CASE STUDY
FILTER PRESS DOUBLES COAL PRODUCTION

The Issue
A 2.5 meter belt press became the production bottleneck for a small “bank reclaim” anthracite coal operation in rural Pennsylvania. At this facility, the coal is recovered using a dense medium process a spiral separation system. After separation, the minus 325 refuse material reports to a clarifier where a coagulant and flocculent are added. This slurry was then dewatered by the belt press. Moisture on the belt press cake was excessive and ranged from 38 to 43% depending upon slurry consistency and particle size distribution.

The Solution
Tons Per Hours (TPH) was contacted in early 2015 and asked to provide a solution to allow the plant to operate regardless of raw feed characteristics, increase the production volume and the rate of dewatering. A high pressure, 1500 by 1500 millimeter (mm) membrane filter press with 19 plates was installed.

This press is manufactured by world press leader Jingjin Environmental with exclusive distribution by TPH. It is completely automated utilizing Allen Bradley® Programmable Logic Controller (PLC), with a touch screen (PanelView®) control, and Variable Frequency Drives (VFDs).

Results
Not only did the plate press reduce the polymer consumption by 80%, but also significantly increased the production of coal since the filter press was able to prevent the clarifier from filling up with material during production hours.

Traditionally, belt presses use a significant quantity of polymer to create a slurry consistency that is “stiff” enough to prevent loss within the unconfined compression area of the belt press. With a TPH filter press, however, the system is sealed and slurry consistency is inconsequential to the success of the operation. No more “squeeze out” and mess to clean!

An added benefit of this press is that much less anionic and cationic polymer is required — and the resulting cake dries much faster when exposed to sunshine. In this case, cake moisture is about 20% from the TPH press and can reach 10% after two to three weeks in the sun. This is because the cake has less residual polymer and the water is able to evaporate at a much faster rate. In some markets, this can be sold for about $3 to $5 per ton.

The TPH system provides crystal clear filtrate (water) for re-use in the plant and dry, stackable/manageable, waste solids. This is done with minimal operator involvement. Because the operator was able to increase his production and greatly reduce his polymer consumption, a reasonable “payback” period was achieved.
Quality liquid-solid separation is critical to business operation due to the modern focus on natural resource stewardship and water conservation, environmental restrictions, and water resource management. Tons Per Hour, Inc. (TPH) is your one-stop solution for all industrial liquid-solid separation needs with offices in North and Latin Americas. Tons Per Hour proudly serves these industries:

- Sand and Gravel Operations
- Industrial Minerals
- Municipal Waste Water Treatment
- Ready Mix Concrete
- Fly Ash Dewatering and Impoundment
- Oil, Gas and Coal
- Fracturing Sand & Proppants

Deploying Tons Per Hour solutions yields manageable, dry solid stackable cake and clear reusable water. Twenty five years of industry expertise ensure effective solutions to common problems and customized solutions alike. Slurry impoundments that are full or nearing capacity are effectively rendered obsolete by converting slurry water into clean, reusable process water and dry stackable cake.

Our partner, Jingjin Environmental Protection, is the world’s largest manufacturer of filter presses. With them, we have developed proprietary operations algorithms that yield results unmatched in the industry. Our presses and plates are manufactured to ISO 9001 and ISO 14001 standards, and meet the Occupation Health and Safety Assessment Series specification (OHSAS 18001).

TPH and Jingjin offer the greatest selection of filter press designs of any other company in the world. The range includes presses with capacities from 1 cubic foot and up to 30 cubic yards of solids per cycle. Multiple cycles per hour, determined by feed material specification, are achieved by the quick opening design.

TPH offers stationary and mobile system solutions for most liquid/solids separation needs as well as custom fabrication of tanks, thickeners, clarifiers, feeders, sumps, conveyors and other fabricated steel products. Each piece of TPH equipment is custom engineered and designed, and can be wet-stamped when required.

Quality liquid-solid separation begins with an initial consultation at your plant. After reviewing your existing operation, we will provide a comprehensive assessment, and then design and engineer a system specific to your needs. Working with our customers in tandem, we leverage the full range of products at our disposal: filter presses, belt presses, thickener-clarifiers, flocculent preparation, metering systems, pumps, dewatering screens, and a complete line of liquid-solid separation chemistry options.

TPH and Jingjin specialize in solid-liquid separation, tailings management and mine slurry systems.