SOURCE
2018 Issue 1

University of Minnesota
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MnTAP's IMPACT in Minnesota

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MnTAP Strengthens Minnesota Businesses

Since 1985, MnTAP has contributed to Minnesota's economic well-being by reducing waste at the source through our Technical Assistance activities and training the next generation of engineers through the MnTAP Intern Program.

Here's a sample of what MnTAP accomplished in 2017:

Out of 113 site visits, MnTAP staff found ways to reduce:

- 300,000 lbs of hazardous waste
- 1.5 million kWh of energy
- 31.8 million gallons of water
- Total savings of $290,000

Our 17 interns found ways to save:

- 343,800 lbs solid waste
- 1.5 million kWh of energy
- 28.1 million gallons of water
- Total savings of $807,000

The Minnesota Materials Exchange supported:

- 50,000 lbs solid waste diverted from the landfill
- 77 successful exchanges

Read more about the impact MnTAP had in Minnesota last year in the **2017 IMPACT Report**: www.z.umn.edu/Impact2017. ■

The Impact of the Intern Program

Applause for the 21 businesses across Minnesota who chose to work with the MnTAP Intern Program in 2017. By implementing the recommendations identified by seventeen interns, supported by dedicated MnTAP staff, host companies could realize savings of over **$1,590,700 annually.**

Companies Reap Benefits from Interns' Work

Since 1985, MnTAP has been offering an intern program that places qualified students in facilities for up to three months. Participating businesses host an intern who researches and provides solutions for pollution prevention

continued on page 7

Know someone who'd like to read about MnTAP? Pass it along before recycling!

- ☐ health and safety
- ☐ maintenance
- ☐ owner/president
- ☐ process engineer
- ☐ purchasing

Opportunities

Sustainable Spirits

Reducing Environmental Impacts of Breweries and Distilleries

Minnesota has a long, diverse history in the brewing industry. Breweries and distilleries are found in every part of the state - from the tiny northwestern town of Hallock, not far from the Canadian border, to Blue Earth, just nine miles from the Iowa Border. The popularity of craft spirits has grown tremendously across the country. Minnesota alone has grown from five a decade ago, to 130 breweries and 21 distilleries in 2017.

On average it takes between 4-7 gallons of water to produce 1 gallon of beer

Brewing and distilling is an energy-and water-intensive process. And while this industry has set itself apart by seeking sustainable solutions from the start, a growing company may not have time to research the best efficiency process options for their site. MnTAP's current efforts have been helping some Minnesota brewers and distillers find environmentally sustainable opportunities for energy, water, waste, and wastewater effluent cost savings and then maintain best practices in the future.

In 2017, two of MnTAP's interns worked directly with micro-breweries. Over the 12 weeks they were at the facilities, they researched and recommended ways to save the facilities over 125,500 kWhs at a savings of $13,380 per year and 503,000 gallons of water at an annual savings of $14,400.

Some of their recommendations were:

- Use the clean internal rinse water from beer cans to clean the exterior of the cans. Reclaiming and reusing this water will save over 150,000 gallons per year in city water usage.
- Sending cold and hot trub to an evaporator, mixed with spent grain and sell as animal feed.
- Adding a heat exchanger with a glycol loop to cool and reuse vacuum pump water to save up to 220,000 gallons of water per year.

This year an intern will be working with Phillips Distilling Co. to evaluate and verify sources of water and wastewater, then make recommendations to reduce and/or reuse the wastewater. If you are an owner or employee of a brewery or distillery, and are interested in a free assessment, contact **Michelle Gage** at 612-624-4619 or mcgage@umn.edu.

For more information about our sustainable spirits projects go to: www.mntap.umn.edu/industries/facility/brewstill/ ■

Cleaning Up in the Phillips Communities

Small businesses account for almost 1/3 of air pollution emissions in Minnesota. MnTAP will again be working in the Phillips communities on a project helping to identify pollution prevention and improvement opportunities. Working directly with small cleaning and janitorial businesses, an intern and our staff will discuss and recommend products with lower hazardous air pollutants (HAPs) and volatile organic compounds (VOCs). Reducing air emissions has positive impacts for general population health and the environment.

MnTAP's intern will work with small businesses such as janitorial and cleaning to identify sources of air emissions, then create and carry out strategies to reduce these sources without compromising performance.

Specifically, the interns will:

- Evaluate chemicals and make recommendations for greener/safer options, or reducing their use.
- Set up free trials of recommended chemicals.
- Assess energy use in lighting, ventilation, and fans & motors
- Assess waste levels and suggest ways to eliminate waste all together, reuse, or recycle.

If you are an owner, employee, or a customer of a small or large cleaning and janitorial business in the Phillips Communities and are interested in a free assessment, please contact **Jane Paulson** at 612-624-1826 or janep2@umn.edu now to reserve your spot! Or, find out more at MnTAP's air basics web page: www.mntap.umn.edu/focusareas/air/airbasics/ ■

Safer Products

Reducing Air Pollution in North Minneapolis

Locally, poor air quality affects Minnesotans by triggering a range of health problems, from itchy throats to asthma attacks. It also contributes to smog and acid rain, leading to the contamination of water bodies. That's why MnTAP is teaming up with University of Minnesota Urban Research and Outreach-Engagement Center (UROC), and the West Broadway Business and Area Coalition, to work with businesses in North Minneapolis to reduce hazardous air pollutants and chemicals, increase worker safety, and improve the air.

Last summer, an intern from MnTAP worked with auto shops in South Minneapolis' Phillips Communities to promote adoption of less toxic, lower-emission degreasing solvents, which are commonly used to clean or degrease machinery and automotive parts and found solutions to avoid 860 pounds per year of hazardous air pollution being released in to the neighborhood.

This spring and summer, MnTAP will be working in North Minneapolis with local auto repair shops and other businesses to identify the safest products available that still get the job done. Shops interested in taking advantage of this opportunity receive a free assessment of their current products, samples for testing safer products, and if they choose to make a change, free product to get started.

If you are an owner/employee of an auto repair shop or other business that uses cleaners and degreasers, or have a recommendation for your favorite auto repair shop, please call **Michelle Gage** at 612-624-4619 or mcgage@umn.edu, now through June 2018.

Or, find out more about the project at: z.umn.edu/2017-PhillipsNeighborhood. ■

Minnesota Materials Exchange

The Minnesota Materials Exchange is a website that links organizations that have reusable goods they no longer need to others who can use them. This free reuse network helps prevent usable materials from becoming waste and saves users money. The exchange is open to all Minnesota organizations from small non-profits to Fortune 500 corporations, self-employed contractors to state agencies, schools, business associations, and manufacturers large and small.

A Success Story

"One of our ministries, the Bunk Bed, provides bunk beds to families with children, was down to just two twin mattresses. Earlier that day I had just happened to look at the Minnesota Material Exchange and saw that Concordia College had a large number of twin mattresses they had to phase out of their system! We now have 50 twin mattresses!."

- Greg Wede, Love INC of Worthington, (partnership of 19 churches)

Over the past 27 years, there have been many changes to the exchange, starting as paper lists to the current convenient online format. The exchange has diverted almost 800,000 pounds of waste from our landfills, saved our 4,000 members purchasing and disposal costs, and freed up a lot of storage space. Below is a small list of what has been "relocated" through the service:

- building & construction
- chemicals & cleaners
- classroom supplies & fixtures
- commercial appliances
- computers and office equipment
- fixtures and parts
- industrial & agricultural by-products
- medical & lab equipment
- motors, pumps
- office supplies
- paints, coatings & stain
- plastics, rubber & composites
- raw materials
- shipping & packing
- tools & manufacturing equipment

So don't assume that nobody wants your unused materials; you may be surprised! Contact **Nathan Landwehr** at 612-624-4697 or landwehr@umn.edu to learn more and save on disposal fees.

Sign on to MME, www.mnexchange.org to get updates on new postings and weekly newsletters. ■

Water Efficiency

Perfecting Pea Processing

Seneca Food Corporation's product recovery program aims at maximizing the amount of food that ultimately becomes either canned or frozen. The Rochester, MN facility gave their 2017 MnTAP intern the goal of reducing food waste, while improving the efficiency of water, chemical, and energy usage. Food waste can occur for a number of different reasons, such as: processing product, transporting losses, and can sealing failures. By quantifying the loss of good product during processing, recommendations were made to improve production in areas of high impact.

MnTAP's intern, Daniel Chang, identified three main areas to increase efficiency and reduce waste. The first was the amount of good food being lost during sorting. A Color Sorter is used to electronically view the food and sort the good from the bad. By tightening control of the Color Sorters and installing display monitors on the production floor so technicians could quickly adjust each Sorter, the company recovered 18 tons of peas as product and saved $18,000 by the end of pea production.

Similarly, Chang made recommendations for the canning process and use of defoamer chemical, which when implemented will result in savings of almost 15,000 lbs of chemicals with a value of over $10,000. With these recommendations Chang helped the company move toward their product recovery program goals.

To read more about the project, go to: z.umn.edu/2017-seneca-pdf ■

Finding Lost Water

Based on water utility bills for the 2015-16 year, DiaSorin, Inc, in Stillwater, MN, consumes approximately 8.5 million gallons per year of water both for its manufacturing and domestic needs. They use this water to develop, produce and commercialize diagnostic tests for use in the immunodiagnostics and molecular diagnostics markets.

MnTAP intern, Yohanes Agustinus, looking for leaks.

The company knew that 37% of incoming water was unaccounted for and wanted a better understanding of their water usage. The goal of the MnTAP intern, Yohanes Agustinus, was to identify major water-consuming areas in the facility, and then recommend possible water reduction strategies.

The recommendations made by the intern ranged from large to small repairs and changes. Repairing the vacuum system and establishing on-demand use saved 3,700,000 gallons of water and $27,400 per year. Installing ultra-low flush toilet bowls would reduced domestic water consumption by 20%. This saved the facility 747,500 gallons of water and $5,200 annually.

So, Agustinus was able to find DiaSoran's "lost" water, and save them an additional 803,000 gallons more!!

Read more about this project at: z.umn.edu/Diasorin-2017-pdf

Or, if you'd like to have a water assessment at your facility, contact **Matt Domski** at 612-624-5119 or domsk004@umn.edu. ■

Save the date for the 2018 Intern Symposium August 16, 2018

Watering Plants Efficiently

Bailey Nurseries is a locally owned and operated wholesale plant nursery. They are known for their diverse market, growing everything from woody ornamentals to perennial flowers. In order to grow all those plants, the nursery uses a lot of water! They had our intern focus on water conservation and reuse opportunities for their two farm properties in southern Washington County.

At the Nord Farm, the project was to map the rain flow and drainage system on the property. MnTAP intern Christine Pelto, proposed a pond pumping and treatment system to reuse and recycle irrigation and rain water. This would reduce the amount of water pumped daily from the groundwater table, and reduce runoff and sediment. There is potential for Bailey's to save 38 million gallons of water per year at Nord Farm. ■

Irrigating at the Nord Farm

5 Intern Water Projects in 2018

- **Aveda:** Evaluate clean-in-place and sanitation room processes for effectiveness and efficiency.
- **Thomson Reuters:** Quantify the use of water within process and comfort heating and cooling loops.
- **City of Woodbury:** Evaluate the effectiveness of pressure-regulating irrigation nozzles on residential irrigation systems.
- **North Memorial:** Evaluate facility water usage at North Memorial Health Hospital and Maple Grove Hospital.
- **Science Museum of Minnesota:** Evaluate total facility water usage, including domestic fixtures, irrigation systems, and rainwater reuse opportunities.

Get Ahead of the Watering Curve for Spring and Summer

You might be surprised by how much water you actually use on a lawn. Watering the grass or plants, cleaning the sidewalks or parking lots can consume thousands of gallons of water every year. Conserving water is smart for the planet and for your budget. Experts estimate that 50% of the water used in landscape irrigation is wasted through over watering.

Here are some simple irrigation tips that you can use to save water:

- Set automatic sprinklers to do a "Cycle and Soak." Program the timer to water in 2-3 short cycles rather than a single long period of time. Watering in increments gives the soil adequate time to soak up water, and the already moist soil will allow water to travel even deeper to the roots. For example, if you normally water for 15 minutes:
  - water for 4 minutes
  - wait 30 minutes for it to soak in
  - water another 4 minutes, wait again
  - finally, water for another 4 minutes
  - now you have watered a total of 12 minutes rather than 15.
- Reduce the use of fertilizers. Fertilizers encourage rapid growth which results in higher water use. Plus, reducing fertilizer keeps nitrates and other chemicals out of the water supply.
- Don't put debris, yard clippings, or leaves down storm drains. ■

For more information about good irrigation practices, watch a video from the University of Minnesota Extension: https://vimeo.com/245375800

MnTAP news

Staff Snapshot: Mick Jost, Senior Advisor

Mick Jost has spent his +40 year career involved in various kinds of environmental work, including environmental site remediation, emergency spill response in the private sector, and the last 25 years in pollution prevention project management at MnTAP.

When he joined in 1991, his focus was on proper waste management and regulations. With MnTAP, his perspective changed to pollution prevention. If it's not created in the first place, there's no need to manage it. In a way, he says, it's similar to taking a vaccine before getting sick, instead of treating the disease once infected.

One of his more memorable projects was working with the Minnesota Army National Guard on equipment maintenance shop issues in developing their first pollution prevention plan. He visited a lot of training facilities, including Camp Ripley and the Army Aviation Support Facility in St. Paul. Mick recalls it as a ". . . huge learning experience and a distinct honor to work with all the military and civilian personnel I met during those projects."

Today, the many environmental issues we face command competing attention. With new technology, Mick says, we're better able to measure the interdependence and compounding of effects of pollution and find better ways to prevent it.

Working with interns over the years has been rewarding for Mick. There are many business and industry processes that have never been optimized and MnTAP interns are encouraged to pursue root causes that will improve economic and environmental outcomes. They are the people who will carry pollution prevention message and work forward.

Mick will be retiring in July of this year. We will miss him and his expertise, but wish him well in his next endeavors. ■

Good Advice from 2012 -

Squeeze the most from every drop:

Water conservation tips for your business

- Turn water off when not in use
- Review your clean-in-place system
- Train your employees about water conservation
- Create incentives for employees to reduce water use
- Understand your water flow
- Reuse water
- Use high-pressure, low- volume wet cleaning systems
- Optimize nozzle type for your application
- Prevent leaks.

Read more on how to maximize your water use at: www.mntap.umn.edu/resources/green/water ■

Intern Program

The Impact of the Intern Program, cont. from page 1

and energy efficiency at low cost. These solutions are designed to be specific to the facility and feasible. Very often, the savings realized from implementation far outweigh a company's cost-share.

To give you a better understanding of the benefits of this program, we asked host companies to comment on their experience in 2017 - here's what they said.

An Extra Set of Eyes

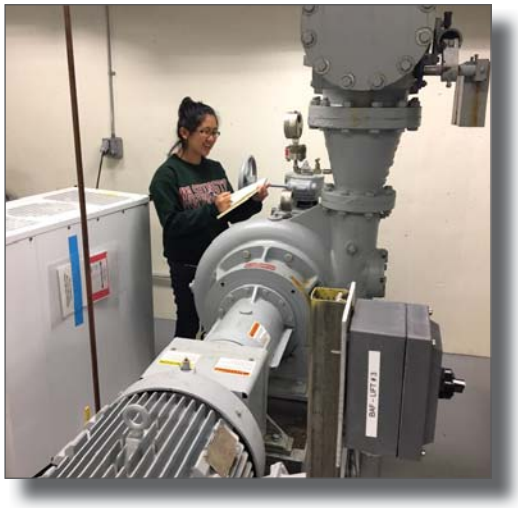
When asked why a company would invested time, money, and personnel to intern projects, several companies responded that they needed someone to address a waste reduction and energy efficiency project without having to commit current or new staff. An intern can make suggestions that improve efficiency, save money, reduce waste, or decrease regulatory compliance burden. Also, an intern has the time and creativity to research alternative equipment, procedures, chemicals, and raw materials.

"MnTAP allowed us to work on an identified project that we did not have the resources to focus on. Our intern was able to arrive at comprehensive and cost effective solutions. With these solutions, there are many opportunities to benefit not only the environment, but also the business. We will likely be identifying additional projects and utilize the program again."

- Nick Bergman, Continuous Improvement Officer, Electric Machinery Company

A Qualified, Independent Problem Solver

In addition to being able to devote one person solely to a project, the companies noted that their interns have been qualified, motivated, creative, energetic, and ready to try out what they've learned in the classroom on a real world setting.



"CertainTeed strives to minimize the impact of manufacturing operations on the environment. Having a highly skilled MnTAP intern working on this project has allowed us to refocus our environmental efforts. Without this program, we would not have been able to study water usage in as much detail and with as much technical thought and analysis.

- DJ Damberger, Plant Manager, CertainTeed

Positive on the Facility and Environment

While each MnTAP intern has a specific project to focus on, quite often the interns' impacts on facilities have gone beyond their project.

"Air quality is an extremely important issue in the Phillips Community of Minneapolis as the neighborhood has long suffered adverse environmental impacts. Our intern was tremendous at making connections with small business owners and getting folks on board with the idea of switching to safer products to benefit the local environment."

- Will Delaney, Associate Director, Hope Community

Intern Projects in 2018

MnTAP will be supporting 14 projects this summer in industrial water efficiency, process optimization in the food industry including chemical use, energy and water efficiency, as well as tailored assistance to large and small businesses throughout the state. Projects are financially supported through a variety of partnerships including counties, utilities and industry associations to name a few.

Contact **Nathan Landwehr**, MnTAP's intern program coordinator, at 612-624-4697 or landwehr@umn.edu, to find out how you can help bring MnTAP Interns to the businesses you serve. ■

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Minnesota Technical Assistance Program

The Minnesota Technical Assistance Program (MnTAP) strengthens Minnesota businesses by maximizing efficiency and reducing costs through energy, water and waste reduction. As an outreach program at the University of Minnesota, MnTAP provides technical assistance tailored to individual businesses. By reducing waste and increasing efficiency, companies save on disposal and raw-material costs and make working conditions healthier and safer for employees.

MnTAP is funded primarily by the Minnesota Pollution Control Agency's Resource Management and Assistance Division and is located at the University of Minnesota in the School of Public Health, Division of Environmental Health Sciences.

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.

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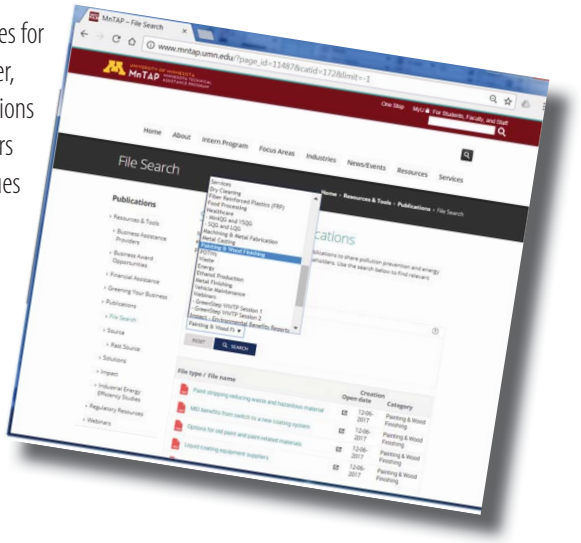
Searching for Information or Resources?

Part of upgrading our website was to provide visitors with an easy way to access information and to establish our site as a source of information for those looking to learn more about energy efficiency, pollution prevention, and saving money by working more efficiently.

The new publications database provides for a more dynamic experience for the user, allowing access to over 1,000 publications MnTAP has created over 32 years. Users also have a quick way to find back issues of our *Source* newsletter, the *Solutions* magazine, and the many reports and case studies written over the years.



For example, you can now easily find a fact sheet on energy saving tips for motors, or a handout with products that have low or no hazardous air pollutants, or the results of any of our past intern projects.

Try it – you never know what you'll learn!

Editor: Carol Wiebe. Contributors: Laura Babcock, Matt Domski, Karl DeWahl, Michelle Gage, Mick Jost, Nathan Landwehr, Paul Pagel, Jane Paulson, AJ Van den Berghe, and Jon Vanyo.

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