material back for use where it was initially consumed.



MnTAP Interaction Summary (Interns, Team Meetings, and Site Visits)