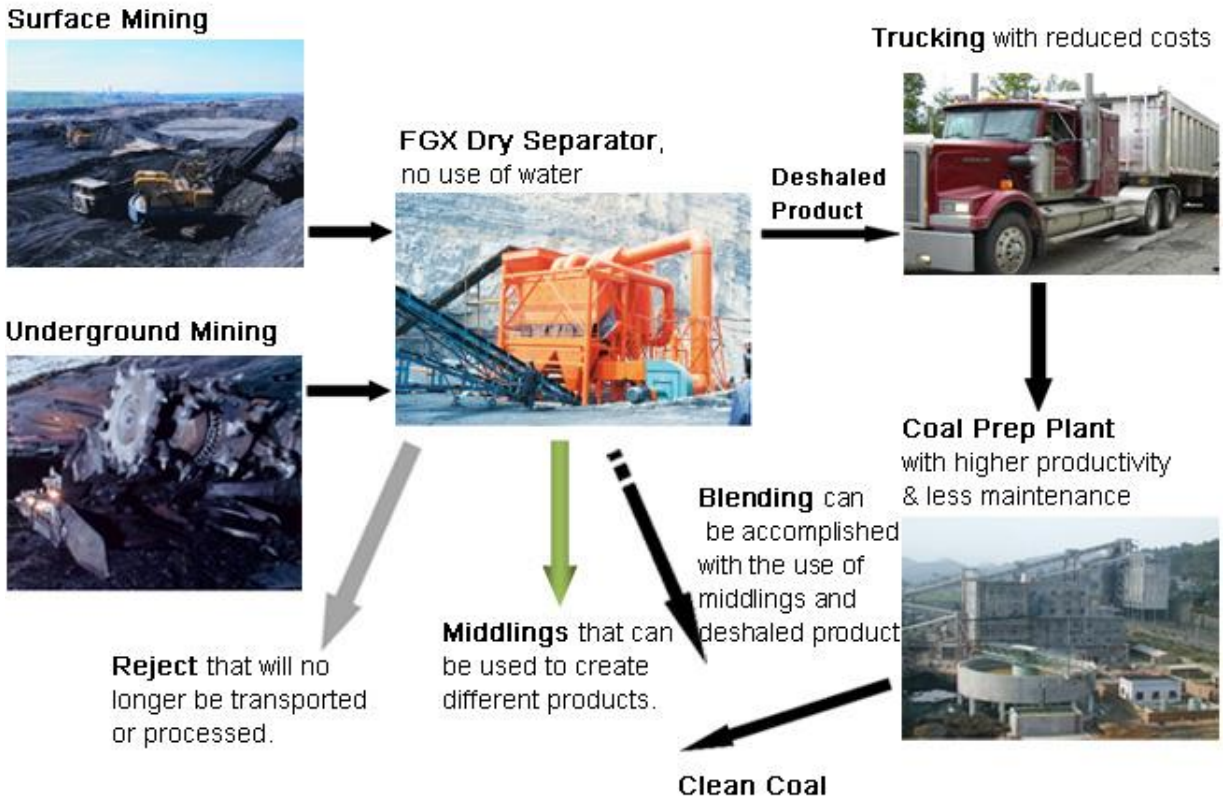


# FGX Dry Coal Separator

## Process Overview

The application of FGX dry coal separator can be schematically shown as follows,



The FGX separator typically generates three product streams, i.e., deshaled product, middlings and tailings. In each of the scenarios discussed above, coal blending can be done to maximize the economic benefits of an operation. Options of blending include blending FGX middlings with deshaled product, blending FGX deshaled product with prep plant clean coal, etc. For example, lignite is the lowest rank of coal with a high inherent moisture content and low heating value. Due to its unique geological characteristics, mineral matter in lignite is easily decomposed during wet preparation of lignite. This creates fine clay particles and usually deteriorates water treatment system of prep plant. The FGX technology offers a method for lignite coal processing which does not involve the use of water. The FGX dry coal processing technology has been successfully applied at several lignite coal mines and lignite heating value can be significantly improved after FGX beneficiation.

As is known, sulfur in coal exists in two forms including organic and inorganic. Organic sulfur is an integral part of coal matrix and cannot be removed by physical separation process. However inorganic sulfur, mostly pyritic sulfur, can be removed to varying extents by physical methods such as FGX separator. The average total sulfur reduction rate obtained in lignite coal tests was 34.8%, which equates to an average SO<sub>2</sub> reduction of 35.8%. Another finding is the reduction of mercury content of the FGX-treated lignite coal in which a high Hg reduction rate of 50% has been achieved.

## **Facility**

The information provided is based on a 1,000,000 ton/year facility located at the plant site using the bituminous coal quality as listed in Table X.

### *Utility Requirements*

Approximately 950 hp are required for a 1,000,000 ton/year (raw feed) facility.

### *Manpower Requirements*

The process will only require only one person per shift of operation, exclusive of coal handlers in the yard.

### *Estimated Pollutant Removals*

Sulfur reduction is estimated at over 60%, provided it exists in liberated pyritic form. Mercury reduction will be over 50% if it is in the high density section. The ash rejection rate will be over 90%, and the moisture can be reduced since the FGX process is completely dry.

### *Recovery*

In general, yield of clean coal averages about 90%. However, the recovery depends on the washability of the raw material to be treated. The FGX process is a proven technology on dry coal deshalting.

### *Higher Heating Value of Coal*

The heating value is again based on the washability characteristics of the coal; usually over 10,000 Btu/lb is not a big challenge.

### *Footprint Size*

The dimensions for the plant itself are only 100 ft x 50 ft x 30 ft. This does not include reject piles, etc.

### *Scale (size) Tested*

The FGX Septech process has been evaluated at commercial scale in plants operating from 10 tons/hr to 1,400 tons/hr.

## **Economics**

The capital equipment cost for the FGX Septech process is about \$1,200,000 for the million ton/year plant. The operating costs are about \$1,000,000/year resulting in a cost per ton of product between \$0.80 to \$1.20 per ton of raw feed.