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-Noel Camp, Plant Manager, Johns Manville Industrial Insulation Group

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To Noel Camp, “it was like winning a state championship.” That was the day Johns Manville, a Berkshire Hathaway company, received the 2015 24-Karat Gold Award, an honor bestowed on only one ELP Gold Leader each year.

“The pride that the award brings to each individual who worked on the project is truly amazing,” said Camp, plant manager for Johns Manville’s Fruita factory and who headed up the award-winning waste-diversion project. “For some members of our team, this will be the pinnacle achievement of their career. When you think about it, this team delivered a state championship effort that gives back forever. It’s a wonderful accomplishment.”

The company received the honorary award for “designing out” waste from the production of its high-temperature insulations. If we go back a couple years, the level of factory waste generated at the Fruita plant was about 1.8 million pounds (863 tons)





annually. Today, that once landfill-destined material is reintroduced into production lines and 100 percent reused.

### Harnessing everyone's ideas and energy

When asked what it took to eliminate factory waste streams, Camp doesn't hesitate to reply: it was our team atmosphere.

"Harness the ideas of everyone" are words you are likely to hear when you talk to Johns Manville's leadership team. Such values travel easily throughout the workplace, uniting employees and inspiring substantial change.

"This project involved everyone – from our entry-level hourly labor person to our CEO. I listened to my operators on the work floor, my maintenance mechanics, my engineers, my environmental council, my executive team," Camp explained. "It's the idea of embracing all perspectives, so everybody can own the success of doing something for a greater cause. That's what it takes to deliver truly sustainable solutions."

That grand-scale team effort paid off.

## Unlocking the value of factory waste

Johns Manville's Fruita plant produces two high-temperature insulations – Thermo-12® Gold and Super Firetemp® – for a wide variety of industrial applications such as petrochemical refinery and fire protection uses.

For nearly four decades, the facility had disposed of manufacturing waste in local landfills by way of the factory's 3-acre waste impoundment complex. In early 2013, the plant needed to align the complex with the State of Colorado's revised waste impoundment regulations, which prohibited continuing the operation of the almost 40-year-old complex as it existed. The company had a choice of either replacing the impoundment complex, upgrading it, or eliminating it.



Aerial view of the eliminated 3-acre waste impoundment complex at the Fruita plant.

Camp set his sights on the last option — eliminating the waste impoundment complex entirely.

### CHALLENGE: RECLAIMING WASTE

Johns Manville manufactures high-quality calcium-silicate insulations and produces an aqueous calcium-silicate stream as part of its manufacturing process.

Historically, the calcium-silicate stream would leave the manufacturing plant by flowing through a process water system. The system routed this calcium-silicate water stream to a pond within the impoundment complex. While in the pond, the heavier-than-water calcium-silicate solids would gravitationally separate from the water. Once the pond was full, the pond was dewatered and the calcium-silicate solids extracted and disposed of as municipal solid waste.

Plant manager Camp summed up his mission: “That material accumulating in the impoundment complex was in fact good calcium-silicate insulation material. What I considered imperative was to understand how to separate the calcium silicate in a more efficient and rapid manner so that we could instantly reuse it. Accumulating calcium-silicate solids over an extended period of time doesn’t allow for the solids to be reused in the manufacturing process. But if you can separate the solids and rapidly reintroduce them, you get virgin raw material.”

### SOLUTION: NEW PROCESSES FOR REUSING RECOVERED MATERIAL

In May 2013, Camp put the best talent to work on thinking through the variety of issues that needed to be solved. This was no small exercise, because most employees were convinced the task was impossible. There were 22 touch points in the two separate factory lines, and recovering leftover calcium silicate quickly presented many complicated challenges.

“But I had confidence it could be done. I knew we’d succeed as long as the team was willing to try, fail, recover and try again,”

## ENVIRONMENTAL VALUE

- Diverted about 1.8 million pounds (863 tons) of landfill waste annually.
- Reduced emissions of carbon dioxide (CO<sub>2</sub>) by more than 270,000 tons annually.
- Restored the impoundment complex's site to its natural state: excavated and reseeded it with native grass mix.

## ECONOMIC VALUE

- Paved the way to cost savings of \$374,000/year and a net return in excess of 30 percent on a \$630,000 investment, resulting from:
  - a reduced need to purchase 1.8 million pounds of raw material annually.
  - a reduced need for labor required for the excavation, transport, and disposal of waste materials.
- Created additional employment for local analytical laboratories, welders, pipe-fitters, concrete/construction workers, electricians, and manufacturers of process equipment.

## SOCIAL VALUE

- Eliminated the potential for waste impacts to ground water or the Colorado River.
- Reduced consumption of energy and raw materials.
- Extended the availability of existing solid waste landfills on the Western Slope.

said Camp. "The added challenge was that it had to be completed in such a way that not a single customer would be adversely impacted."

To speed up the capture of calcium silicate, the team turned their attention to processes that could separate out the material within the four walls of the factory, rather than in an outdoor impoundment complex. This required re-sequencing several production operations and making equipment changes, as well as installing new technologies such as a state-of-the-art power press hydraulic system.

[View a slide show for details on the process-design and equipment changes.](#)

Camp described how they then conducted numerous design experiments to identify an optimized formulation for the reused material. Once they found a recipe that processed well, the team performed further proof-of-concept trials to verify that the new recipe met all product specifications, protecting their customers' investments.

By March 2014, they successfully completed the trials and began reusing as raw material what was previously considered calcium-silicate waste.

"The recaptured calcium silicate isn't even treated. It's the same quality as virgin raw material, with the same material performance. It's simply separated out and totally reused as is," Camp stated.

Soon afterwards, the plant excavated the impoundment complex, which was no longer needed, and began restoring the area to its natural state.

## RESULTS: VALUE RECOVERY

Johns Manville made tremendous sustainable gains by prioritizing waste elimination and reusing the calcium-silicate stream as raw material. This strategy presented a true sustainability advantage in the form of environmental, economic, and social value.

# Use your influence to lead Colorado to a better environment

Apply soon! The application deadline for the 2016 24-Karat Gold Award is Aug. 17, 2016.



Gold Leader companies honored with a 24-Karat Gold Award have an effect that extends far beyond their own organizations. Award winners are viewed as the gold standard in Colorado environmental leadership. Our goal is to recognize these leaders in the hope that they will inspire change for others.

[Tell us your story.](#)  
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If you are an exceptional ELP Gold Leader, we invite you to submit an application for the 2016 24-Karat Gold Challenge Award. *The deadline is Wednesday, Aug. 17, 2016.* For more information, please contact Lynette Myers at [lynette.myers@state.co.us](mailto:lynette.myers@state.co.us).