



ENGINEERING AND CONSULTING DIVISION  
POWER PRODUCTION SERVICES  
WASTE COAL CFB PROJECTS  
DEVELOPMENT SERVICES

- Fuel/Limestone Sourcing (Locating & Estimating Quality, Ownership, Transport Modes)
- Fuel/Limestone Information Search (History, Estimated Tonnage & Quality)
- Fuel/Limestone Database (Preliminary Fuel Plan, Cost Estimates)
- Purchase/Lease Option Agreement (Agreement, Property, Pricing, Etc.)
- Exploration And Reserve Assessment (Mapping, Drilling, Sampling, Laboratory)
- Mining/Reclamation Plans (Blending, Stockpiling, Equipment, Transport, Reclamation, Costs)
- Fuel Plan And Costs (Pro-Forma, Discounted Cash Flow)
- Lender Certification
- Construction Development



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FUEL/LIMESTONE SOURCING

Miltech routinely assists CFB Project developers with locating suitable fuel and limestone reserves for planned projects.

These Miltech fuel and limestone sourcing efforts include locating the reserves, determining likely transportation routes, estimating (based on available information and field reconnaissance) the quality and quantity of the reserve, establishing reserve ownership and finally, providing preliminary estimates of the cost of delivering and burning the fuel and limestone.

Miltech's fuel and limestone sourcing reports to the client provide a locations map identifying all waste coal sites recommended for further consideration as well as a summary matrix tabulation of all recommended fuel reserves that lists the sites with all pertinent information in order of projected overall cost (\$/m Btu) to the project.

Miltech's fuel and limestone sourcing studies provide the basis for preliminary fuel and limestone planning as well as for future more detailed waste fuel evaluations.

Miltech has provided fuel and/or limestone sourcing studies for most of the bituminous waste-coal projects that are now in operation.



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FUEL/LIMESTONE INFORMATION SEARCH

Bituminous gob or anthracite culm usually make-up the major portion of the material that fuels the CFB. This gob or culm is found primarily in piles that were produced as refuse from coal producing operations.

Most of this waste-coal originates as reject from coal preparation plants.

Miltech's fuel information search aims at projecting the quantity and quality of this waste coal in each site and within a predetermined distance from the planned CFB site.

Conclusions regarding quantity, quality, haulage, ownership, costs, etc. are made based on:

- Site reconnaissance by Miltech engineers
- US Geological Survey topographic mapping
- Aerial photographs taken during pile deposition
- Available coal refuse production and/or quality data
- Available drilling and/or sampling testing
- Discussions with persons familiar with the operations that produced the waste-coal
- Other available historical information

A Miltech report is provided to the client for each coal refuse site involved and includes:

- General site history
- Projection of probable tonnage and quality
- Projection of likely cost to mine, deliver and burn
- Projection of likely reclamation costs
- Recommendation to consider for further study or for rejection

Also included in the fuels location study is a Miltech projection of the amount and quality of other "opportunity" waste fuels that may be available as reject or off-grade coal from present operations within economical transportation distances from the CFB plant.

Limestone sourcing studies normally aim at (1) defining and assessing limestone producing operations including production, reserves, quality, etc. and/or (2) assessing the potential of available limestone reserves as a guaranteed limestone supply to a project. Once identified the limestone source(s) are routinely analyzed for purity, reactivity, elemental makeup, etc. These analyses are used in our fuel plans in order to estimate limestone requirements needed to achieve a given sulfur capture for the fuels involved.



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FUEL/LIMESTONE DATABASE

Miltech's waste-coal and limestone supply information searches provide the basis for the development of preliminary fuel and limestone plans that are key to the financial viability of CFB projects.

Before a project moves from the preliminary stage to a full development effort, Miltech provides an assessment of the project as it relates to fuel and limestone availability and costs.

These Miltech assessments include a database of likely reserve strength, mining/reclamation costs, permissibility, haulage, etc. – all considered in a preliminary pro-forma analysis of the fuel aspects of the project. These assessments therefore provide a picture of the strengths and weaknesses of the fuel/limestone plans for the project and, as such, provide a basis for project modifications, etc. before the project consumes the higher costs necessary for full project development.

Also see:

- Pro-Forma Fuel, Ash Disposal, Limestone Plans and Cash Flow
- Fuel, Ash Disposal, Limestone Plans – Certification to Lenders



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**PURCHASE/LEASE OPTION AGREEMENTS**

As part of the fuel/limestone search studies, Miltech develops the site information that will be required in the site purchase or base agreements for any fuel or limestone site that may be desired for the project.

This site information includes name and address or owner; site location-borough, township, county, state; USGS map coordinates, etc.

Miltech routinely prepares example option and/or sales agreements for the client for each site that is of interest to the project.

These option/sales agreements provide the client an opportunity to explore in detail the site and allows the client a specific amount of time to exercise the option/sale agreement.

Included in these option/sales agreements are the prices to be paid for the site material along with other specific owner/client requirements involved.

Miltech's example agreements are easily modified to incorporate specific language required by the client or site owner.



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EXPLORATION AND RESERVE ASSESSMENT

Miltech's fuel exploration has confirmed the quantity and quality of over 400 million tons of reserves for:

- New CFB projects that combined are now producing over 700 Mw
- Existing CFB projects totaling nearly 300 Mw that required additional fuel reserves after the project was operating
- CFB projects that were investigated but not yet moved to fruition

The Miltech fuel exploration work includes borehole drilling and bulk sampling, land surveys, mapping, laboratory analyses, etc. that are needed to satisfy the financing requirements of a project.

The Miltech limestone exploration usually involves assessing the production of operating limestone producers. In some cases where new reserves are involved Miltech carries out a limestone drilling and sampling program in cooperation with the owner of the limestone reserve.

Also see:

- Fuel Sampling and Analyses
- Property Surveying
- Topographic Surveying and Mapping



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MINING/RECLAMATION PLANS

Miltech's work with CFB clients involves development, and for some, implementation of total mining/preparation/reclamation plans.

Some key results of Miltech's mining and reclamation planning for clients include:

- For one CFB project Miltech's work involved development and implementation of the total mining/preparation/reclamation plans including processing system designs, mine plans, transport costs and reclamation designs.
- At three other CFB projects the original fuel and limestone plans that were developed by others were modified to improve efficiency after the projects were put into operation. During subsequent years, Miltech worked continually with each of these projects to improve both the mining/reclamation and the materials handling/preparation plant operation.
- Miltech's mining plans for CFB projects have also included stockpile and conveyance plans, mobile mining equipment selection, screens, crushers, etc. as well as wet preparation systems.
- Miltech's use of sophisticated computer technology for data handling, mapping and design along with engineering expertise have provided optimizations that have led to modifications of existing waste coal recovery systems.
- Miltech pro-forma cost analyses have been used to assess costs of all phases of the fuel and limestone plan including mining, transportation, ash reclamation and fuel utilization.

See also:

- Pro Forma Fuel, Ash Disposal, Limestone Plans and Cash Flow
- Fuel, Ash Disposal, Limestone Plans and Cash Flow



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FUEL PLAN AND COSTS

On the basis of the technical, operational and cost studies performed during the waste coal project development, Miltech provides a pro forma fuel, ash disposal, limestone plan with cost estimates for the projected life of the project.

Included in a typical pro forma plan are:

- Fuel and Ash Assumptions
  - Includes fuel and ash payloads, trucking or other haulage rates, ash plus reject moisture, haulage days available
- Raw Material Costs
  - Includes fuel mining, royalties, haulage, reclamation and delivered limestone
- Project Assumptions
  - Includes gross generation, heat rate capacity factor, total heat required, calcium/sulfur ratio, limestone percent CaCO<sub>3</sub>, fuel moisture and delivered limestone cost
- Fuel and Fuel Quality
  - Includes available reserve tons and percent moisture, ash, sulfur and heating value of each fuel source

For each year of the project the plan provides the following information for each fuel source involved.

- Fuel tonnage burned
- Yearly burn (BTU/Year)
- Fuel quality
- Ash plus fuel reject tonnage
- Limestone required

The typical Pro Forma Cash Flow includes; for each fuel source, the yearly cost for:

- Fuel Mining
- Fuel and Ash Transportation
- Limestone
- Ash Disposal
- Costs per million BTU/lb

These Pro Forma evaluations are used to assess the viability of the project and provide the basis for final project design.



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LENDER CERTIFICATION

Miltech's fuel, ash disposal and limestone plans including pro forma and cash flow analyses support customers during and after project financing through interface with lending institutions involved.

Miltech's certifications have satisfied the financing requirements for two Pennsylvania greenfield CFB projects and one re-powering.

Other operating CFB projects in Pennsylvania, West Virginia and Utah have used Miltech's fuel, ash disposal and limestone related assessments to satisfy financial requirements where the certified plans were optimized by Miltech.

Miltech's experience with CFB project financing requirements ensures that project development is undertaken from project conception in a manner that will provide the best opportunity to acquire investors and long term financing.

See also:

- Pro Forma Fuel, Ash Disposal, Limestone Plans and Cash Flow
- Mining/Reclamation Plans



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CONSTRUCTION DEVELOPMENT

Miltech routinely provides fuel and ash disposal site construction services once a project is financed and moving to production

Examples of Miltech's site development are:

- In the early 1990's Miltech completed all site preparation work, including excavation and construction of site roads, erosion and sedimentation control for three coal-refuse sites that supply fuels to two CFB projects located in Pennsylvania.
- Miltech completed all site preparation work including acid water drainage treatment facility, mine section development, set up and screening of power plant fuel and completion of site development construction work for a beneficial use ash disposal site located in Pennsylvania.
- Miltech designed and constructed erosion and sedimentation controls at a waste coal CFB site located in Eastern Pennsylvania
- Miltech designed and supervised construction of erosion and sedimentation controls for three waste coal sites that deliver fuel and return ash for a CFB project in West Virginia