BEFORE THE PUBLIC SERVICE COMMISSION
OF NORTH DAKOTA

Dakota Resource Council, Neil and Laura Tangen, Myron and Nancy Eberts, and Frank and Lucy Hurt, Complainants, vs. GTLE Dakota Plant 1 LLC, Respondent.	)))))))))))	Case No. RC-09-032

BRIEF IN SUPPORT OF MOTION TO DISMISS
THE FIRST AMENDED AND SUPPLEMENTED COMPLAINT
FOR FAILURE TO STATE A CLAIM
UPON WHICH RELIEF CAN BE GRANTED,
OR IN THE ALTERNATIVE, MOTION FOR SUMMARY JUDGMENT

I. Statement of the Case

By letter dated July 28, 2008, GTL Energy (USA Limited) ("GTL USA") requested a jurisdictional determination from the North Dakota Public Service Commission (hereinafter "PSC") pursuant to North Dakota Century Code Chapter 38-14.1 regarding a proposed coal beneficiation facility (attached hereto as Exhibit #1).

In said letter, GTL USA stated that it is a wholly owned subsidiary of GTL Energy Ltd. which has developed a proprietary process to upgrade low rank coal by removing a significant amount of moisture. This process has been licensed to GTL USA.

GTL USA stated that it desires to construct a demonstration coal beneficiation facility ("beneficiation facility") in Stark County, North Dakota. GTL USA has established GTLE Dakota Plant 1 LLC (hereinafter "GTLE") to construct and operate the beneficiation facility.

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Brief in Support of Motion to Dismiss the First Amended and Supplemented Complaint
GTLE Dakota Plant 1 LLC
Brian Bjella, Crowley Fleck

As stated in the letter, coal will be brought from around the United States and other countries to the facility to test the effectiveness of the beneficiation process on a commercial scale. To demonstrate the technology, clients will provide coal for beneficiation, after which the coal will be returned to the clients for analysis of the upgraded coal.

By letter dated August 5, 2008, the Reclamation Director of the PSC stated that GTL USA does not have to obtain a surface coal mining permit as the proposed beneficiation facility will not be operated "in connection with" any coal mine, and also, because it is not a "coal preparation plant" (attached hereto as Exhibit #2).

Initially, the DRC filed a Complaint dated January 22, 2009, alleging that GTLE was conducting unauthorized surface coal mining operations asserting that the beneficiation facility is operated "in connection with" and described as a "proposed mine" pursuant to an Application dated October 15, 2008, submitted by Great Northern Power Development LP ("Great Northern"). However, by letter dated March 25, 2009, and filed by the PSC in this case, Great Northern withdrew its application for the proposed mine (attached hereto as Exhibit #3).

Thus, by Amended and Supplemented Complaint ("Amended Complaint") dated July 17, 2009, the Complainants ("DRC") revised their allegations that GTLE is conducting unauthorized surface coal mining operations by asserting that the beneficiation facility is operated "in connection with" any mine wherever located which may provide coal for testing at the beneficiation facility.

II. Procedure

This motion is brought pursuant to North Dakota Administrative Code § 98-02-02-08 and pursuant to Rules 12 and 56 of the North Dakota Rules of Civil Procedure. GTLE specifically requests that the Administrative Law Judge (Hearing Officer) as appointed in this matter, certify

this motion to the PSC for a final ruling pursuant to NDAC § 98-02-02-08(2), as this motion involves a controlling question of law, and a final determination by the PSC on this motion would materially advance the ultimate termination of any hearing. In addition, waiting until after the hearing would render the matter submitted by this motion moot and impossible for a reversal by the PSC to have any meaning.

The North Dakota Supreme Court has long recognized the appropriateness of a motion to dismiss or motion for summary judgment in resolution of administrative actions which are adjudicative in nature. *In The Matter Of Juran and Moody, Inc.*, 613 N.W.2d 503 (N.D. 2000). See also, 2 Administrative Law and Practice, § 5.42, Judgment Prior to Resolution of the Hearing, (2nd Edition-2008).

The North Dakota Supreme Court has consistently ruled that summary judgment is appropriate "if either litigant is entitled to judgment as a matter of law and if no dispute exists as to either the material facts or the inferences to be drawn from undisputed facts, or if resolving factual disputes will not alter the result." *Langer vs. Pender*, ____ N.W.2d ___, 2009 WL 903740 (N.D. 2009).

A party who moves for summary judgment must demonstrate "no genuine issues of material fact exist and the case is appropriate for summary judgment as a matter of law." If a movant meets its initial burden of showing the absence of a genuine issue of material fact, the party opposing the motion may not rest on mere allegations or denials in the pleadings, but must present competent admissible evidence by affidavit or other comparable means to show the existence of a genuine issue of material fact. *Id.*

In addition, dismissal of a complaint for failure to state a claim upon which relief can be granted under Rule 12(b)(vi) of the North Dakota Rules of Civil Procedure, and is appropriate if

the pleadings disclose with certainty the impossibility of proving a claim upon which relief can be granted. Dismissal of a complaint is permissible if the court cannot discern a potential for proof to support the claim. *Voigt vs. State*, 759 N.W.2d 530, 532 (N.D. 2008).

III. Law and Argument.

The entire premise of the Amended Complaint is that the GTLE beneficiation facility "is in connection" with any mine wherever located that will furnish coal to the facility for testing. Such an extension of the law is unwarranted under North Dakota's surface coal mining law and cannot be supported by a good faith argument for extension or modification of such law.

In addition, the attached letter (Exhibit #3) from Great Northern withdrawing its application for the Proposed Mine is all that is necessary to demonstrate that GTLE's coal beneficiation facility will not be operated "in connection with" a surface coal mine as provided in North Dakota Century Code § 38-14.1-02(33)(a), as there is no mine to possibly be "in connection with." Whether there will ever be a mine at South Heart is entirely speculative.

The Office of Surface Mining Reclamation Enforcement ("OSM") adopted what has come to be known as the Final Rule as set forth in the Federal Register at 53 F.R. 47378 and 53 F.R. 47384 (November 22, 1988). In the Final Rule, OSM stated that it "continues to believe that the ability of mine operators, or coal handlers directly serving such operators to have control of processing operations is essential in establishing that a processing plant is being operated in connection with a coal mine." Final Rule at 47385.

OSM went on to state that it is "only requiring regulatory authorities to extend their permit requirements as far into the stream of commerce as those activities over which mine operators and coal handlers who directly serve them, such as coal processors, have or could have control of operations." *Id.*

In addition, OSM stated in the Final Rule "that it is valid to consider whether a facility has a useful life independent of a specific mine or mines which it serves, in determining if the facility is operating in connection with a coal mine . . ." *Id.* at 47389.

OSM also addressed what it called "retail sales dealers" in the Final Rule. These entities have their own coal preparation facilities, and the only contact with the mine is a purchase of run-of-the-mine coal at wholesale prices. OSM indicated that because coal preparation facilities operated by retail sales dealers tend to be closely linked to end users, OSM did not expect that regulatory authorities will likely find that such facilities are operating in connection with a coal mine. *Id.* at 47390.

OSM's position with respect to end users not being "in connection with" a coal mine was affirmed in *Pacificorp vs. Office of Surface Mining Reclamation and Enforcement*, IBLA 95-175, 143 IBLA 237 (1998). The Interior Board of Land Appeals quoted with authority from the Final Rule that "OSM has not changed its interpretation that mining operations in connection with an end user are not operations in connection with a coal mine." *Id.* at 246. With respect to GTLE, the end user would be the potential licensees that want to utilize GTLE's coal beneficiation technology, as well as coal consumers who would combust a beneficiated coal.

In addition, a Federal Court of Appeals held that "some type of limiting principle of proximate causation" is very significant in determining what support facilities are subject to the federal surface coal mining law. The most likely "proximate cause" is that the processing facility depends on the mine's requirements. *National Wildlife Federation vs. Hodel*, 839 F.2d 694, 745 (Cir. D.C. 1988). In considering what constitutes a "surface coal mining operation," the court considered the language of 30 USC § 1291 (28)(B) indicating that such a definition could apply to activities on adjacent land "resulting from or incident to such activities." The

court felt that this language indicated an intent by Congress to suggest a causal connection, otherwise every support facility would be considered a "but for" result of a surface coal mining operation and subject to regulation by a federal Surface Mine Control and Reclamation Act ("SMCRA"), 30 USC § 1201, et seq. The court noted that the language "resulting from or incident to" connotes an element of proximity to the activity, and that proximity is used as a guiding principle in a flexible implementation of SMCRA. *Id.* Certainly, with respect to GTLE, since there is no mine at South Heart, there can be no mine requirements. The court also quoted with approval the position of the Secretary of the Interior in interpreting 30 USC § 1291(28), that the Department only purports to regulate facilities that are "in connection with" a surface coal mine. *Id.* at 745. However, the DRC postulates that GTLE's beneficiation facility would be "in connection with" any mine it processes coal from around the United States or the world; this is a ludicrous legal position as there is no proximity to such mines and no basis to support such an extension of the law.

Subsequent to the decision in *National Wildlife Federation vs. Hodel*, OSM issued another final rule clarifying the requirements governing off site coal preparation plants. 58 FR 3466 (January 8, 1993). OSM interpreted the case that it has the discretion to use proximity as one of several jurisdictional factors in determining whether off site processing facilities are operating "in connection with" a mine. As a result, surface mining regulatory authorities are allowed to consider geographic proximity in deciding whether an off site preparation facility is operating in connection with a mine, provided that proximity is not the decisive factor and that due consideration is also given to other relevant factors such as a processing plant's functional relationship to a mine. *Id.* at 3469. With respect to GTLE, as there is no mine within the vicinity of South Heart, there is certainly no proximity to a mine to even consider. This further points out

the baselessness of the claims made by DRC in this case. Even if there was a mine at South Heart, proximity would not be determinative as there would not be a functional relationship with the GTLE facility as its operation does not depend upon the mine's requirements.

In a related case from the Interior Board of Land Appeals, the Board was asked to consider whether a railroad and pipeline transporting coal should be considered "surface coal mining operations" as they are "facilities resulting from or incident to surface coal mines . . ." *Citizens' Coal Council*, et al., 142 IBLA 33, 35 (1997). The Board noted that the Final Rule indicates that use of the words "resulting from or incident to" connotes an element of proximity. The Board quoted with favor from the Final Rule stating that the federal Office of Surface Mining ("OSM") will address three factors when deciding whether a facility is properly considered to result from or be incident to a surface coal mining activity: (1) whether the facility is geographically proximate to the producing mine; (2) whether the facility is functionally tied to that particular mine in question; and (3) whether the facility is economically dependent upon that particular mine. *Id.* at 37. The Board held that the subject railroad and pipeline which transported the coal to the end user did not constitute facilities "resulting from or incident to" a regulated surface coal mining activity. The Board further held that such support facilities must have a direct and meaningful connection to the surface coal mine, as to hold otherwise would bring facilities within the ambit of SMCRA regulation that are not sent out functionally and/or economically tied to the regulated surface coal mining activity. The Board found nothing to indicate that Congress and the Department of the Interior intended to do so. *Id.* at 38.

The Board further noted that while the railroad and pipeline were functionally tied to and economically dependent upon the surface mining activity in the limited sense that they serve to transport coal from the mine to the point of final use; that there is no evidence that the two

facilities are otherwise functionally tied in any way "to the actual operation of or the conducting of any particular surface coal mining activity regulated by SMCRA." The Board indicated some sort of proximate causation is needed and that there was no evidence that Congress or OSM intended to apply the incidental facilities definition of surface coal mining operations in such a broad fashion. As a result, the Board affirmed that OSM's determination that the railroad and pipeline were not "surface coal mining operations." *Id.* at 39.

Just as the Interior Board of Land Appeals found in the PacifiCorp. and Citizens Coal Council cases, there must be some sort of geographic proximity to a producing mine, the facility must be functionally tied to that particular mine, and also must be economically dependent upon that particular mine. None of these three criteria apply to GTLE's beneficiation facility. There is no mine in the vicinity of South Heart and there may never be one. There is clearly no proximity, functional tie or economic dependence upon the myriad of mines around the United States and around the world that GTLE intends to test coals from. The claims of the DRC in its Amended Complaint are without merit.

In addition, to the extent allegations of DRC insinuate that GTLE is loading coal which would then constitute a "surface coal mining operation," North Dakota Century Code § 38-14.1-02(33)(a) provides in part that such loading facilities must not only be "in connection with" an actual surface mine, but also must be located "at or near the mine site." Clearly, neither of these apply to GTLE's beneficiation facility as there is no mine "at or near" the facility.

Finally, OSM stated in the Final Rule that it "would expect the economic dependence of a facility on a mine to be a critical element in determining the degree to which a facility results from or is incident to regulated mining activity." Final Rule at 47381. The GTLE facility is not economically dependent on any mine. Rather, it is dependent on whether end users from

anywhere in the world desire to utilize its coal beneficiation technology to enhance their coal's combustion capability and environmental compliance by generating less CO2 than conventional methods. To demonstrate the technology, clients will provide coal for beneficiation, after which the coal will be returned to the clients for analysis of the upgraded coal.

Attached hereto as Exhibit #4 is an affidavit from Robert R. French, CEO of GTLE indicating that GTLE intends to proceed with completion of construction of its beneficiation facility. In addition, Mr. French states that GTLE will operate the facility independent of any future South Heart Mine, which at this point is purely speculative as there may never be any such mine. As has been stated throughout these proceedings and reiterated by Mr. French in his affidavit, the purpose of this demonstration facility is to test on a commercial scale the GTLE coal beneficiation technology on coals from around the United States and around the world. Mr. French also states in his affidavit that GTLE is close to formalizing a contract with Center Coal of Center, North Dakota. Center Coal purchases pit run coal from the BNI Mine located at Center, North Dakota. Center Coal desires to have such coal processed at the GTLE facility in order to improve its combustion capabilities thus increasing the market value of the coal. Attached to Mr. French's affidavit is a letter dated March 23, 2009, from BNI Coal indicating that it is capable of and willing to deliver between 100,000 tons and 300,000 tons annually to Center Coal Company for delivery to GTLE. GTLE will not own or sell this coal; it will remain the property of Center Coal Company.

In addition, Mr. French states that GTLE has completed pilot scale coal beneficiation trials with overseas parties who have expressed an interest in sending bulk samples of coal to the GTLE facility for beneficiation tests. This confirms the primary purpose of the beneficiation facility is for testing purposes.

The affidavit of Mr. French, the pending contract with Center Coal Company, the indication of BNI Mine that it is able to deliver between 100,000 and 300,000 tons of coal annually to GTLE, and the discussions with overseas parties about bulk sample beneficiation production trials all demonstrate what GTLE has been saying all along: that GTLE's coal beneficiation facility is not being constructed "in connection with" any coal mine, nor is it financially dependent on any mine.

In its letter to the PSC dated July 28, 2008, GTL USA submitted that (1) that neither Great Northern Power nor any other coal mine operator would have control of the processing operations at the GTLE facility, (2) that the GTLE facility would have a useful life independent of any specific mine, (3) that it may act as a "retail sales dealer" under OSM regulations by offering its services to any mine, (4) that there is no "proximate cause" as its processing facility does not depend on any mine's requirements, and (5) that the economic viability of the GTLE facility is solely dependent upon itself and its ability to prove and license its technology.

The foregoing law with respect to the Final Rule, the letter which GTL USA submitted to the PSC in its request for a jurisdictional determination, and the affidavit of Mr. French all demonstrate that GTLE intends to complete construction and operate its facility irrespective of whether any mine is ever permitted at South Heart.

In its letter dated July 28, 2008 to the PSC, GTL USA stated in part that the purpose of the facility is to provide a commercial scale demonstration of its coal beneficiation technology. This is not unlike the coal processing and testing facilities located on the campus of the University of North Dakota and operated by the Energy and Environmental Research Center ("EERC"). Attached hereto as Exhibit #5 are excerpts from the website of the EERC stating in detail the significant coal testing facilities located on its campus. As stated therein, the EERC

has over 54,000 square feet of demonstration facilities. This includes a 550,000 btu/hour pulverized-coal pilot plant test furnace. Its purpose is to test the combustion capabilities of coal. In addition, the EERC facility has a coal preparation plant which crushes and pulverizes coal. Finally, the EERC maintains a Transport Reactor Development Unit, the purpose of which is to test coals for gasification using state of the art pollution control measures.

The GTLE beneficiation facility is not unlike the coal testing facilities located on the EERC campus. The purpose of each is to test various coals in order to enhance combustion capabilities and compliance with environmental laws and regulations. Thus, for the PSC to find that the GTLE facility is "in connection with a coal mine" would be to find that the EERC coal testing facilities are operated "in connection with" North Dakota coal mines and other mines from around the United States from which it tests coals. This is facetious.

Another analogy could be made to the Red Trail Energy, LLC ethanol production facility located at Richardton, North Dakota. This is a $99 million plant which began producing ethanol in January 2007. The Red Trail Energy Ethanol Plant is one of the first coal-fired ethanol plants in the nation. Coal for the Red Trail facility is delivered from a Powder River Basin (Wyoming) mine. To the best of GTLE's knowledge, no one has asserted that the Red Trail Energy ethanol plant is being operated "in connection with" the Powder River Basin mine. Again, this would be a facetious argument, but is analogous to the argument being raised by the Complainants against GTLE.

In addition, in two previous cases, the PSC has ruled that similar facilities do not need a surface coal mining permit. In *Schulte Coal, Inc.*, Case No. RC-1070-92-936 dated November 10, 1992; it was found that Schulte Coal buys its coal from BNI Center Mine, and that the plant's activities are limited to crushing, screening and sizing of coal for retail sales. It was further

found that Schulte Coal has the ability to purchase coal from other mines. The PSC held that the coal preparation plant of Schulte Coal was not operating in connection with BNI Center Mine or any other mine, and that no mining permit was needed.

More recently, in a related case, the PSC found that a proposed coal beneficiation facility to be constructed adjacent to the Coal Creek Station in Underwood, North Dakota, was not being operated "in connection with" a coal mine located in close proximity. Case No. PU-07-686. The PSC further found that the coal beneficiation facility was not being operated "in connection with" the mine despite the fact that the parent company of the mine operator was a joint venture participant in the coal beneficiation facility. Thus, in that case, there was an existing coal mine operating in close proximity to the proposed coal beneficiation facility which was to be owned in part by the parent company of the mine operator. However, as it was clearly demonstrated that the coal beneficiation facility was being operated for the benefit of the end user, being the Coal Creek Station; the PSC correctly determined that it was not being operated "in connection with" the adjacent coal mine.

GTLE submits that its beneficiation facility does not even present as close a case as was presented in Case No. PU-07-686, as there is no operating coal mine in the vicinity.

IV. Conclusion.

The Amended Complaint is based upon the allegations that the GTLE beneficiation facility is being operated "in connection with" any mine in North Dakota, the United States or around the world which would supply coal for testing. In addition, it is pure speculation to assume and to litigate this case that a new mine might at some time be applied for, let alone, ever opened at South Heart. The GTLE beneficiation facility cannot be "in connection with" a mine that is not operational. As the PSC is well aware, the permitting for and opening of

a new mine takes many years. The GTLE beneficiation facility is not being operated "in connection with" any surface coal mining operation within the State of North Dakota or elsewhere, and will also not be "in connection with" any mine which may possibly open at South Heart in the future. The GTLE facility will have its own economic life, independent of any coal mine located in North Dakota or elsewhere.

However, the GTLE facility is under construction and is anticipated to be ready for operation by the third quarter of 2009. GTLE fully intends to operate the plant as soon as it is ready assuming all other required permits have been obtained. GTLE has already obtained an air permit to operate from the North Dakota Department of Health, and a zoning permit application is pending with Stark County.

GTLE is still entitled to dismissal of the Amended Complaint either for failure to state a claim upon which relief can be granted or for summary judgment. GTLE has alleged all along and has clearly demonstrated that its facility is intended to operate independent of any mine, with its purpose being to test coals from around the country and around the world, to determine whether such coals can be improved for combustion and environmental capabilities by the GTLE coal beneficiation process. Allegations by DRC that state or federal mining law allows the Public Service Commission to assert jurisdiction over any mine located anywhere in the United States or around the world is unwarranted and cannot be supported by a good faith argument for extension or modification of such law. What the DRC's argument essentially means is that for the Public Service Commission to find that GTLE's beneficiation facility is a "surface coal mining operation" would mean that the Public Service Commission would then have to permit every such coal mine even if located in New Zealand. The allegations of DRC in its Amended Complaint are facetious and down right ridiculous.

For the foregoing reasons, GTLE respectfully requests the PSC to grant its motion.

Dated this 24th day of August, 2009.

CROWLEY FLECK PLLP
Attorneys for Respondent,
GTLE Dakota Plant 1 LLC
P.O. Box 2798
Bismarck, North Dakota 58502

By _____
BRIAN R. BJELLA (#03549)

CERTIFICATE OF SERVICE

I hereby certify that a copy of the foregoing document was on the 24th day of August, 2009, mailed to the following:

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Honorable Al Wahl
Temporary Administrative Law Judge
138 East Edmonton Drive
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Illona Jeffcoat Sacco
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_____
BRIAN R. BJELLA

Exhibit 1

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July 28, 2008

Ms. Illona A. Jeffcoat-Sacco
Executive Director
NORTH DAKOTA PUBLIC
SERVICE COMMISSION
600 E. Boulevard Avenue, Dept. 408
Bismarck, ND 58505-0480

Dear Ms. Jeffcoat-Sacco:

In re: Coal Beneficiation Facility
Our File No. -28878

We are writing on behalf of GTL Energy (USA) Limited (GTL USA), requesting a jurisdictional determination pursuant to North Dakota Century Code Chapter 38-14.1 regarding a proposed coal beneficiation facility.

I. Introduction:

GTL USA is a wholly owned subsidiary of an Australian company, GTL Energy Ltd (GTL Energy) which has developed a proprietary process to upgrade low rank coal by removing a significant amount of moisture. GTL Energy has licensed its process to GTL USA. This upgrading process raises the energy content, reduces emissions when combusted, and improves transportation and handling characteristics of the coal; and thereby increases its market value.

GTL USA operates a pilot plant in Colorado to test this proprietary upgrading process. GTL USA has completed its research and development phase, and now desires to construct its first commercial scale plant near South Heart in Stark County, North Dakota.

In order to construct this plant GTL USA intends on establishing a limited liability company known as GTLE Dakota Plant 1 LLC (Dakota 1). A lease has been obtained on a 40 acre site by South Heart Coal LLC (SHC). The lease will be subleased to Dakota 1, on which the plant will be constructed.

Initially, coal will be brought from around the United States and other countries and to the beneficiation plant and processed on tolling bases. After the South Heart Mine has been permitted and is in operation, a majority of the coal will likely be supplied by that mine.

SHC is an entity owned and controlled by associates of Great Northern Power Development LP (GNPD) and Allied Syngas Corporation (Allied). SHC will be seeking a coal mining permit from the North Dakota Public Service Commission for the South Heart Mine. Coal will then be supplied to the plant by SHC. However, this agreement will be nonexclusive, such that the Dakota 1 can process coals from any other source, including other mines in the United States and from around the world. This beneficiation plant will be entirely separate from a gasification plant planned to be constructed later by GNPD and Allied.

The 40 acre site for the beneficiation plant is located outside of the boundary of the proposed South Heart Mine. In addition, there will be no physical connection between the beneficiation plant and either the coal mine or the gasification plant. The beneficiation plant and the gasification plant will be entirely separate operations on different sites.

It is anticipated that the beneficiation plant will be constructed and operational by the second quarter of 2009.

The operations of the beneficiation plant will not be a dependent upon the coal mining requirements of SHC. The plant will provide a commercial scale demonstration of the GTL Energy beneficiation technology. It will utilize approximately 45 tons per hour of raw coal converting it into 30 tons per hour of briquette product. However, the upgraded coal from the beneficiation plant will not be utilized for the gasification plant. If the GTL Energy technology proves successful, then GTL USA would license the technology to the developer of the gasification plant.

The beneficiation plant will process coal from around the United States and the world to facilitate marketing of the GTL Energy technology. It may also be used to process coal from the South Heart Mine for sale to the stoker market, with the objective of displacing Powder River Basin imported coal with North Dakota beneficiated lignite. All products from the plant will be provided to third party end users seeking a higher BTU coal.

II. Mining Law and Regulation:

"Surface Coal Mining Operations" is defined in part to mean "activities affecting the surface of lands "in connection with" a surface coal mine. Such activities include . . . chemical or physical processing, and the cleaning, concentrating or other processing or preparation, and loading of coal at or near the mine site . . ." NDCC § 38-14.1-02(33)(a). "Surface Coal Mining Operations" also means "the areas upon which such activities occur or where such activities disturb the natural land surface." Such areas include any adjacent land the use of which is incidental to such activities such as processing areas resulting from or incident to such activities. NDCC § 38-14.1-02(33)(b). The federal Surface Mining Control and Reclamation Act ("SMCRA") contains virtually identical language is found at 30 USC § 1291(28).

It is unlawful for an operator to engage in surface coal mining operations without first obtaining a permit to do so from the Public Service Commission ("Commission"). NDCC § 38-14.1-10.

A "Coal Preparation Plant" is defined under North Dakota law to mean "a facility where coal is subjected to chemical or physical processing or the cleaning, concentrating or other processing or preparation and includes facilities associated with coal preparation activities, including, but not limited to, the following: loading facilities, storage and stock pile facilities, sheds, shops, and other buildings, water treatment and water storage facilities, settling basins and impoundments, and coal processing and other waste disposal areas." NDAC § 69-05.2-01-02(11).

A permit to operate a coal preparation plant must be obtained from the Commission. NDAC 69-05.2-09-19(1). Again, federal law with virtually identical language is found at 30 CFR § 701.5 and 30 CFR § 827.11.

III. Issue Presented:

Whether Dakota 1's coal beneficiation facility constitutes a "surface coal mining operation;" thus necessitating Dakota 1 obtaining a surface coal mining permit from the Public Service Commission ("Commission").

GTL USA believes that the coal beneficiation facility does not constitute a surface coal mining operation.

IV. Analysis:

A critical determination is what facilities are deemed "in connection with" a surface coal mining operation.

To answer this question; the courts, and state and federal agencies charged with such a determination, refer back to Office of Surface Mining Reclamation and Enforcement ("OSM") final rules as set forth in the Federal Register at 53 FR 47378 and 53 FR 47384 (November 22, 1988) ("Final Rule"). The purpose for which was to clarify circumstances under which coal preparation plants and support facilities located outside of a permit area of a mine are subject to the permitting requirements of SMCRA.

OSM was concerned that a prior definition of "coal preparation" could be interpreted to regulate certain coal preparation plants which are not actually regulated under SMCRA. "More closely tracking the language of SMCRA in this final rule, OSMRE ensures that coal preparation activities that are carried out 'in connection with' a coal mine are appropriately regulated under SMCRA." Final Rule at 47385.

OSM stated that the purpose of the Final Rule was to clarify that only offsite coal preparation plants that are "in connection with a coal mine" are subject to regulation. *Id.*

Excluded are facilities at the site of ultimate use. *Id.* Due to a change in definition, OSM could no longer treat facilities which handle coal as either "in connection with" a mine or with an end user, as it could when the definition of coal preparation was based on the separation of coal from its impurities. It cited, for example, facilities such as the docks at Baltimore, Maryland, and Long Beach, California, that may occasionally crush or size coal, and may also conduct "coal preparation" under the new definition. OSM clarified that it does not believe that such activities at those facilities are "in connection with a coal mine, or that (SMCRA) was intended to regulate the activities at such facilities." *Id.*

OSM did note that the term "in connection with" is not defined. It was the desire not to define the phrase such that it would unduly restrict the discretion that regulatory authorities must have in order to make valid decisions about the applicability of SMCRA. *Id.*

Of significance, it was stated that OSM "continues to believe that the ability of mine operators, or coal handlers directly servicing such operators, to have control of processing operations is essential in establishing that a processing plant is being operated in connection with a coal mine." *Id.* This is a critical and very important statement, which has the effect of exempting the Dakota 1 facility from the definition of a coal preparation plant. South Heart Coal will not have control over the beneficiation facility, and no usable coal product will be returned to either the mine or the gasification plant. The operations of the Dakota 1 facility are not dependent upon South Heart Coal's requirements.

OSM went on to state that it is "only requiring regulatory authorities to extend their permit requirements as far into the stream of commerce as those activities over which mine operators and the coal handlers who directly serve them, such as coal processors, have or could have control of operations." *Id.* South Heart Coal will not have control of the Dakota 1 coal beneficiation facility.

In the Final Rule, OSM went on to state that it "believes that geographic proximity, as well as the functional relationship between the mines and coal preparation plants, are proper factors to be considered by regulatory authorities when identifying off-site preparation plants which are operated in connection with a coal mine and therefore are subject to regulation under SMCRA." *Id.* at 47386. In this case, the Dakota 1 facility is located outside of the South Heart mine. The mine will exist separate from the Dakota 1 facility, and thus the mine has no functional relationship to the facility.

As stated by OSM, "there is nothing in the Act or its history that implies that SMCRA was meant to apply nation-wide to all industrial facilities that process coal irrespective of whether or not they are operating in connection with a coal mine." *Id.* For example, OSM stated that Congress did not intend that "shipping areas," regardless of their association with coal mines can be regulated under SMCRA. *Id.* at 47387.

OSM went on to state that "the purpose of this rule is to recognize that there are processing facilities other than those at the point of use that are not in connection with a coal mine, and to ensure that jurisdiction is extended only to preparation plants operating in connection with a coal mine." *Id.* Thus, the Final Rule does not mandate that to be exempt the facility must be at the point of ultimate use; other facilities are also exempt. One of the purposes of the Final Rule was that OSM "wishes to appropriately limit and concisely state the jurisdiction provided in (SMCRA) over coal preparation which results from or is incident to an activity 'in connection with' a coal mine." Thus, OSM revised the rules to incorporate the phrase "in connection with," which is also in SMCRA. *Id.* at 47388.

OSM went on to state that it has not changed its interpretation that operations in connection with an end user are not operations in connection with a coal mine. "Coal preparation facilities which are being operated only in connection with another industrial facility, such as the power plant of concern to this commentator, does not operate in connection with a coal mine and are not subject to the rule." *Id.* at 47388. The Dakota 1 coal beneficiation facility will operate totally independently of any other industrial facility.

Of considerable significance is that the Dakota 1 facility would initially only utilize lignite from either existing North Dakota mines or coals from around the world. To the extent that the facility will utilize such out of area coal, it clearly would not be "in connection with" the South Heart Mine and thus exempt from the definition of a "surface coal mining operation".

In the Final Rule, OSM stated "that it is valid to consider whether a facility has a useful life independent of the specific mine or mines which it serves, in determining if the facility is operating in connection with a coal mine..." The Dakota 1 facility will have a useful life independent of coal from the South Heart Mine, as its purpose is to prove the beneficiation technology on a commercial scale. Id. at 47389.

In addition, in the Final Rule OSM discussed what it called "retail sales dealers," which have their own coal preparation facilities, and where the only contact with a mine is the purchase of run of the mine coal at wholesale prices. While OSM was not willing to state with certainty that all such facilities do not operate in connection with the coal mine; it did indicate that because coal preparation facilities operated by retail sales dealers tend to be closely linked to end users, OSM did not expect that regulatory authorities will likely find that such facilities are operated in connection with a coal mine. Id at 47390.

In many respects, the Dakota 1 facility will operate as a "retail sales dealer" as it has its own coal preparation facility, and its only contact with the South Heart Mine would be to purchase run of the mine coal. As no usable coal product is returned to the mine, the Dakota 1 facility is clearly not operated "in connection with" the mine. The Dakota 1 facility is closely linked to its ultimate end users, being those facilities which desire beneficiated coal to meet environmental requirements or improve plant efficiency.

OSM agreed that as SMCRA's primary emphasis is on reclamation and post mining land use; it would be inappropriate to extend SMCRA to industrial facilities designed for long-term use and not operated in connection with a coal mine. *Id* at 47389.

In a recent case, a federal court of appeals acknowledged that the Secretary of Interior's interpretation of provisions of SMCRA when the statute is silent or ambiguous are given deference if reasonable. The court recognized that SMCRA is a complex and puzzling statute, and in many cases raises a variety of issues as to its correct interpretation. *Citizens Coal Council v. Norton*, 330 F.3d 478, 481 (Cir. D.C. 2003).

OSM's interpretations set forth in the Final Rule clearly indicate that coal processing facilities for the purpose of the end user are not "in connection with" a surface coal mining operation.

This position was affirmed in the Interior Board of Land Appeals' decision in *Pacificorp v. Office of Surface Mining Reclamation and Enforcement*, IBLA 95-175, 143 IBLA 237 (1998). In this case, the mine operator also operated a preparation plant through a wholly owned subsidiary. The preparation plant was located on the site of a power plant. The coal processed at the plant was used by the adjacent power plant. The issue was whether the coal preparation plant must be permitted as a surface coal mining operation. The Board noted that under relevant Utah law that a permit is required for all coal preparation plants operating in connection with a coal

mine, leaving unregulated only coal preparation plants operated solely in connection with an end user or operated without connection to a mine or end user. *Id.* at 242. The Board quoted with approval from the Final Rule that "OSM has not changed its interpretation that mining operations in connection with an end user are not operations in connection with a coal mine. Coal preparation facilities which are being operated only in connection with another industrial facility, such as the power plant of concern to this commentator, do not operate in connection with a coal mine and are not subject to the rule." *Id.* at 246.

The Dakota 1 facility will operate without connection to the South Heart mine and is for the sole purpose of end users.

Of significance is a ruling from a federal court of appeals in one of the many challenges to SMCRA regulations. The issue was the extent of SMCRA's jurisdiction over processing and support facilities. *National Wildlife Federation v. Hodel*, 839 F2d 694 (Cir.D.C. 1988). While upholding regulations providing jurisdiction over "processing areas" that are not necessarily at but near the mine site; the court also recognized that OSM only purports to regulate facilities which must be "at or near" and are also "in connection with" a surface coal mine as defined in 30 USC § 1291(28)(a).

The court stated that the phrase "resulting from or incident to" language in subsection (b) of the SMCRA definition, "clearly suggests a causal connection, which, while not indicating an element of geographic proximity, certainly does require some sort of limiting principle of proximate causation that is familiar to the courts in tort law. Otherwise, every support facility that could be considered a "but for" result of a surface coal mining operation would be subject to SMCRA regulation." In addition, the court stated that "resulting from or incident to" with respect to a facility "connotes an element of proximity to that activity." *Id.* at 745.

These statements by the Federal Court of Appeals that "resulting from or incident to" requires "some type of limiting principle of proximate causation" is very significant in determination of what processing facilities are subject to SMCRA. The most likely "proximate cause" is that the processing facility depends on the mine's requirements. In this case, operational success of the Dakota 1 facility will not depend upon the mine's requirements. The sole purpose of the Dakota 1facility is to serve the end user purchasers of its beneficiated coal.

In the Final Rule discussing support facilities, it was stated that OSM "would expect the economic dependence of a facility on a mine to be a critical element in determining the degree to which the facility results from or is incident to regulated mining activity." Final Rule at 47381. In this case the Dakota 1 facility is not economically dependent on the mine, but on its end users, who desire the higher value BTU coal.

V. Environmental Considerations:

In some of the court and administrative law decisions, there was concern that if the coal processing plant was not regulated under SMCRA, that it would be left unregulated. However, there should be no such concerns regarding the Dakota 1 facility. The plant will require an air quality permit and a water discharge permit as issued by the North Dakota Department of Health.

A key advantage of the GTL USA beneficiation process is that it produces negligible emissions. All coal handling and processing will be contained inside buildings. Thus, the collection systems (wet scrubber plus bag/house) will be used to contain particulates and re-use nearly all of the dust created in processing the coal. The only plant emissions will be low amounts of particulates from a gas-fired boiler and the collection systems; along with water vapor emitted from a stack and clean condensed water (both of which have very low concentrates of volatile and semi- volatile organic compounds). As noted, all such emissions and discharges will be regulated by the North Dakota Department of Health.

VI. Other Considerations:

Coal produced from mines in North Dakota is subject to the coal severance tax on a tonnage basis. NDCC Chapter 57-61.

However, coal beneficiation plants are taxed in an entirely different manner. "Coal beneficiation" is defined to mean "improving the physical, environmental, or combustion qualities of coal, but does not include crushing or treatment with dust suppressants or freeze-proofing agents." NDCC § 57-60-01(2). A coal beneficiation facility is deemed for purposes of taxation only to be a "coal conversion facility." NDCC § 57-60-01(3). Such facilities are taxed at the rate of 20¢ on each ton of 2000 pounds of coal of beneficiated coal produced for the purpose of sale, or 1¼% of the gross receipts derived from such facility for the preceding month, whichever amount is greater. NDCC § 57-60-02(6).

Thus, under North Dakota law; coal beneficiation facilities are clearly treated not as coal mines but as coal conversion facilities for purposes of taxation.

It is anticipated that the Dakota 1 facility will be subject to regulation by the federal Occupational Safety and Health Administration ("OSHA") with respect to plant health and safety. A determination by the Commission that the coal beneficiation facility constitutes a "surface coal mining operation" could make it also subject to health and safety regulation by the federal Mine Safety and Health Administration ("MSHA"). However, a determination by the Commission that the coal beneficiation facility does not constitute a "surface coal mining operation" would likely mean that the facility will only be regulated by OSHA thus avoiding bifurcated health and safety jurisdiction over the same facility.

VII. Conclusion:

Recently, the Commission was requested to make a similar jurisdictional determination in Case Number PU-07-686. The Commission issued its determination on October 4, 2007 finding that the facility under consideration was not a "surface coal mining operation." GTL USA submits that the Dakota 1 facility does not present even as close a case. That is, the primary purpose of the Dakota 1 facility is to prove the beneficiation technology on a commercial scale. Initially, the plant will not even utilize coal from the proposed South Heart Mine. All beneficiated coal will be sold to third party end users.

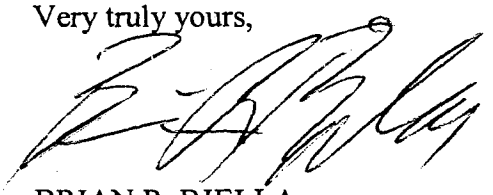
The proposed coal beneficiation facility of Dakota 1 is clearly not a "coal preparation plant" or "support facility" operated "in connection with" or "resulting from or incident to" a surface coal mining operation. It is not owned or operated by SHC, and no usable coal product is returned to the mine. What happens with the coal after beneficiation is solely the determination of Dakota 1.

OSM's own interpretation of the Final Rule does not merely exempt "coal preparation plants" constructed on the site of the ultimate end user, but clearly indicates that the rule also excludes processing facilities other than those at the point of the ultimate user that are not in connection with the coal mine. In this case, the ultimate user is large industrial facilities located in North Dakota and elsewhere who want to purchase beneficiated lignite to meet environmental requirements.

In many respects, Dakota 1 will operate as a "retail sales dealer" as discussed in the Final Rule. The facility will have a useful life independent of any specific mine, and is not functionally or economically tied to any regulated surface coal mining operation.

The Dakota 1 coal beneficiation facility is not a "surface coal mining operation" under Chapter 38-14.1, NDCC. GTL USA respectfully requests the Commission to concur in this determination.

Very truly yours,



BRIAN R. BJELLA

Public Service Commission
State of North Dakota

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Bismarck, North Dakota 58505-0480
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August 5, 2008

Brian R. Bjella
Fleck, Mather & Strutz, Ltd.
400 East Broadway, Suite 600
P.O. Box 2798
Bismarck, ND 58502-2798

Re: Jurisdictional Determination for a Coal Beneficiation Facility
Case No. RC-08-611

Dear Mr. Bjella:

On July 28, 2008 you filed a request on behalf of GTL Energy (USA) Limited for a jurisdictional determination from the Commission pursuant to N.D.C.C. Chapter 38-14.1 for a proposed coal beneficiation facility. The proposed facility to be located near South Heart will upgrade lignite by removing a significant amount of moisture and then be provided to third party end users.

This request is somewhat similar to one filed last year on behalf of a joint venture between The North American Coal Corporation and Great River Energy for another type of coal beneficiation facility. The Commission discussed that request and determined that the coal beneficiation facility was not a surface coal mining operation under N.D.C.C. Chapter 38-14.1. Since the coal beneficiation facility proposed by GTL Energy (USA) Limited will not be operated "in connection with" the proposed coal mine near South Heart or any other coal mine and because it is not a "coal preparation plant", the facility is not a "surface coal mining operation" under N.D.C.C. Chapter 38-14.1. Therefore, GTL Energy (USA) Limited does not have to obtain a surface coal mining permit from the Commission for the coal beneficiation facility.

Sincerely,

James R. Deutsch
Director
Reclamation Division

m\gen corr\2008\GTLE_jurisd_determ_8-5-08

Great Northern Project Development LP
173 Cottonwood Road
Townsend, MT 59644
(406) 266-4360 • Fax (406) 266-4577

March 25, 2009

Mr. James Deutsch
Director – Reclamation Division
North Dakota Public Service Commission
600 East Boulevard, Dept.408
Bismarck, ND 58505-0480

Re: Withdrawal of Mine Permit Application No. SHSH-0801 - South Heart Lignite Mine

Dear Mr. Deutsch:

On behalf of South Heart Coal LLC (SHC), Great Northern Project Development LP (GNPD) is writing to notify the North Dakota Public Service Commission (PSC) of SHC's decision to withdraw Surface Coal Mining Permit Application No. SHSH-0801 for the South Heart (SH) lignite mine.

SHC is aware of a complaint (Case No. RC-09-32) filed with the PSC alleging that the GTLE demonstration plant currently under construction near the site of the planned SH lignite mine is "in connection with" the SH lignite mine. SHC is also aware that the complainants have made additional allegations, including that GTL Energy is in violation of North Dakota statute and regulation for "conducting surface coal mining operations without a permit," all apparently based upon the "in connection with" allegation.

These allegations are incorrect. The SH lignite mine and the GTLE demonstration plant are separate and independent projects. They have different purposes and are owned and controlled by different entities. Contrary to the recent allegations, there is no "connection" between the GTLE demonstration plant and the SH lignite mine such that they should be treated as a single project entity under the PSC regulations. In order to make clear that there is no such "connection" between the planned SH lignite mine and the GTLE demonstration plant, SHC is hereby formally withdrawing its application for a permit to construct and operate the SH lignite mine.

Development work is continuing on GNPD's planned commercial-scale coal gasification facility and associated surface lignite mine to be located near South Heart. Applications for required approvals for those facilities are planned for later this year. GNPD and SHC look forward to continuing their work with the PSC and its staff to obtain those approvals.

Sincerely,

Richard A. Southwick
Vice President – Environmental

cc: Todd Joyner, President GNPD
Rich Voss, VP GNPD

13 **RC-09-32** Filed: 3/25/2009 Pages: 1
Letter Filed Withdrawing Permit Application SHSH-0801

Great Northern Project Development

Richard Southwick

10 RC-08-828 Filed 03/25/2009 Pages: 1
Letter Filed Withdrawing Permit Application SHSH-0801
Great Northern Project Development
Richard Southwick

BEFORE THE PUBLIC SERVICE COMMISSION
OF NORTH DAKOTA

Dakota Resource Council, Neil and Laura Tangen, Myron and Nancy Eberts, and Frank and Lucy Hurt, Complainants, vs. GTLE Dakota Plant 1 LLC, Respondent.	))))))))))))	Case No. RC-09-032

AFFIDAVIT OF ROBERT R. FRENCH

STATE OF COLORADO)
)SS.
COUNTY OF LARIMER)

The undersigned, being first duly sworn, being of lawful age, declares and states as follows:

1. That I am the CEO of GTLE Dakota Plant 1 LLC (hereinafter "GTLE").

2. That GTLE is in the process of constructing a coal beneficiation facility located near the City of South Heart, North Dakota.

3. That the purpose of the coal beneficiation facility is to provide a commercial scale demonstration facility of the coal beneficiation technology developed by GTL Energy Ltd.

4. That the coal beneficiation plant will demonstrate the commercial viability of the beneficiation process by testing coals from mines around the United States and around the world.

5. That should the coal from any mine prove amenable to the beneficiation process, then the process would be licensed to a developer to build a commercial scale facility. As a result, the coal beneficiation facility is not dependent upon the requirements of any coal mine whether now opened or to be opened in the future.

6. That the GTLE coal beneficiation plant is currently under construction, with construction having commenced on 14 October 2008. To date, the construction of the plant is approximately 75% percent complete, with GTLE having committed to the expenditure of approximately $13 million dollars of proposed total project cost of $15 million dollars.

7. That GTLE intends to open and operate the coal beneficiation facility as soon as construction is completed, currently estimated for the third quarter of 2009.

8. That GTLE will operate its coal beneficiation facility whether or not any proposed mine is ever opened at South Heart whether by Great Northern Project Development LP or any other mining entity. No mining entity will have any control over the operation of the coal beneficiation facility, GTLE will have sole control over operations.

9. That GTLE is currently engaged in contract negotiations with Center Coal Company of Center, North Dakota, to process coal which Center Coal Company purchases from the BNI Center Mine. The coal would be owned by Center Coal Company, not GTLE. The purpose of the processing would be to enhance the combustion capability and environmental quality of the coal.

10. That GTLE has conducted coal beneficiation trials at its pilot plant in Colorado with overseas parties who have expressed an interest in shipping bulk volumes of coal to the GTLE facility to conduct bulk scale testing trials, in order to confirm the application of the GTLE coal beneficiation technology to the overseas parties' coals.

11. GTLE is not a mining company. It does not own coal resources, nor does it own leases or contracts that will allow it to become a mining company.

12. Assuming the GTLE facility confirms the commercial viability of the technology and equipment, North Dakota coal producers and end users would be provided with an opportunity to use a higher efficiency coal that generates less CO2. This may allow North Dakota coal producers to recapture markets previously lost to imported lower grade coals.

Dated this 6 day of August, 2009.

ROBERT R. FRENCH

STATE OF COLORADO)
)SS.
COUNTY OF LARIMER)

Subscribed and sworn to before me this 6 day of August, 2009, by Robert R. French.

JOY CHENEY
(SEAL) NOTARY PUBLIC
STATE OF COLORADO
MY COMMISSION EXPIRES 10/13/2009

Notary Public
Larimer County, Colorado
My Commission Expires:

Exhibit 5

UND UNIVERSITY OF NORTH DAKOTA

EERC Energy & Environmental Research Center®

EERC TECHNOLOGY – PUTTING RESEARCH INTO PRACTICE

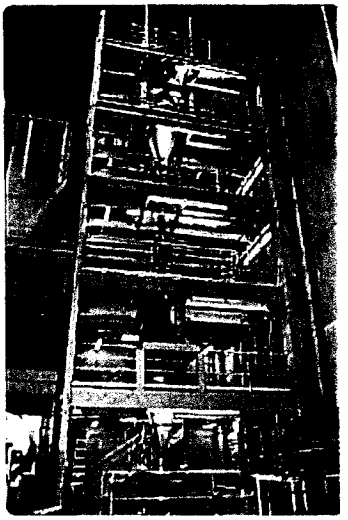
Technology Demonstration

Since its creation in 1951, the EERC has always focused on moving technologies from the research and development stage through demonstration and on to commercialization. Demonstration can often be the most trying component of any new technology and is sometimes referred to as the valley of death. The EERC has significant expertise in moving technologies into, and through, the demonstration phase with great success.

The EERC's success in developing and conducting demonstrations is due to its extensive experience, capabilities, facilities, and industrial partnerships. The EERC understands that demonstration projects require coordination among all stakeholders if they are going to be successful.

Facilities

The EERC has over 54,000 square feet of demonstration facilities. These facilities contain a variety of demonstration venues for a variety of technologies as well as space for construction of new pilot-scale components to fit client needs. Additionally, the EERC has been involved in many projects which are demonstrated off-site but require its technical and field sampling expertise.



Much of the design and creation of equipment and machinery for our demonstration facilities is done on-site in our **in-house machine shop**. This allows the EERC to demonstrate technologies in a more rapid, cost-effective way.

Demonstration Facility I

Demonstration Facility I is a 6000-square-foot facility containing seven pilot-scale units to demonstrate the combustion of solid and liquid fuels such as coal, biomass (rice hulls, switchgrass, sunflower hulls), sewage sludge, and oil slurries. The units focus on operational issues and environmental emission controls. These units serve as a cost-effective way of testing fuels and system components prior to full-scale testing.

Lorne "Mack" McEwen Demonstration Facility II

The Lorne "Mack" McEwen Demonstration Facility II is a 4000-square-foot high-bay area. This area contains systems including the slagging furnace system/high-temperature air furnace (HITAF), the continuous emission process simulator, and state-of-the art SO_3 removal systems. The small-scale systems allow us to study the fundamentals of combustion, while the larger systems focus on scale-up and practical issues. The HITAF has been used extensively in the demonstration of a variety of emission control systems for a variety of clients.

Process Tower

The process tower is a four-story complex housing two advanced power systems. The transport reactor development unit (TRDU) is an advanced power system that meets the future needs of the U.S. Department of Energy's FutureGen Program, which promotes energy technologies of the future. The transport reactor has been shown to produce high levels of hydrogen, and testing has been conducted on new hydrogen separation membranes. The EERC conducts studies in support of the Wilsonville scale-up facility as well as other industrial clients. The atmospheric circulating fluid-bed reactor has also been used extensively for economical testing of fuels and operational issues.

Process Development Facility (high-pressure fuel processing)

The process development facility houses the EERC-patented 6-ton/day process development unit (PDU) that can turn lower-quality solid fuels into higher-quality slurries. Through a process called **hot-water-drying**, the PDU removes the moisture inside of solid fuels, seals their pores and slurries the fuel for ease of use. This system has shown great promise for use with low-rank coals, biomass, and sewage sludge.

Fuel Preparation and Testing

The EERC has extensive capabilities to grind, pulverize, shred, size-classify, and store a variety of solid fuels. The Fuel Preparation and Testing facility can accept up to a semiload of fuel at a time. It can handle fuels such as coal, biomass, and virtually any material that can be handled like coal. In addition to supporting internal EERC activities, this equipment is occasionally utilized to produce fuels for outside clients conducting limited pilot-scale tests.

Energy & Environmental Research Center (EERC) • 15 North 23rd Street, Stop 9018 • Grand Forks, ND 58202-9018 • USA • Phone: (701) 777-5000 • Fax: (701) 777-51

Combustion Test Facility

Research programs have been under way at the EERC for more than 28 years to study ash fouling of boiler heat-transfer surfaces in coal-fired utility boilers. A 550,000-Btu/hr pulverized-coal pilot plant test furnace was constructed in 1967 to evaluate the influence of variables, including ash composition, excess air, gas temperature, and tube wall temperatures on ash fouling. Results from this work have shown a strong correlation between ash characteristics, boiler operating parameters, and degree of fouling.

The research capabilities of the combustion test facility (CTF) have been enhanced over the years and expanded to provide information on a wide range of combustion-related issues. To achieve a wide range of operating conditions, the refractory-lined furnace may be fired at a rate (approx. 70 lb coal/hr) sufficient to achieve a furnace exit gas temperature as high as 2500°F. Most tests are performed with the furnace exit gas temperature maintained at approximately 2000°–2200°F.

Research Applications of the Pilot-Scale Combustion Equipment

- Determine ash-fouling rates and the strength, composition, and structure of fouling deposits for coals of all rank and also determine the effectiveness of ash-fouling additives.
- Apply sophisticated analytical methods to characterize input coal, ash, and deposits and to correlate coal and ash properties with deposit growth rates and strength development.
- Evaluate the combustion characteristics of coal–water and biomass fuels, municipal solid waste, and petroleum coke.
- Determine fly ash collection properties of various fuels by electrostatic precipitation (ESP) or fabric filtration using a pulse-jet baghouse, including high-temperature applications.
- Evaluate the slagging potential and slag corrosion in a simulated wet-bottom firing mode.
- Perform flame stability tests for comparing a particular fuel at full load and under turndown conditions.
- Evaluate fouling, slagging, and ESP performance for blends of bituminous and subbituminous coals.
- Evaluate the combustion properties of petroleum coke, alone and in blends with subbituminous and lignite coals.
- Evaluate sorbent injection for SO_x control and assess integrated particulate and SO_x/NO_x control.

The CTF is fully instrumented to provide online analysis of the flue gas. Three flue gas sampling ports are available, although only two are used on a regular basis. Flue gas concentrations of O_2, CO_2, and SO_2 are obtained simultaneously at the furnace exit and stack. Emissions of CO and NO_x are obtained at the furnace exit. System O_2, CO, and CO_2 analyzers are manufactured by Beckman; the SO_2 analyzers are manufactured by DuPont; and NO_x is measured with a ThermoElectron chemiluminescent analyzer. All system temperatures, pressures, and flue gas analyses are recorded continuously to chart recorders and the system's computer-controlled data acquisition system.

Coal is pulverized remotely in a hammer-mill pulverizer to a size of 70% less than 200 mesh (75 µm). The coal is then charged to a microprocessor-controlled weight loss feeder from a transport hopper. Combustion air is preheated by an electric air heater. The pulverized coal is screw-fed by the gravimetric feeder into the throat of a venturi section in the primary air line to the burner.

Heated secondary air is introduced through an annular section surrounding the burner. Heated tertiary air is added through two tangential ports located in the furnace wall about 1 ft above the burner cone. The percentages of the total air used as primary, secondary, and tertiary air are usually 10%, 30%, and 60%, respectively. An adjustable swirl burner, which uses only primary and secondary air with a distribution of approximately 15% and 85%, respectively, is used during flame stability testing. Flue gas passes out of the furnace into a 10-in.-square duct that is also refractory-lined. Located in the duct is a vertical probe bank designed to simulate superheater surfaces in a commercial boiler. The fouling probes are constructed of 1.66-in.-OD Type 304 stainless steel pipe cooled to a surface metal temperature of 1000°F (or other specified temperature) with steam. Deposit strength can be assessed by laboratory determinations using a drop impactor technique and by scanning electron microscopy (SEM). The drop impactor technique provides a calculated measurement of deposit strength, taking into account the conditions under which the test was performed. SEM point count provides a point-by-point analysis of the deposit. These data can be used to calculate the viscosity of each data point that can be related to deposit strength.

After leaving the probe bank duct, the flue gas passes through a series of water-cooled heat exchangers before being discharged through either an ESP or pulse-jet baghouse. The test furnace has numerous ports that permit observation of the probes and the furnace burner zone during the test run. These ports can also be used for installation of additional test probes, auxiliary measurements, photography, or injection of additives.

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UND UNIVERSITY OF NORTH DAKOTA

EERC Energy & Environmental Research Center®

EERC TECHNOLOGY – PUTTING RESEARCH INTO PRACTICE

Coal Preparation

Material can be delivered either by truck or railcar. Solid feedstock is prepared to the desired specifications and stored in nitrogen-purged bunkers. The following equipment is available for feedstock preparation:

- Williams coal and rock crusher
  - Capacity: 4 tons/hr coal or rock to ¼ in.
- Mikro pulverizer
  - Capacity: 1 ton/hr to 200 or 325 mesh
  - Other bar screen sizes can be purchased
- Kason classifier
  - Capacity: 4 to 5 tons/hr
  - Screen sizes include 1, 3/4, 1/2, 1/4, and 1/16 in. and 4, 6, 10, 20, 30, 40, 50, 60, 100, 150, 200, and 325 mesh

A steam dryer is available to dry feedstocks before they enter the carbonizer or transport reactor development unit (TRDU). The objective of drying the feed material is to reduce or eliminate the net production of wastewater, reduce the heat load of the feed, or reduce feed problems that are inherent with excess surface moisture.

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Transport Reactor Development Unit (TRDU)

The transport reactor concept is an advanced gasification power system that meets the future needs of DOE's FutureGen program which promotes energy technologies of the future. This system can be used to produce a combination of the following:

- Electricity
- Synthetic natural gas
- Hydrogen gas stream

The design of the transport reactor allows for a low-capital-cost gasification system that can use state-of-the-art pollution control systems. The transport reactor development unit was built to facilitate testing at the Power Systems Development facility in Wilsonville, Alabama. Clients include DOE, M.W. Kellogg, Southern Company Services, the Electric Power Research Institute, North Dakota Industrial Commission, and many more.

Solids enter the system in a nonpressurized hopper with a capacity of 2500 lb. The coal is gravity-fed into the pressurized coal lock hopper, which has a capacity of 1700 lb. A set of valves isolates the pressurized lock hopper from a small, pressurized surge hopper, which maintains an uninterrupted flow of coal while the pressurized coal hopper is being filled. An auger at the bottom of the surge hopper meters the solids. The rotational speed of the auger is controlled to produce various feed rates. The feed auger drops the solids into a high-velocity gas stream of ambient temperature or preheated nitrogen or air (572°F/300°C). The solids can also be augered into the carbonizer rather than by pneumatic transport.

The TRDU proper consists of a riser section with an expanded mixing section at the bottom, a disengager on top of a solids standpipe, and a cyclone with its associated dipleg. The solids standpipe is connected to the riser mixing section by a J-leg transfer line. All of the components in the system are refractory-lined and designed to operate at 120 psig and an internal temperature of 2000°F (1090°C).

The premixed coal and limestone fed to the transport reactor can be admitted through three nozzles located at various elevations on the riser. During operation, feed will be admitted through only a single nozzle at a time.

Oxidant is fed to the riser by three pairs of nozzles at differing elevations within the mixing zone. For the combustion mode of operation, two additional nozzles are provided in the riser to introduce secondary air. Hot solids from the standpipe are recirculated through the J-leg into the mixing zone, where they come in contact with the oxidant and steam. This feature prevents exposure of the raw coal to the oxidants, preventing combustion of the volatile matter released. Only char is burned to provide process heat. This staged gasification process is expected to improve process efficiency. All gasification, combustion, and desulfurization reactions are carried out in the riser as coal, sorbent, and oxidant (with steam for gasification) flow up the tube.

The bulk of entrained solids leaving the riser is separated from the gas stream in the disengager and recirculated back to the riser via the standpipe and J-leg. Gas exiting the disengager is further screened of solids as it enters the cyclone. Gas exiting the cyclone passes through the hot-gas cleanup loop and proceeds to the gas quench train. Solids removed by the cyclone are reintroduced to the standpipe and, in turn, to the riser. A solids stream is withdrawn from the standpipe via a cooling auger system to provide a means of removing accumulated ash and spent sorbents. The rate at which solids are removed from the system is determined by the level of solids inventory in the standpipe.

The TRDU is fully instrumented with an array of internal thermocouples, pressure and differential pressure transmitters, and gas flowmeters. All measured process variables are controlled and recorded by a PC-based process control and data acquisition system.

Gas Quench and Liquid Separation

Gas passes through the sieve tower and then the two water scrubbers. The gas stream enters the bottom of the sieve tower, where it passes through a series of perforated plates. The plates in the sieve tower are connected for easy removal for inspection and maintenance. In the sieve tower, recycle oil from the bottom of the tower is cooled and used to quench the incoming gas. Heat exchangers are used to cool the recycle streams in the sieve tower. The Dowtherm on the shell side of this heat exchanger can be heated electrically or cooled by passing through the tube side of a water-cooled heat exchanger, removing heat from the overall system. The tar and oil product is placed in 55-gal barrels for storage and/or analysis. After the sieve tower, the gas enters a direct-contact water scrubber (venturi cyclone) and is sent to a flare.

Next is a series of two direct-contact water scrubbers (venturi scrubbers/cyclones) that are used when the gas stream contains minimal amounts of vaporized organic liquids. The gas stream is cooled to between 200° (93°) and 225°F (107°C) in the first water scrubber and to below 125°F (52°C) in the second scrubber. Heat is removed from the recirculating water/oil-cooling fluid by a bank of water-cooled tube-and shell heat exchangers. The gas from the second venturi is flared, and the liquid products are stored in 55-gal barrels. The flare operates at a temperature of 1800°F (982°C) and a residence time of 0.5 seconds.

Hot-Gas Filter Vessel

The hot-gas filter vessel (HGFV) is designed to handle all of the gas flow from one TRDU at its expected operating conditions. The vessel is approximately 48-in. i.d., and 185-in. long and designed to handle gas flows of approximately 325 scfm at temperatures up to 980°C (1800°F and pressures of 130 psig. The refractory lining brings the i.d. down to 28 in., with a 24-in.-i.d. shroud to distribute the airflow. The vessel is sized such that it could handle candle filters up to 1.5 m long; however, 1-m candles are expected to be utilized in the initial 540°C (1000°F) gasification tests. Candle filters are projected to be 2.375-in. o.d. and with a minimum 4-in. center line-to-center line spacing.

The following are the design criteria and range of operating conditions for the HGFV:

- Inlet gas temperature: 590°–980°C (1000°–1800°F)
- Operating pressure: 120–150 psig
- Volumetric gas flow: 325 scfm
- Number of candles: 19 (1 or 1.5 m)
- Candle spacing: 4.25 in.
- Filter face velocity: 2.5–10 ft/min
- Particulate loading: <10,000 ppm
- Temperature drop access HGFV: <30°C (50°F)
- Nitrogen backpulse system: unheated

Ports have been added to the filter vessel to allow temperature and pressure measurements to be obtained and for the insertion of a water-cooled borescope probe for inspecting candle filters online. The ash letdown system consists of two sets of alternating high-temperature valves, with a cylindrical pressure vessel to act as a lock hopper. Additionally, a preheat natural gas burner is used to prevent condensation from collecting in the vessel while the gasifier is starting up.

The nitrogen backpulse system will backpulse up to four sets of four or five candle filters in a time-controlled sequence. The pulse length and volume of nitrogen displaced into the filter vessel are controlled by the regulated pressure (up to 900 psig) of the nitrogen reservoir and the solenoid valves used to control the timing of the gas pulse.

High-Pressure and High-Temperature Sampling System

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