

# Water Conservation

## Michael Foods – Northern Star Co.

Alex Hoppes

Advisor: John Polanski

Minnesota Technical Assistance Program

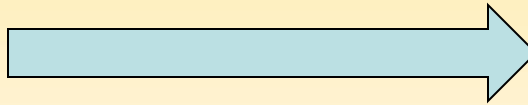


UNIVERSITY OF MINNESOTA

**Driven to Discover<sup>SM</sup>**

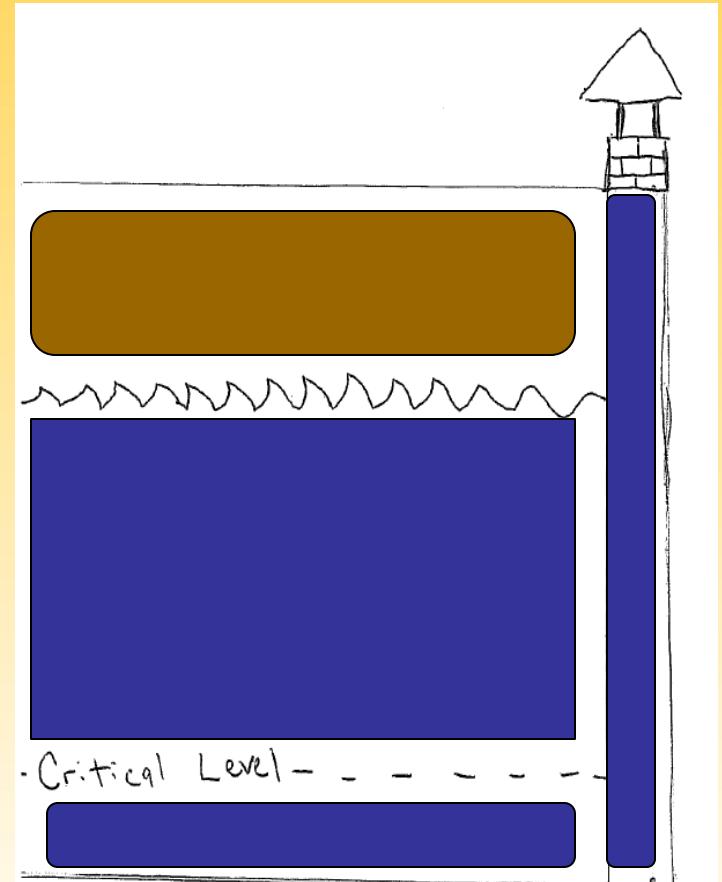
# Company Overview

- Northern Star Company is a division of Michael Foods
- Produce potato products for retail and food service needs



# Motivations for Change

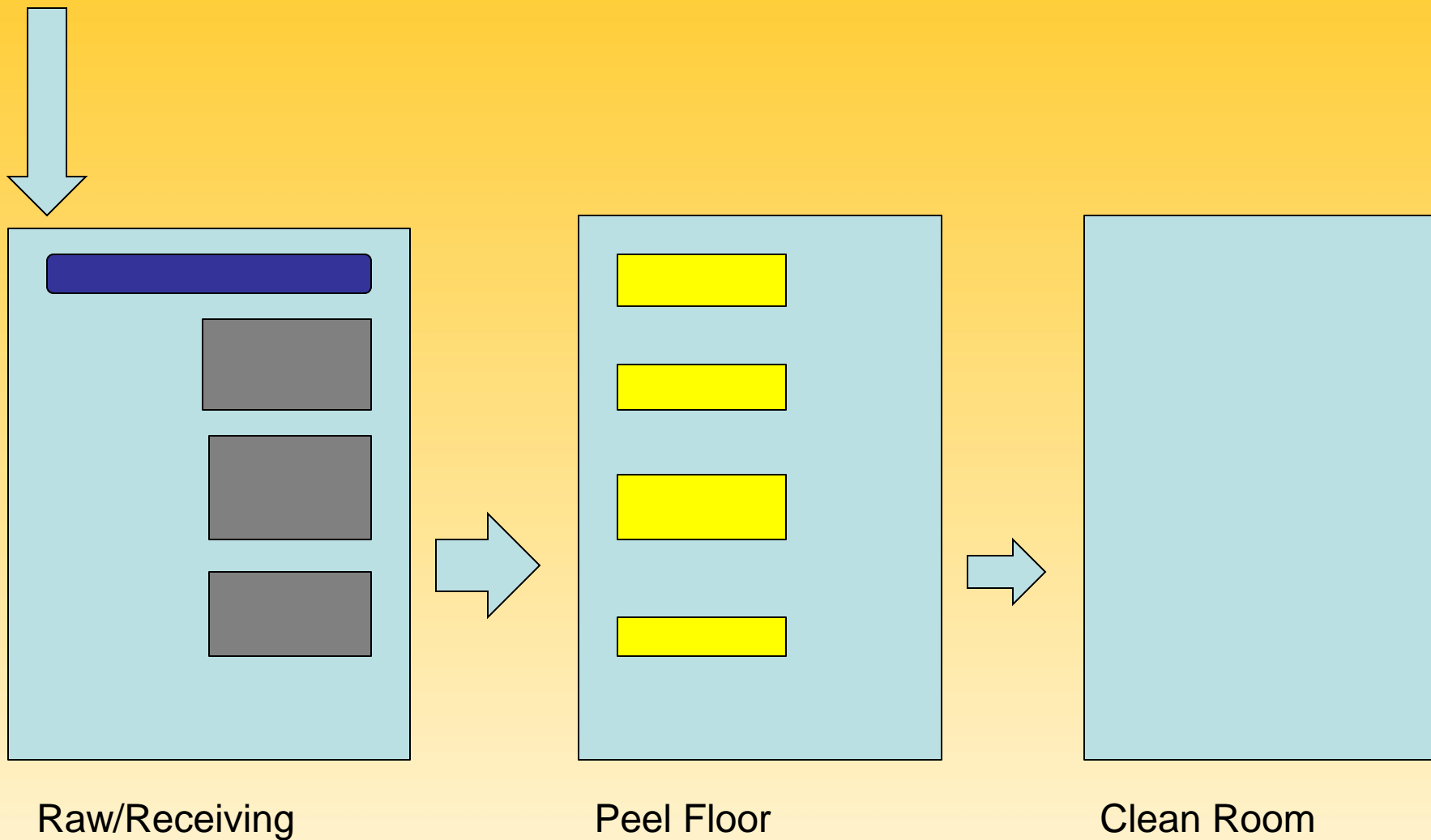
- Water usage has been on the rise
- Limited by well usage
  - Cannot expand without cutting current usage
  - Efficiency declines
- Not deplete aquifers for surrounding area



# Overview

- While water is used all over the plant, certain processes require much more than others
  - Raw/Receiving
  - Peel Floor
  - Clean Room





# Thought Process

- Steps:
  - Visual Check
  - Operation manual
  - Operators/Supervisors





# Potato Washer

- Constantly overflowing
- The water level was set at 28 inches
- Found process to be efficient at 26 inches



# Reverse Osmosis Reject Water Reuse

- Facility houses an RO system to purify water for the boiler feed
- The reject water is collected and used for the potato washer and a peeler exhaust tank



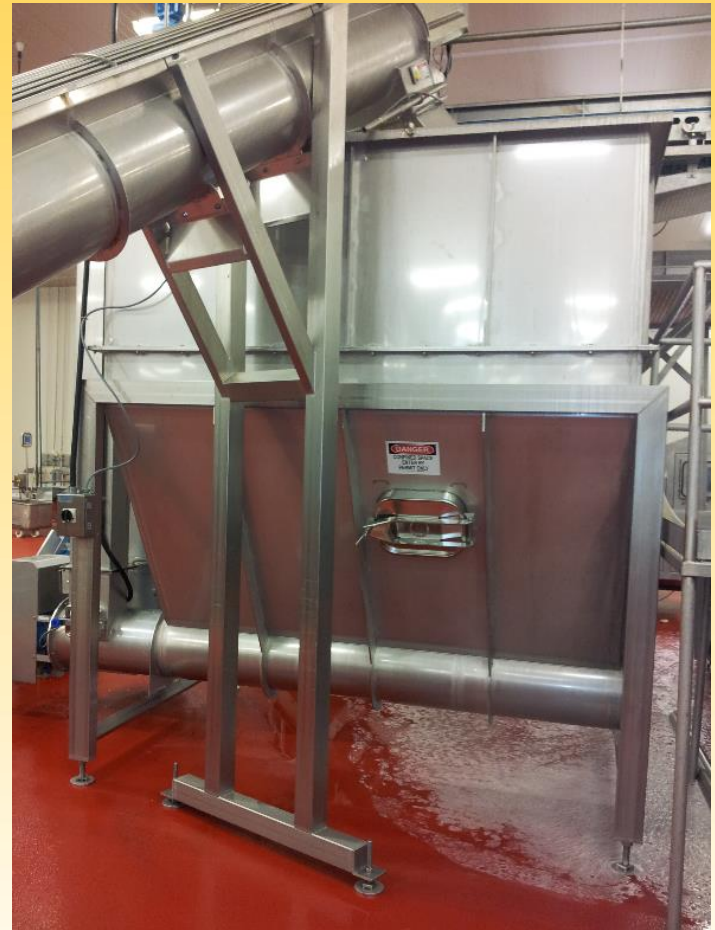
# Pump Tank Auto Fill Valves

- Currently have manually operated fill valves
- Tanks constantly overflow
- Valve runs at close to 50 gallons per minute
- Potential savings of 4.2 million gallons



# Surge Bin Fill Levels

- The bins do not need to be filled entirely since potatoes displace the water
- There should be an optimal level to fill the bins based on poundage entering



# Peeler Exhaust

- Used to run 40-50 seconds
- The spray time was found to be more effective at 30 seconds





# Reusing Scrubber Water

- This capital project would need:
  - Tested screening device
  - Grinder pump
  - Water storage tank
  - Centrifugal pump
  - Piping
- Main objective: Turn water intensive process into a semi-closed loop system



# Basket Washer

- Constantly overflowing
- Measured rate of over 20 gallons per minute if the valve is open wide
- Missing float
- Operator must keep valve cracked



# Replaced Solenoids

- Peeler 2 exhaust tank
- Helisieve in waste room





# Summary

Recommendation	Water Saved (per year)	Net savings (per year)	Status
Repair broken solenoids	1.4 million gallons	\$6,000	Completed
Replace basket washer float	6.7 million gallons	\$29,000	Completed
Reduce peeler spray time	93,000 gallons	\$400	Completed
Reduce potato washer water level	2.8 million gallons	\$12,000	Completed
Reuse RO reject water	5.25 million gallons	\$22,600	Completed

# Summary

Recommendation	Water Saved (per year)	Net savings (per year)	Status
Reuse scrubber water	8.25 million gallons per scrubber	\$35,000 per scrubber	Recommended
Install auto fill valves on pump tanks	4.2 million gallons	\$18,000	Recommended
Optimize surge bin water level	1.9 million gallons	\$8,300	Recommended

# Totals

	Water Saved (per year)	Net savings (per year)
Water Conservation (Completed)	16.25 million gallons	\$70,000
Water Conservation (Recommended)	14.35 million gallons	\$62,000
Total	30.6 million gallons	\$132,000

# Personal Benefits

- Hands on experience in an industry
- Working with all levels of employees
- Being in charge of a project
- Making a difference

# Questions?

