

TECHNICAL MEMORANDUM

Utah Coal Regulatory Program

of General

May 19, 2008

TO: *CD* Dana Dean, Associate Director Mining
 Daron R. Haddock, Permit Supervisor *DRH*
 James D. Smith, Permit Supervisor *JS 5/21/08*

FROM: Priscilla Burton, Environmental Scientist III *PWB by cu*

RE: Western Energy Training Center (WETC) Partnership with Combustion Resources (CR) and Terra Systems, Inc. (TYSI), Helper, Carbon County, Utah, General/2008/Internal.

SUMMARY:

At the request of Daron Haddock on May 7, 2007 (General/Internal file), a telephone interview was conducted to follow-up an article printed in the Sun Advocate on April 24, 2008, "From coal to coke...new processes modernize an old fuel." OSM also expressed an interest in the WTEC partnership during an Evaluation Team meeting in Price on May 13, 2008.

The Sun Advocate article indicated that WETC had formed a partnership with Combustion Resources (CR) and Terra Systems, Inc. (TYSI) to produce a coke product with raw material from local producers, using a pneumatic separator. The source of raw material, the volume of material to be stored on site and the volume of product to be produced was of interest to the Division.

WETC will store approximately 100 Tons of coal fines packaged in 1 Ton supersacks. The Division calculated that 600 sq. ft. would be required for storage of 100 Tons, which can be stacked on pallets, 2 high. Three customers each requiring 300 to 500 Tons of product indicates WETC will produce 1,500 Tons of product for sale.

DISCUSSION:

Last year, Division Inspector Peter Hess, investigated a February 1, 2007 article in the Sun Advocate titled, "Board reviews proposal for coal coking facility at energy training center." Pete indicated that the on site, research facility would utilize carbon black to process 150 Tons of briquettes for testing. Pete's report, dated March 8, 2007, is attached. It seems that between February 2007 and April 24, 2008 details of the process have changed.

The Sun Advocate articles are attached, but can also be found on line. The link for the 2008 article is <http://www.sunad.com/index.php?tier=1&pub=2008-04-24&page=focus>

The link for the 2007 article is
<http://www.sunad.com/index.php?tier=1&pub=2007-02-01&page=news>

On May 16, 2008, I had a telephone conversation with Mr. Topping, Operations Director for WETC. That conversation was followed by a telephone conversation on May 19, 2008 with Tim Gwyther, WETC Pilot Facility Manager, followed by a conversation on May 20, 2008 with Clayton Timothy, CEO, Terra Systems, Inc.

The research and development plant at WETC will burn coal fines to generate a coke product for use in industries such as steel mills, chemical plants, etc., and produce gas for energy generation. The research facility will develop specific mixes of coal fines to produce grades of coke for a variety of industries. Initially the gas product will be flared, but ultimately, the gas captured in the research process will generate ½ Mega Watt (MW) to be sold back to the energy grid.

When a product mix is successfully developed, Terra Systems, Inc. will build commercial production facility to produce the coke on a commercial scale, and in the process, capture gas to generate 1 MW of power from for the grid.

WETC will continue to do R & D to develop new mixes for new customers. It is hoped that several production plants, each generating 1 MW of electricity will be built in Carbon County and that each will be the nucleus for further industrial development. It is hoped that 200 jobs will be created directly or indirectly from this research.

Specific questions asked of Mr. Topping, Mr. Gwyther, and Mr. Timothy during the telephone interviews are written below in bold, with their comments written in italics.

Does the feed material for the research facility come from COVOL? If not where does it come from?

It does not come from COVOL. It is coal fines from any number of sources (Savage, RailCo, or direct from a mine). Eventually, we hope to use coal mine waste from abandoned mine sites, but that will require further research.

What is the relationship between Terra Systems, Inc. to COVOL/Headwaters, Inc.?

There is no connection. Previously, there was a contract between COVOL and Terra Systems to develop an air separation process at the site on Ridge Road. That contract has expired and there is no longer a connection between the two companies.

Is the Pneumatic Accelerator System another way of describing the COVOL air separation process?

No, the pneumatic accelerator system (PAS) is more efficient than the air jig. The air jig is fine for mid-size product, but the PAS is able to handle finer coal fragments. The PAS is a closed loop system that works on a different principal. It accelerates the particles and classifies them by mass density and remove moisture, which is vented off.

Current suppliers are not treating the coal fines with a PAS system. But if they were, it would be done before reaching the research facility. The coal is being screened/sized before the material arrives at the WETC research facility.

Do you do any crushing or screening of the coal tailings at the WETC research site?

No that is all arranged by suppliers prior to arriving at WETC.

What volume of tailings will be stored on site and processed by the WETC research facility?

The raw material will be brought to the site in super sacks. The WETC facility can burn 1 Ton/hour. At a rate of 20 hours/day and 5 days/week, WETC's maximum research plant capacity is approximately 400 Tons/month.

Vendors will package the coal fines into 1 Ton sacks. WETC has storage space for 80 – 100 sacks. (That is 4 or 5 semi-truck loads. Each semi-truck holds 20 Tons.) The supersacks can be double stacked, so that room for 40 – 50 pallets would be required.

What is the size of the super sack?

Each sack holds 1 Ton. The sack is approximately 4 – 5 ft. high and fits on a 42-inch square pallet.

Where will the super sacks be stored?

The sacks will be stored under an awning outside.

Given the information above, the Division calculated that 500 - 600 sq. ft. would be required for storage of 80 - 100 pallets (80 - 100 Tons).

Can you tell me about your contracts?

We have contracts with three companies. Each requires a coke mix. They are an oil refinery, a steel manufacturer, and a foundry. WETC will run its first test burn in mid-June. DOGM is welcome to observe the start-up.

Each of our three customers requires 3-500 Tons (a month's work) for a test burn to get consistency. Therefore, it will take several months of operation to prepare enough product for each client.

Is there any waste ash from the production?

There is no waste from the production. The product is sold. The ovens do not have to be cleaned, because the product is kept on trays and the trays are reused. The process works as follows:

The coal fines are treated with a surfactant to provide strength and placed on a tray in an oven to form briquettes. The trays of briquettes are then placed in the coking furnace and heated to 2000°F to be reduced to coke. There are no emissions. The off-gases will be captured (to run an engine or turbine). The coal tars will be re-used. The trays of coke are cooled and emptied onto a conveyor, which transports the coke to a silo. The coke is loaded into supersacks from the silo. The supersacks of coal are transported to the customer.

Do you have an air quality permit for this site?

Air Quality permits are in place for this site. Tom Paluso has crunched the numbers and unless the output is doubled, the WETC research facility would not require a permit from Air Quality. Jim Martin, representing Terra Systems, Inc has been in verbal communication with Air Quality, about the requirements for permitting the WETC research facility.

An Air Quality permit DAQE-R-0141330001 was confirmed for Terra Systems, Inc (Midvale address) for a location in T12 S, R10 E, SW Sec. 31. This is the location of the WETC facility.

RECOMMENDATIONS:

There is no crushing or screening on site. The products are coke and gas for energy production. To promote open communication between DOGM and WETC, a representative from DOGM should observe the start up of the WETC research facility in June 2008.

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