Double Green Bridge

NW INNOVATION WORKS

GAS TO METHANOL FACILITY AT THE PORT OF ST. HELENS

February 2016

JOBS AND ECONOMIC BENEFITS

- Northwest Innovation Works (NWIW) will invest at least $1.8 billion in its facility at an 83-acre site at Port Westward to convert 10,000 tons of natural gas to methanol every day. The methanol will be exported by ship to Asia for use as feedstock for the production of olefins.
- The facility will support up to 1,000 construction jobs over a multi-year construction period.
- Approximately 200 long-term, family-wage jobs will be created to support plant operations.

METHANOL AND OLEFINS

- Methanol is a light and colorless liquid that evaporates in air.
- Methanol is water soluble, biodegradable and non-carcinogenic.
- Olefins are key to making many products used every day in the United States and around the world, including medical supplies, safety and industrial equipment, smartphones, kayaks and clothing.

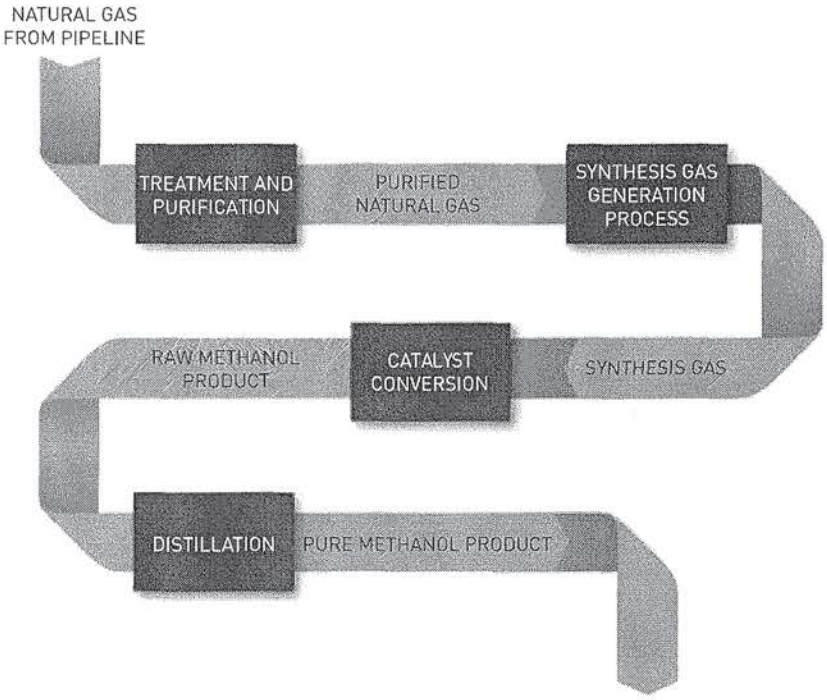
REDUCED EMISSIONS AND CLEANER PRODUCTION

- Current state-of-the-art facilities reduce emissions by up to 70 percent compared to coal. NWIW takes a next-generation step with ultra-low emission (ULE) technology that will reduce emissions an additional 75 percent.
- For the first time, ULE technology will be used at industrial scale to further reduce emissions.
- Emission data and associated air permits will be developed as part of the regulatory process.

WATER AND ELECTRICITY USE

- All of the projected water use falls within existing water rights for the site. Water will be used in both the production and cooling processes.
  - Most of the water will be used for cooling during the reforming process, with 81 percent of the water returned to the atmosphere as water vapor.
  - Process wastewater will be treated and reused in the plant's processes and not directly discharged into the environment. Treated cooling water will be discharged to meet current permit requirements and environmental regulations.
- Specific water intake requirements have not yet been determined for this facility. Intake is likely to be around 3,600 gallons per minute, which is a small percent of the river's flow and well within the Port's water rights.
- Estimated maximum electrical load is up to 250 megawatts (MW), with average use of 200 MW.

THE METHANOL PRODUCTION PROCESS



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2.6.1.3 Components Unique to the ULE Alternative

Power Generation Facility

The ULE Alternative would meet its electric power demands using a combination of grid electric power and on-site power generation. As discussed below, it is expected that new power lines would be run on existing poles to the project site and a new substation would be constructed within the project site. The ULE Alternative would have greater demand for electric power than the CR Alternative (200 megawatts compared to 30 megawatts), so the proposed project with the ULE Alternative would need to supplement the grid electric power.

The ULE Alternative would supplement grid electric power with an on-site 125-megawatt power generation facility. The power generation facility would consist of two natural gas-fired combustion turbines and one steam turbine. Natural gas mixed with air would combust in the gas turbine to generate electricity, and the exhaust gas from each combustion turbine would be used to generate high pressure steam to produce power through a steam turbine. The exhaust stacks would be the tallest element of the power generation facility and would be approximately 90 feet tall. If in the future, Cowlitz County PUD constructs transmission capacity adequate to supply all of the power needs for the ULE Alternative, the on-site power generation facility may not be necessary.

Waste heat from the power generation facility would be managed through cooling towers. Under the ULE Alternative, one cooling tower with two cells would be installed for the power generation facility. This tower would be located adjacent to the cooling towers installed for the methanol production process as discussed below.

Methanol Production Lines

The proposed project with either of the Technology Alternatives would include two methanol production lines. The size, layout, and appearance of the methanol production lines would vary slightly for the CR Alternative and the ULE Alternative. The GHR used in the ULE Alternative would be of similar height to the SMR, but has a smaller footprint and would look like a large vessel or tank. The production lines would occupy approximately 14 acres of the project site with the ULE Alternative. **Figure 2-8** shows an elevation of a methanol production line under the ULE Alternative.

2.6.1.4 Components Common to both Technology Alternatives

The proposed project, with either of the Technology Alternatives, would result in the development of a methanol manufacturing facility that would produce up to 10,000 tonnes[2] of methanol per day when operating at full capacity. The anticipated yearly production at full capacity with both production lines would be approximately 3.6 million tonnes. The methanol would be stored on site for transfer to shipping vessels at the marine terminal.

With either Technology Alternatives, the proposed methanol manufacturing facility would consist of the following major components.

[2] One tonne (approximately 2,204 pounds) is equivalent to approximately 333 U.S. gallons.

ATTACHMENT Y