

POLLUTION PREVENTION

INTERN PROGRAM

2014 ANNUAL REPORT



Fourteen upper-level engineering students teamed with the Department of Natural Resources' 2014 Pollution Prevention Intern Program to help companies meet their environmental objectives. The intern program is an extension of DNR's Pollution Prevention Services, a non-regulatory program that offers confidential technical assistance to Iowa business and industry.

Working on site at top Iowa companies, interns identify strategies to reduce solid and hazardous waste, water and energy use, air emissions and greenhouse gases. Interns research and recommend process improvements that will lower operating costs and improve the environmental performance of host companies. The interns offer a fresh perspective and innovative solutions while gaining valuable experience.

This year, the interns identified opportunities that could save companies more than \$5.5 million annually. Of these, projects estimated to save \$1.6 million annually were already implemented or are in progress.

The program offers both 12-week and 24-week projects each year. Interns at Hy-Vee, Inc., John Deere Ottumwa Works and Nutra-Flo Company completed 24-week projects in 2014. Additional time on site allows interns to conduct more in-depth research, collect data over time and evaluate systems through varying conditions.

Results of the 2014 projects continue to demonstrate that actions to increase environmental stewardship can also reap financial benefits. We thank the 2014 host companies for their partnership and continued pursuit of environmental excellence.

2014 IMPLEMENTED SAVINGS

CATEGORY	REDUCTION	UNIT	COST SAVINGS
WATER CONSERVATION	440,276	GALLONS	\$2,179
SOLID WASTE	1,172	TONS	\$179,854
SPECIAL WASTE	179	TONS	\$35,121
HAZARDOUS WASTE	219	TONS	\$1,343,111
ENERGY	1,509,764	KWH	\$62,884
OTHER			\$6,400
			TOTAL: \$1,629,549

AIR POLLUTANTS AND GREENHOUSE GASES IN METRIC TONS:

CONVENTIONAL AIR POLLUTANTS DIVERTED IN METRIC TONS			
SO ₂	NO _x	VOC	PM ₁₀
3.42	1.62	1.05	0.18
GREENHOUSE GASES DIVERTED IN METRIC TONS			
CO ₂	CH ₄	N ₂ O	CFC
2,454.80	268.84	5.76	7.82

Note: Air emissions and greenhouse gases represent life cycle estimates and include external activities such as purchasing utilities. Totals do not solely represent emissions generated at the plant sites.

2014 PROJECT AREAS (IMPLEMENTED)

- Lighting retrofits
- Boiler efficiency
- Heating and ventilation effectiveness
- Air compressor efficiency
- Replacing hazardous chemical with less toxic alternatives
- Interior and exterior thermographic analysis
- Solid waste reduction and management
- Process improvements
- Water usage and wastewater treatment
- Air conditioning usage

COMPANY TESTIMONIALS:

"We could not be more pleased with the outcome of the project. The intern far exceeded the objectives by her diligent efforts. This is a great program and I'm thrilled we were able to participate."

— Tonya Burgess, Sivyer Steel Corporation



FULL CASE STUDIES MAY BE VIEWED AT:
WWW.IOWAP2INTERNS.COM

Iowa Department of Natural Resources





SUMMARY OF 2014 PROJECTS

ANTHONY JOHNSON
INDUSTRIAL ENGINEERING
THE UNIVERSITY OF IOWA



AMERICAN POP CORN COMPANY **SIoux CITY**

The American Pop Corn Company produces the globally recognized brand of Jolly Time® popcorn. The family-owned company was founded in 1914 and currently employs more than 180 people at the Sioux City campus. The intern made recommendations to improve process efficiency and reduce waste going to the landfill. Recommendations included paper recycling, a quality assurance adjustment and a modification to a skimmer belt used to remove oil from wastewater.

JOSEPH REINERT
MECHANICAL ENGINEERING
IOWA STATE UNIVERSITY



BRIDGESTONE AMERICAS TIRE OPERATIONS **DES MOINES**

Bridgestone Americas Tire Operations is a global leader in tire production. Across the Americas, the company has over 50 production facilities, operated by more than 43,000 employees. Bridgestone's Des Moines facility is the largest agricultural tire manufacturing plant in the country. The intern conducted an assessment of water use at the facility and recommended strategies to reduce usage and assist with meeting corporate reduction goals. His recommendations included changes to the production process and upgrades to the cooling towers and restroom facilities.

HAYLEY GIGOUS
SUSTAINABILITY AND RENEWABLE ENERGY SYSTEMS
UNIVERSITY OF WISCONSIN - PLATTEVILLE



HY-VEE, INC. **WEST DES MOINES**

Founded in the 1930's, Hy-Vee, Inc. has grown to become one of the top 25 supermarket chains in the U.S. with more than 240 retail locations in eight states. Over 69,000 employees across the Midwest work to deliver the company's mission: "making lives easier, happier, and healthier." The intern reviewed recycling efforts at various Hy-Vee, Inc. retail stores, focusing on rigid plastics, cardboard and food waste. Opportunities to increase diversion rates were evaluated and toolkits were created to maximize recycling efforts in the stores.

JOSHUA PLUMMER
MECHANICAL ENGINEERING
UNIVERSITY OF WISCONSIN-PLATTEVILLE



JOHN DEERE OTTUMWA WORKS **OTTUMWA**

Deere & Company began in 1837 as a one-man blacksmith shop. It has since become a Fortune Global 500 company, employing more than 67,000 people globally. The company produces a variety of heavy machinery that is used around the world. At the company's Ottumwa, Iowa, plant, the focus is on agricultural equipment, including windrowers, mower conditioners, round balers, and square balers. The intern conducted an analysis of motors used at the facility and made recommendations to improve efficiency and reduce energy usage. His recommendations included synchronous-belt drives on motors, equipment replacement, and converting outdoor lighting to LED fixtures.

KIMBERLY SCHERBER
ENVIRONMENTAL ENGINEERING
IOWA STATE UNIVERSITY



NUTRA-FLO COMPANY
NORTH SIOUX CITY, SOUTH DAKOTA

Nutra-Flo, a subsidiary of Kay-Flo Industries, is one of the largest independent liquid fertilizer manufacturers in the Midwest. In addition to fertilizer products, the company makes high protein animal feed for global distribution. The intern evaluated recovery and water treatment methodologies to reduce nutrient concentrations in the discharged wastewater. Implementation of the intern's recommendations will significantly reduce nutrients in the wastewater, assist the company in meeting environmental goals, and reduce operating expenses.

LOGAN DERBY
MECHANICAL ENGINEERING
THE UNIVERSITY OF IOWA



PROCTER AND GAMBLE
IOWA CITY

Founded in 1837, Procter and Gamble has grown to become the world's largest producer of consumer goods. Procter and Gamble's product line is vast, including beauty, health, and household care lines. In 1956, Procter and Gamble opened a plant in Iowa City, which now employs more than 600 people. The intern conducted a feasibility study of the reverse osmosis water treatment system. Findings showed that adding a second pass system could reduce annual water use at the plant by more than 10 million gallons. The intern also evaluated the energy reduction resulting from using preheated water to generate additional cost savings.

BAILEY HADNOTT
ENVIRONMENTAL ENGINEERING
THE UNIVERSITY OF IOWA



RYKO SOLUTIONS, INC
GRIMES

Ryko Solutions is a major provider of technical services, car wash chemicals, cleaning products, and product marketing. The company is North America's leading car wash equipment and service provider. At the company's Grimes, Iowa, headquarters, approximately 100 people work to create products for a global market. The intern conducted a waste stream analysis and recommended strategies to reduce disposal costs and improve process efficiency. Recommendations integrated source reduction methodologies, reuse of materials, and recycling strategies to significantly reduce waste generated at the facility.

KATE KENNEDY
MECHANICAL ENGINEERING
IOWA STATE UNIVERSITY



CITY OF SIOUX CITY – WWTP
SIOUX CITY

The Sioux City Wastewater Treatment Plant serves communities in three states, including Iowa, Nebraska, and South Dakota. The plant processes an average of 12.5 million gallons of wastewater per day. In addition to serving communities, the plant also monitors wastewater from 37 local industries. The intern was instrumental in resolving flow disruptions in the biogas combustion path. Once corrected, the intern was able to assess the feasibility of a combined heat and power unit at the plant. Recommendations were also made for upgrades to the lighting system and improvements to maintenance procedures.

HENRY KELLEY
MECHANICAL ENGINEERING
IOWA STATE UNIVERSITY



SHEARER'S FOODS, INC.
BURLINGTON

Shearer's Foods Inc. is a privately owned manufacturer of private-branded saltine crackers, wire-cut cookies and sandwich cookies. The West Burlington facility employs more than 800 people over three shifts. The intern researched technologies to capture the thermal energy put off by the ovens and reuse it for heating water and intake air in other parts of the plant. When implemented, the plant will substantially reduce energy consumption and associated utility costs, while achieving a closer air balance in the plant.

MEGAN MELBYE
ENVIRONMENTAL ENGINEERING
UNIVERSITY OF WISCONSIN-PLATTEVILLE



SIVYER STEEL CORPORATION
BETTENDORF

Sivyer Steel Corporation was established in 1909 as one of the first large steel foundries in the United States. The company develops custom steel castings and components for military, mining, energy, construction, railroad, perimeter security, and wear part use. The intern conducted an analysis of landfilled solid waste streams. Procedures were implemented that will divert more than 178 tons of material annually from the landfill, which will move the company significantly closer to its goal of achieving zero-landfill status.

STEVEN ZIMMERMAN
MECHANICAL ENGINEERING
IOWA STATE UNIVERSITY



TYSON FOODS, INC.
COUNCIL BLUFFS

Tyson Foods, Inc. is one of the world's largest producers of meat and poultry goods. At the Council Bluffs plant, Tyson Fresh Meats employs 875 people, who process beef and pork into packaged products that are ready for consumers. The intern used an ultrasonic leak detector to locate leaks in the compressed air system and tag them for repair. Controls, fixtures, and pump size were also evaluated to improve the efficiency of the generation and distribution portions of the system.

CRAIG SADLER
INDUSTRIAL ENGINEERING
THE UNIVERSITY OF IOWA



WEST LIBERTY FOODS, LLC.
WEST LIBERTY

West Liberty Foods was founded in 1997 by the Iowa Turkey Growers Cooperative. Along with processing turkeys, West Liberty Foods produces all types of cooked and ready-to-eat meat products. The West Liberty, Iowa, location also houses a research and development center and a state-of-the-art quality assurance lab. The intern conducted a survey of the plant's motors and evaluated the efficiency of each motor. The compiled data was used to prioritize efficiency upgrades or replacement for each motor to improve operating efficiency and reduce utility costs.

ALEX GEORGE
CHEMICAL ENGINEERING
IOWA STATE UNIVERSITY



WINNEBAGO INDUSTRIES
FOREST CITY

Winnebago Industries operates the largest facility for motor home production in the United States. The company, headquartered in Forest City, Iowa, employs 2,680 people on its two million square-foot campus. The majority of all components used in the RV units, such as holding tanks, bumpers, furniture, and cabinets are made from scratch on site. The intern developed process improvements to increase the efficiency of waste collection procedures and optimize landfill diversion at the Forest City plant. Recommendations addressed collection and consolidation procedures, options for challenging waste streams, and negotiation of vendor contracts.

ERIC IVERSEN
MECHANICAL ENGINEERING
THE UNIVERSITY OF IOWA



ZOETIS
CHARLES CITY

Zoetis is a global animal health company that delivers quality medicines and vaccines, complemented by diagnostic products and genetics tests and supported by a range of services. Production at its Charles City, Iowa, plant began in 1946, where the company now employs more than 400 people. The intern conducted an analysis of the compressed air system and recommended improvements to optimize the operating efficiency. Recommendations addressed optimization of the system pressure, upgrading condensate drains and fixture retrofits for end-use applications and an on-going leak management plan.



THE IOWA DNR IS AN EEO/AA EMPLOYER



DANIELLE DILKS
INTERN PROGRAM COORDINATOR
POLLUTION PREVENTION SERVICES

Iowa Department of Natural Resources
502 East 9th Street
Des Moines, Iowa 50319-0034

www.iowap2interns.com