

CASE STUDY / **LIGNIN PLANT DESIGN AND CONSTRUCTION**

TURNING WASTE INTO A RENEWABLE CHEMICAL PROFIT

To capitalize on an untapped revenue stream, a joint venture sought installation of a facility to produce, store and distribute high-performance lignin products from renewable raw materials.

Overcoming site challenges, we provided front-end planning and EPC services to deliver an efficient plant on time and under budget.



A JOINT VENTURE GENERATES PROFIT BY REUSING AN EXISTING WASTE STREAM

A new facility produces high-performance lignin products for a wide range of industrial and commercial uses.

PROJECT STATS

CLIENT

LignoTech Florida LLC

LOCATION

Fernandina Beach, Florida

TOTAL PROJECT COST

\$84 million

COMPLETION DATE

2018

100K

METRIC TONS OF
LIGNOSULFONATE PRODUCTS
PRODUCED ANNUALLY

CHALLENGE

Armed with technology capable of turning a waste stream into commercial products, Borregaard and its U.S. subsidiary LignoTech entered into a joint venture with Rayonier Advanced Materials (RYAM) called LignoTech Florida. This agreement would allow the establishment of a new lignosulfonates plant adjacent to RYAM's existing softwood cellulose specialties mill in Fernandina Beach, Florida. To deliver a facility that uses the waste lignin liquor stream from RYAM's mill as feedstock to manufacture a variety of lignin products, the client turned to our team for front-end planning and engineer-procure-construct (EPC) services.

SOLUTION

We began the project with front-ending planning to verify the client's estimated project costs and identify potential issues. This early dedication to engineering evaluation and constructability analysis helped bring focus to critical issues on the project, such as the project site itself. The available land was on a narrow, marshy peninsula surrounded by water and protected wetlands. Therefore, our team conducted environmental studies and provided detailed design and a construction plan to avoid any disturbances to the fragile lands. In addition, the soil of the shoreline

landmass offered no bearing strength, so we designed driven metal piers to support the entire installation with little to no reliance on the soil.

With site concerns addressed early in project development, detailed project scope definition could proceed. Borregaard's proprietary lignin processing technology was incorporated into the overall design and detailed work package planning was developed. A critical element in this planning was the Interactive Project Planning Meeting (IPPM) with engineering, procurement and construction personnel establishing the project timeline and interdependencies. From this session, a comprehensive EPC project execution plan was developed, integrating engineering deliverables timelines by work package, equipment procurement plan with lead times and deliveries, subcontract plan, field pre-assembly work plan, shop fabrication opportunities and overall construction sequencing to establish a sound overall project schedule and cashflow plan.

Once a solid plan was established, we provided full EPC services, including civil site preparation and construction packages, smart Piping and Instrumentation Diagrams (P&ID), and 3D models for generation of structural, mechanical, electrical, instrumentation and other project drawings.



Full technical specifications were also developed in support of procurement activities. These activities included a complete bid process to solicit pricing, and to evaluate and condition condition bids and award packages in support of the construction schedule. This required sourcing all shop-fabricated equipment, field-erected storage tanks, shop-fabricated pipe, structural steel, instrumentation, electrical equipment and pre-engineered metal buildings.

Major packages included large vendor systems such as ammonia stripper, reactor, spray dryer, pneumatic conveying, and truck and rail loading racks.

Dedication to the early assessment of engineering progress and construction planning helped bring focus to critical execution issues for the project, while project planning and team collaboration offered efficient delivery.

RESULTS

The 80,000-square-foot lignin plant was brought online to process, mix, package, store and distribute 100,000 metric tons of high-performance lignin products in 2018. Completed on time and under budget, the facility provides environmentally friendly alternatives to fossil fuel-based products used in construction, agriculture and industrial applications — all generated from renewable raw materials.



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