




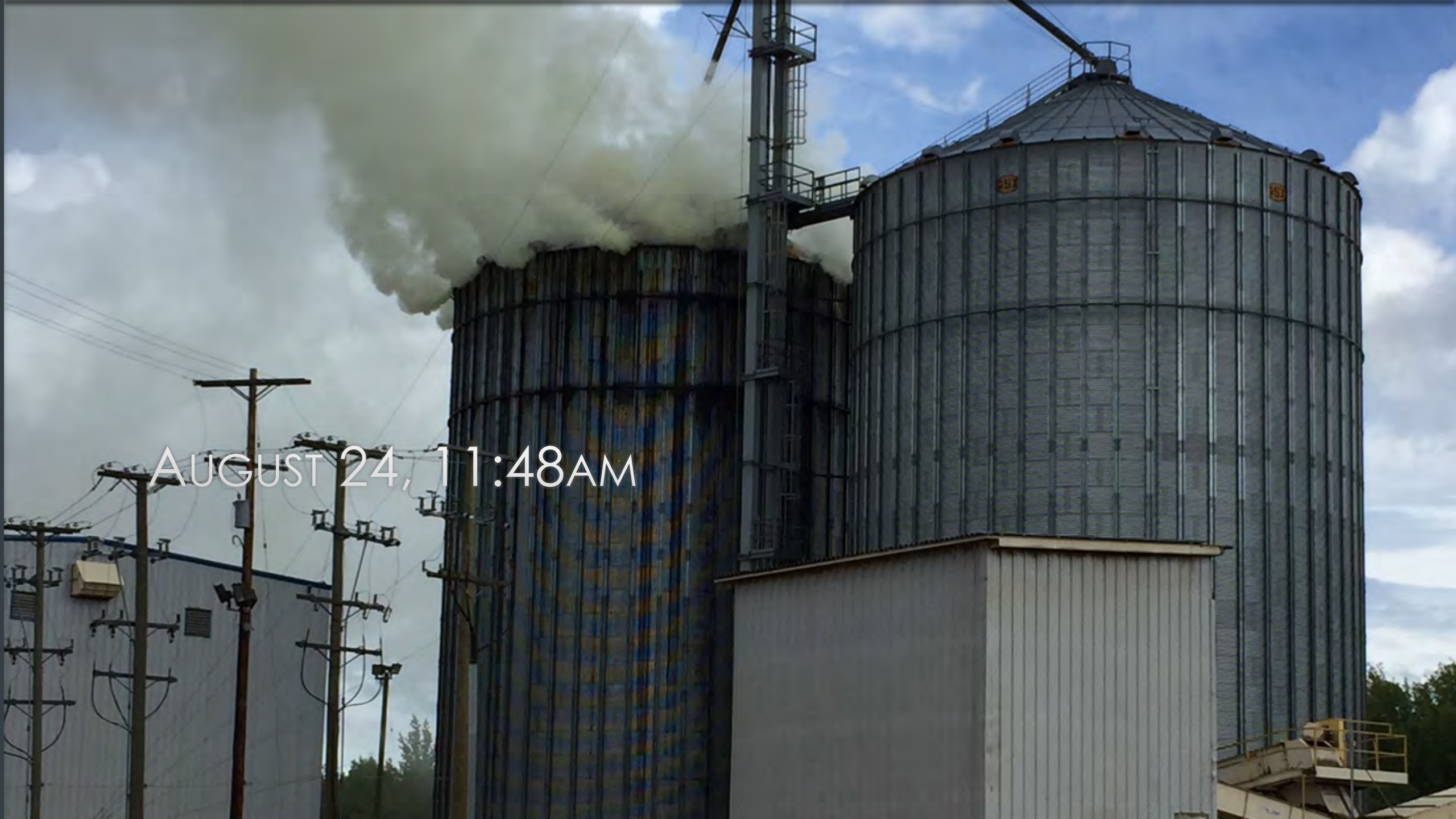
Pacific BioEnergy

SILO SMOULDER

WPAC OTTAWA

The image shows two large, cylindrical industrial silos made of corrugated metal. They are situated outdoors under a cloudy sky. A tall metal structure with ladders and walkways is positioned between the two silos. In the foreground, there are utility poles with power lines. The date and time 'AUGUST 24, 6:52AM' are overlaid in white text on the left side of the image.

AUGUST 24, 6:52AM



AUGUST 24, 11:48AM

SAFETY MEETING EVERY SHIFT  
ZERO INCIDENTS OVER EVENT



# TRAILER MOUNTED VAPORIZER UNIT TMVU





11-2-3

23

EXTINGUISH  
KEEP CLEAR

P 17 0068  
VK 17 0068

2709

PRAXAIR





NITROGEN TRUCKS SHIPPED  
FROM EDMONTON STAGED  
FOR CONTINUOUS SUPPLY

# NITROGEN DELIVERY SYSTEM TO 4 LANCES





# GOOD MATERIAL



# WATERING MATERIAL WHILE LOADING TO CONTROL DUST AND EMBERS





# UNLOADING PRODUCT ON ASPHALT



# SPREAD AND SPRAY



# REMOVAL OF SMOULDERING MATERIAL WITH NITROGEN LANCE



# SMOULDERING MATERIAL IN CONVEYOR MELTING BELT



# SMOULDERING MATERIAL IN BUCKET ELEVATOR



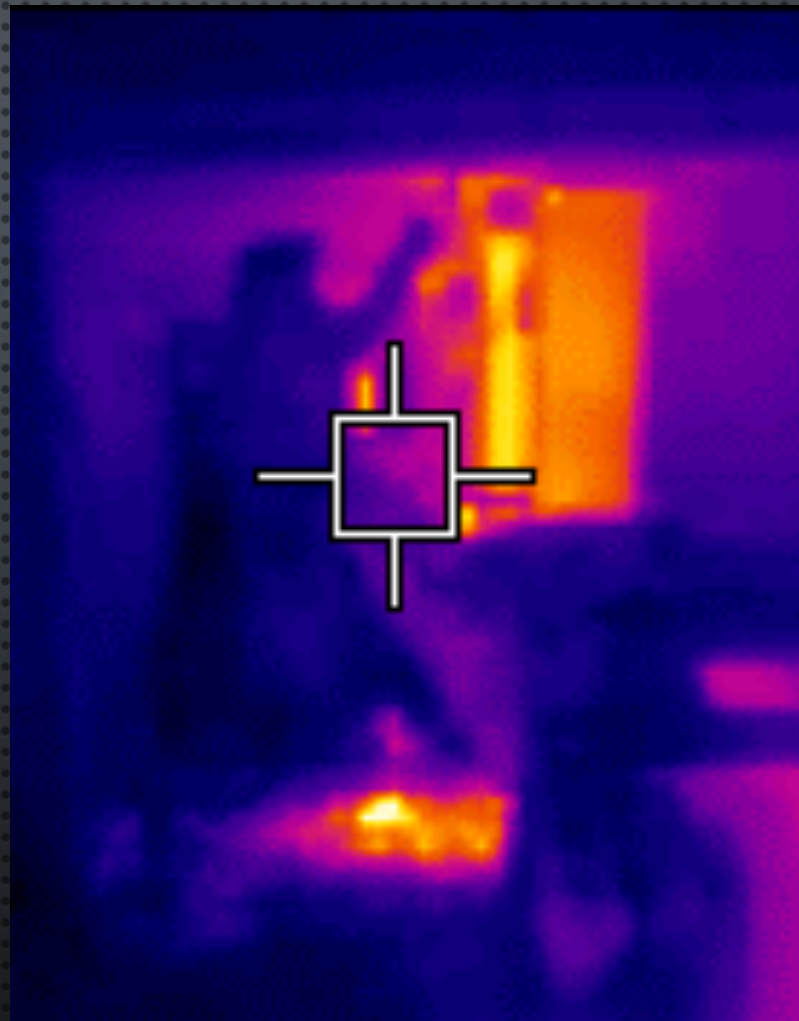
# HOT PRODUCT LOADED INTO TRUCK BEING SPRAYED





MELTED CONVEYOR BELT

# THERMAL IMAGE OF EXTRACTION





INTERRUPTION IN REMOVAL  
FOR GATE MAINTENANCE  
AND BELT REPLACEMENT

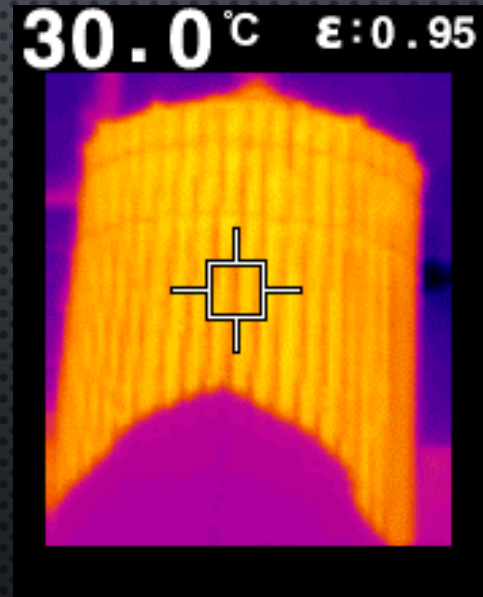
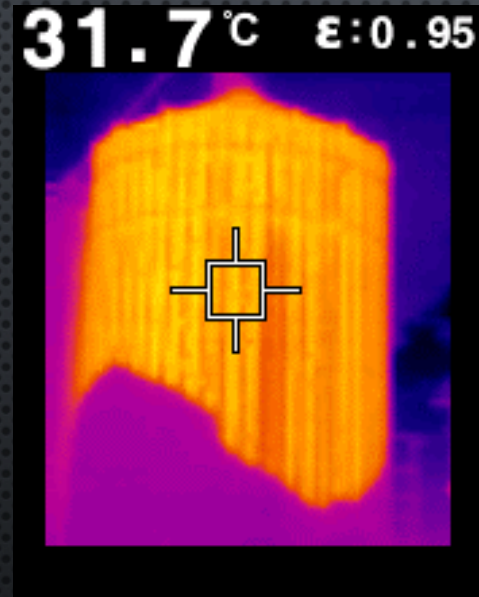
SHOP VAC ATTACHED TO  
DELUGE LINE TO MONITOR  
OXYGEN LEVEL IN HEADSPACE  
WITH AIR MONITOR



CLASS A FOAM MIXED IN  
TOTES AND PUMPED INTO  
HEADSPACE VIA DELUGE LINE




# THERMAL IMAGES USED TO DETERMINE REMAINING MATERIAL IN SILO



FIRE DEPARTMENT RELEASED FROM SITE  
MORNING OF AUGUST 31 ONCE THEY  
COULD NO LONGER REMOVE ANY  
PRODUCT FROM THE GATES





SILO DELUGED WITH WATER TO  
CONTROL ONGOING SMOULDERING  
AND ACCESS HATCHES CUT TO  
REMOVE REMAINING MATERIAL

# GOOD FLOW OF MATERIAL PRIOR TO SATURATION



POST HOLE AUGER  
ATTACHMENT FOR BOBCAT





POST HOLE AUGER BIT WITH  
ADDITIONAL 9" AUGER  
SECTIONS FOR 20 FT OF REACH



BOBCAT WITH AUGER  
ATTACHMENT DUBBED  
"THE PENETRATOR"

# THE PENETRATOR IN ACTION





- RESUMED FULL OPERATIONS ON SEPTEMBER 7 WITH **ZERO** SAFETY INCIDENTS.
- DAMAGE WAS ISOLATED TO THE SILO AND RELATED CONVEYORS USED FOR EXTRACTION OF THE MATERIAL.

# DEMOLITION OF DAMAGED SILO DURING OPERATIONS



# LESSONS LEARNED

- EVALUATE AND INSTALL PROTECTION INFRASTRUCTURE **BEFORE** YOU NEED IT
- DEVELOP AN EXTRACTION PLAN
- DON'T PANIC
  - THE PELLETS ARE SMOULDERING - NOT OF FIRE
- LIMIT THE AIR EXCHANGE WITHIN THE VESSEL WHILE STILL ALLOWING HEAT TO ESCAPE
- DO **NOT** USE WATER!
- INERT THE AIRSPACE WITHIN THE VESSEL WITH NITROGEN GAS
- EXTRACT THE SMOULDERING MATERIAL AND FULLY EXTINGUISH ONCE REMOVED



THANK YOU