

GATEWAY TO SCIENCE ETHANOL EXHIBIT

Status Report: Contract R-027-036

Provided Oct. 30, 2017

For the period of July 1-Sept. 30, 2017

Provided by the North Dakota Ethanol Council

Objectives

The objectives of this project are: 1) to increase the long-term use of ethanol in North Dakota by educating students, parents and educators in the region on the benefits of ethanol to the economy, environment and energy independence; and 2) to ensure the future of the ethanol industry workforce by engaging students, parents and educators in the lifecycle of ethanol production, specifically the scientific process of converting an agricultural product, which is a growing source of sustainable energy, into high-value co-products, including ethanol and distillers grains.

In addition to the North Dakota Ethanol Council (NDEC), partners in the program are Gateway to Science (GTS) and Science Museum of Minnesota (SMM), as well as ethanol industry stakeholders including: CTE Global Inc, Dupont, Gaviion, Growth Energy, Lallemand and New Age Cryo.

The strategy that will be implemented to meet the objectives is the installation of a hands-on, interactive, ethanol-specific exhibit to be utilized as a pilot at the current facility and then permanently installed at the new GTS facility in Bismarck, ND, which is scheduled to open in 2018.

Strategy Progress

See attachment.

The ethanol exhibit spent this reporting period at the Science Museum of Minnesota (SMM) in Saint Paul. Attached are several pdfs documenting the work performed by SMM:

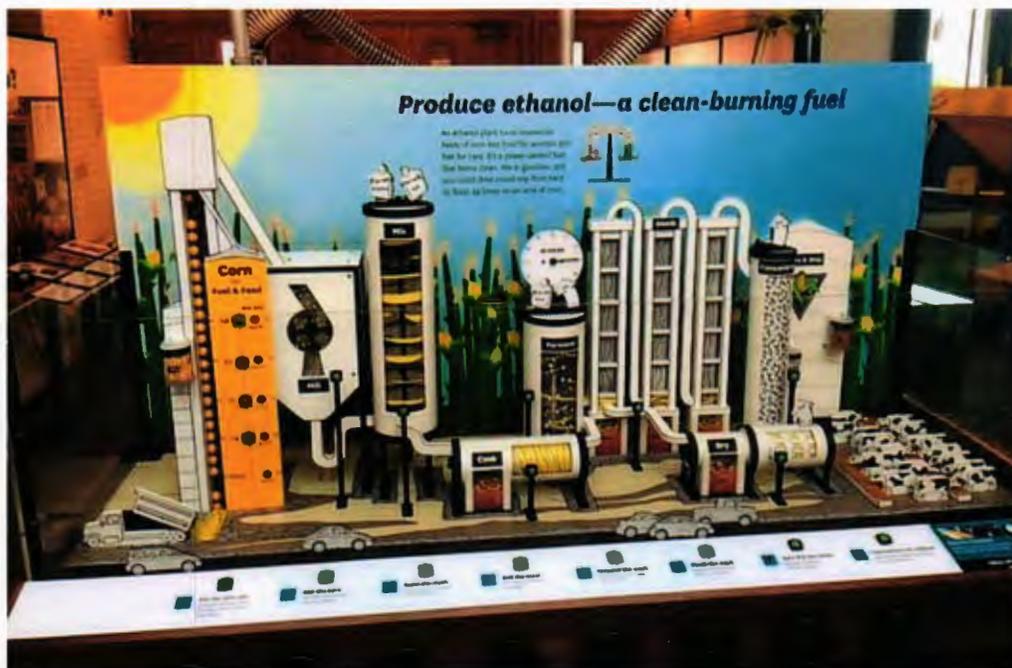
- Work plan and timeline for taking the exhibit from prototype to pilot
- Diagram of the exhibit furniture
- Drafts of the exhibit graphics

The final pilot exhibit was delivered to Gateway to Science on October 18, 2017. Science center staff will now begin evaluation of the pilot exhibit.

Expenses for this reporting period:

Expense	Detail	Amount
Gateway to Science staff time for pilot exhibit development – Chris Dorfschmidt, Gallery Supervisor	75 hours at \$25/hour	\$1,875.00
Gateway to Science staff time for pilot exhibit development – Beth Demke, Executive Director	25 hours at \$50/hour	\$1,250.00
SMM invoice – pilot exhibit fabrication (payment 1 of 3)		\$14,076.00
SMM invoice – pilot exhibit fabrication (payment 2 of 3)		\$14,076.00

**Please note: We anticipate spending more than originally projected on the pilot exhibit and less than originally projected on the permanent exhibit fabrication and install. While the percentage for each stage of the project may shift, the total expenses will remain \$110,000 (\$100,000 cash, \$10,000 in-kind).*



Gateway to Science

Work plan and Timeline for finalizing Ethanol pilot exhibit

July 20, 2017

Task	Deadline
Assess condition of existing mechanisms	08/11/17
Review/ recommend revisions with Gateway based on mechanical assessment	08/18/17
Revise copy as needed	09/15/17
Determine electronics, lighting, and sound effects	09/15/17
Finalize furniture design	09/15/17
Graphics to production	09/29/17
Build furniture, install mechanisms and electronics, and graphic production and installation	10/13/17
Delivery to Gateway (will narrow this based on shipping availability and price.)	Between 10/20/17 and 10/24/17

Acrylic "sneeze shield"
on 3 sides

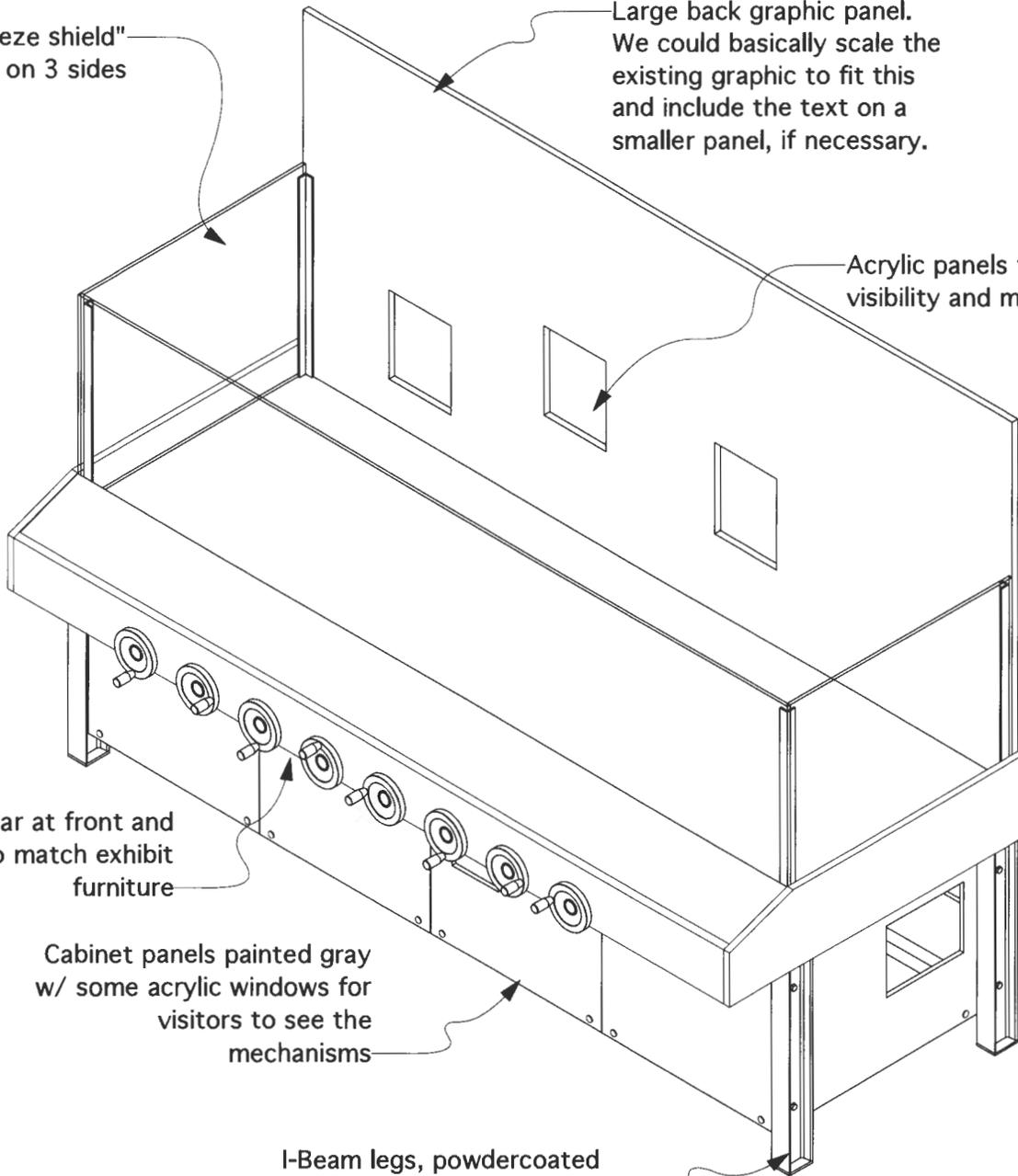
Large back graphic panel.
We could basically scale the
existing graphic to fit this
and include the text on a
smaller panel, if necessary.

Acrylic panels for mechanism
visibility and maintenance

Walnut collar at front and
sides to match exhibit
furniture

Cabinet panels painted gray
w/ some acrylic windows for
visitors to see the
mechanisms

I-Beam legs, powdercoated
teal per design plan



Produce ethanol, a clean-burning fuel

An ethanol plant turns renewable fields of corn into food for animals and fuel for cars. It's a power-packed fuel that burns clean. Mix in gasoline, and you could drive round-trip from here to Texas 24 times on an acre of corn.



4000 GA 22 Ethanol Plant, NDDO
80% + 6
2nd cutback, 18% non-gas crops

1 Fill the corn silo
Increase the time that
the cars race and the
cows feed.

2 Mill the corn
Hammer the kernels
into tiny pieces.

3 Make the mash
Transform corn starch
into thick slurry.

4 Boil the mash
Turn the corn starch
into sugar.

5 Ferment the mash
Convert the corn sugar
into alcohol.

6 Distill the mash
Separate the alcohol,
solids, and water.

7 Spin-dry the solids
Recover nutritious
distillers grains.

8 Concentrate the ethanol
Remove the remaining water for
200-proof ethanol.

Feed the livestock
Distillers grains from North Dakota
feed livestock all over the world.

Fuel the cars
AVANGAR whiskeys and all cars and light
trucks can be powered by 100% corn ethanol.
AVANGAR whiskeys are 100% corn ethanol.

When all the process lights are green,
push the flashing button.