Oil and Gas Research Program

North Dakota

Industrial Commission

Application

Project Title: **"Wellhead Gas Capture Via CNG Technologies"**

Applicant: Bakken Express, LLC

Principal Investigator: Tim Maloney

Date of Application: July 1, 2010

(***Updated*** *from May 19, 2010 application*)

Amount of Request: $873,300

Total Amount of Project: $2,108,200

Duration of Project: 12 months

Point of Contact (POC): Tim Maloney

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POC Address: 1521 Green Oak Place # 197, Kingwood TX 77339

TABLE OF CONTENTS

ABSTRACT

Objective:

The "Wellhead Gas Capture Via CNG Technologies" project will evaluate the viability of applying compressed natural gas (CNG) technologies to economically capture and transport produced natural gas and gas liquids to market. Doing so will achieve the following objectives:

- Capture a valuable resource from wells where no pipelines currently exist.
- Significantly reduce flaring of gas and gas liquids.
- Increase the economic viability and reserves of Bakken/Three Forks development.

The potential impact of applying this technology is to enable producers to capture the natural gas from all wells, whether or not a gas gathering system is in place, right from the date of initial oil production.

Expected Results:

1. Establish a wellhead gas capture system on five (5) Bakken wells. Also setup a transport operation for both CNG and NGLs, and a discharge facility to deliver lean gas and NGLs to market.
2. Demonstrate to producers (and mineral owners) the economic viability of capturing and transporting wellhead gas.
3. Reduce flaring of associated gas and gas liquids at Bakken and Three Forks wells, especially during the early months when flow rates are highest.

Duration: 12 months

Total Project Cost: $2.1 million

Participants: Bakken Express, LLC

PROJECT DESCRIPTION

Objectives:

The "Wellhead Gas Capture Via CNG Technologies" project will evaluate the viability of applying compressed natural gas (CNG) technologies to economically capture and transport produced natural gas and gas liquids to market. Doing so will achieve the following objectives:

- Capture a valuable resource from wells where no pipelines currently exist.
- Significantly reduce flaring of gas and gas liquids.
- Increase the economic viability and reserves of Bakken/Three Forks development.

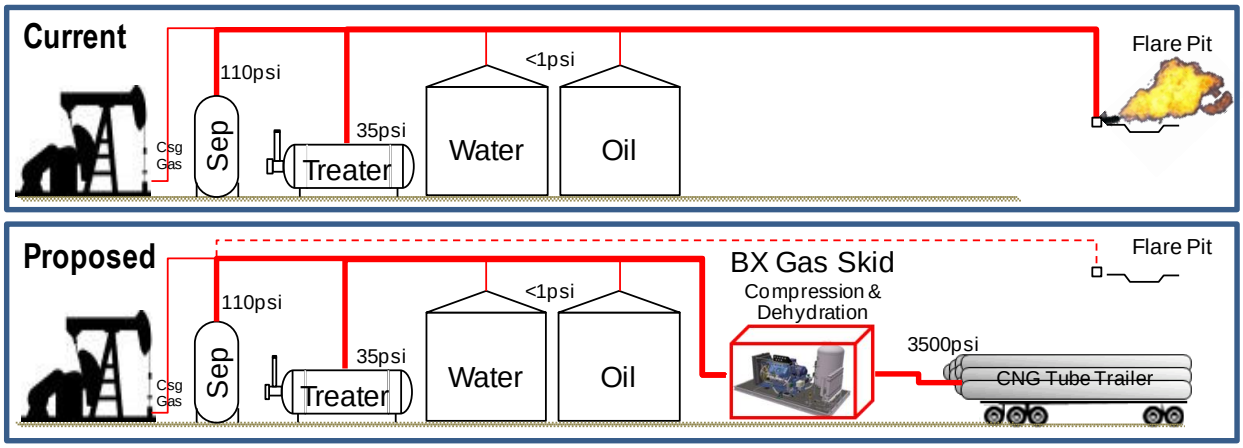
The potential impact of applying this technology is to enable producers to capture the natural gas from all wells, whether or not a gas gathering system is in place, right from the date of initial oil production.

Bakken gas is loaded with liquids, so its value is considerably higher than dry gas. In most areas it has a liquid content of 12 gpm, which means its value is often double the value of residue gas. For example, when residue gas is $4.00/MMBTU and NGL is $1/gal, wet Bakken gas is worth $9.00/MCF. Of course, the gas gatherers and gas plants extract a good portion of this, but even still, it can be sold to them for $4-6 per MCF.

Given these market values of gas and NGLs, the project will ascertain whether the "all-in" costs to capture and transport wellhead gas via CNG technologies are economically attractive to both the producer and service providers. The costs include investments in compressor skids and tube trailers (about $1 million per well), a discharge facility and the expenses for operators, maintenance, yard operations and trucking.

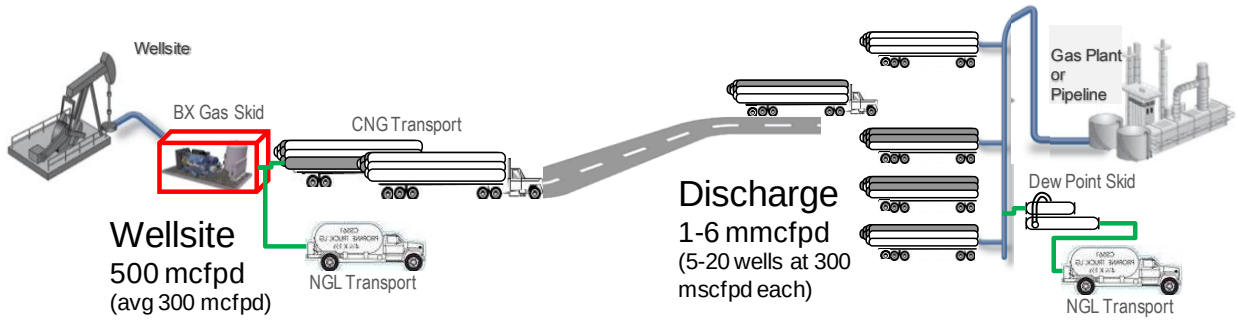
Methodology:

The following diagram depicts the basic methodology proposed for capturing and transporting the gas streams at the wellsite.



The compressor skid boosts the pressure from 15 psig to 3,500 psig, which enables the tube trailer to carry 210mcf per load. A well making 500 mcfpd would require about 3 loads a day. The gas will be dehydrated to under 0.5 lb/mmcf water content before being transported by CNG tube trailers.

When a tube trailer is nearing its maximum capacity, a truck is dispatched with an empty tube trailer. The empty is set in position next to the compressor skid and is hooked up to the manifold. Then, the full tube trailer is disconnected and taken to the discharge facility, which is located adjacent to a gas gathering or sales gas pipeline, as shown here.



At the discharge point the tube trailers are dropped off and connected to a manifold. The tubes are depressurized and drained through a discharge facility. Gas is sold to a gas gatherer or pipeliner.

At both the wellsite and the discharge locations NGLs are captured in standard propane bullet trucks and transported to sales points.

Anticipated Results:

1. Establish a wellhead gas capture system on five (5) Bakken wells. Also establish a transport operation for both CNG and NGLs, and a discharge facility to deliver lean gas and NGLs to market.

2. Demonstrate to producers (and mineral owners) the economic viability of capturing and transporting wellhead gas via CNG technologies.

   The goal is a fee structure for a wellhead gas capture service that might look something like:

MCFPD	400-500	300-400	200-300	100-200
Fee/Day	$700	$700	$700	$700
Fee/MCF	$1.56	$2.00	$2.80	$4.67

   To apply this to a realistic example, on a well with an IP of 1,050 bopd and 600 mcfpd, these technologies should capture 129 million scf of lean gas and 15,700 bbls of liquids in the first 12 months. Assuming a service fee of $700/day, gas values of $3.50/mcf and NGL values of $0.80/gal, this operation should be economic for both the service provider and the producer (who would net $525,000 [or $3.67/mcf], after transport costs, in the first year).

3. Reduce flaring of associated gas and gas liquids from Bakken and Three Forks wells, especially during the early months when flow rates are highest.

Facilities:

Two key technologies are the CNG compressors and the CNG tube trailers.

CNG compressors are well suited to this low volume, high compression ratio service. Most commonly they are 4 or 5 stage reciprocating compressors. Over the past 10 years these have started becoming much more standardized (and less costly) as the CNG market has grown worldwide. This key idea is to leverage these standardized, lower cost compressors from the CNG market over into the oil patch.

CNG tube trailers have also been in operation for many years. The technologies were largely developed for other gases (air, hydrogen, helium, nitrogen), but compressed natural gas really got started in a big way in the 1980's when alternative fuels were incentivized. These are highly regulated by DOT and have continued to grow in tube capacities. The leading technology is still Type 1 3AAX steel tubes, which is covered by DOT special permit 8009. CNG tube trailers are pulled by standard truck tractors.

CNG Compressor

CNG TubeTrailer

In addition to the CNG compressors and tube trailers, there will be additional facilities required to dehydrate gas to 0.5 lb/mmcf water content (using molecular sieve technology), high pressure quick connect/disconnect (using CNG hoses) and the discharge facility to depressurize the tube trailers and dew point the gas.

Resources:

The critical manpower will be the mechanics needed to support the operation of the compressors and the drivers to transport the tube trailers. During the project these manpower needs will be provided by qualified consultants and trucking service companies, under the supervision of experienced supervisors.

Bakken Express, LLC will set up a ND headquarters in Bismarck. In addition, there will be small field offices located at each of the yard facilities.

Techniques to Be Used, Their Availability and Capability:

The CNG compressor skids and CNG tube trailers are manufactured by multiple vendors. Four compressor manufacturers have been engaged so far for budgetary cost estimates and preliminary design discussions. Three tube trailer companies have been engaged so far as well. In addition, technical discussions and budget cost estimates have been obtained for other key equipment and services, including: dehydration equipment (membranes, regenerative dryers, non-regenerative dessicants), dew point skids (JT and refrig systems), trucking, construction and regulatory/administrative services.

Upon successful funding, rigorous tendering of equipment procurement and services will be followed.

Environmental and Economic Impacts while Project is Underway:

Construction at the well locations will have minimal environmental impact since the compressor skid and tube trailers will be sited on the main scoria pad near the existing permanent tanks. There will be some re-grading required, along with trenching for piping. There may be short shut-in periods during this construction, but well downtime will be minimal.

Construction at the discharge location will entail some re-grading, trenching and piping work, though much of the facility will be trailer mounted.

The project involves significant truck traffic on both unpaved and paved roads.

Safety will be a high priority during the project as well. Following are some of the high level safety and regulatory considerations that will be incorporated during the project:

- Overall Operation
    - Bakken Express Safety Program
- Wellsite Operation
    - Compressor skids are intrinsically safe.
    - Standard high pressure tube connect/disconnect.
- Transport Operation
    - CNG 3AAX tube trailer follow DOT SP 8009.
- Discharge Facility Operation
    - Manned yard operation.

Ultimate Technological and Economic Impacts:

1. Capture Value of Produced Gas and Gas Liquids

    a. Bakken gas is loaded with liquids, so its value is considerably higher than dry gas. In most areas it has a liquid content of 12 gpm, which means its value is often double the

value of residue gas. For example, when residue gas is $4.00/MMBTU and NGL is $1/gal, wet Bakken gas is worth $9.00/MCF. Of course, the gas gatherers and gas plants extract a good portion of this, but even still, it can be sold to them for $4-6 per MCF.

2. Reduce gas and liquids flaring at well locations.
3. Add bookable reserves for gas and gas liquids.

Why the Project is Needed:

Getting the first company to try something new is difficult. The OGRC project is needed to prove the viability of the approach on a good cross section of well types. Once demonstrated, operators will have the economic basis they need to sell it internally.

STANDARDS OF SUCCESS

- Execution Measures
    - Establish a wellhead gas capture system on five (5) Bakken wells.
        - Setup a transport operation for both CNG and NGLs.
        - Setup a discharge facility to deliver lean gas and NGLs to market.
        - Capture and transport approximately 2500 mcfpd from 5 wells.
    - Execute project on time and within budget.
    - Execute the construction and operation work with zero significant spills and a recordable incident rate (TRIR) below 1.0 (first quartile performance).
    - Deliver interim and final reports to NDIC/OGRC according to timeline, and notify all parties of material deviations from approved work plans.
- North Dakota Value Measures
    - In order to improve the economics of Bakken wells, and promote development of even the marginal areas:
        - Evaluate CNG technologies to economically capture and transport wellhead gas to market.
    - Reduce flaring at Bakken and Three Forks wells, especially during early high rate period.
    - Bring new technologies into North Dakota: CNG compressors and CNG tube trailers.
    - Encourage other operators and service providers to adopt this approach to extend the benefits broadly.
    - Create jobs, both during execution of project scopes, and afterwards as business continues to grow.

BACKGROUND/QUALIFICIATIONS

Tim Maloney

Extensive experience in oilfield engineering and operations, in U.S. and internationally, with Chevron and Hess Corporation. Particularly strong in engineering solutions related to production operations, metering, fluid separation and processing, well completions and field development. Deeply involved with Bakken development while working for Hess, first, as North Dakota Operations Manager & Bakken Project Manager, 2005-7, in Williston, ND, and then as Director of Operations, 2008-2010. At Hess, provided leadership in a number of areas, including specifically, fluid transportation and oil export, in support of the company's Bakken development. Also at Hess, provided leadership over the bulk of the 2005-2009 hiring program, adding over 120 employees to the North Dakota construction and operations groups.

At Chevron, Tim held a number of technical leadership and operational management positions. Specifically managed several similar projects, applying new technologies to operational problems, in related areas, like: oil metering, rail transport, portable test facilities and facility optimization. Education: B.S. Engineering Geology, M.S. Petroleum Engineering.

Jim Paul

Broad experience across several energy activities including oil and gas production, refining, coal mining, natural gas transmission, energy marketing, and power generation. Served as president and CEO of The Coastal Corp. Chairman of American Natural Resources Company. Also served as Chairman of Great Lakes Transmission Company, which was owned 50/50 with TransCanada Pipelines. Served as Director and Chairman of the Audit Committee of Louis Dreyfus Natural Gas Corp., an independent energy company engaged in the acquisition, development and production of natural gas & oil.

Early in his career, Jim also served as Financial Officer of a specialty motor company of liquid and dry bulk commodities. Also served as Director and member of the Audit Committee and the Governance Committee of TransCanada Pipelines, a leading transporter and marketer of natural gas in North America. Education: B.S. Business Administration.

MANAGEMENT

The project will be managed by Bakken Express, LLC, a new company founded by Tim Maloney and Jim Paul. The vision behind the company is to apply innovative technologies and lean practices to deliver highly efficient operational solutions to Bakken producers. A Williston based Ops Mgr will support Tim and Jim in overseeing the implementation of technical and construction work. Each major segment of work will be packaged into well defined scopes of work and each will be bid out to 2-3 companies on a turnkey basis.

Each scope of work will follow this management process: 1) clearly define scope, 2) scan marketplace & select best contracting option, 3) bid and award, 4) oversee execution and 5) lookback and lessons-learned. An audit function will ensure compliance with good accounting and controls.

The Timeline indicates the planned Interim and Final Reports to the NDIC/OGRC. These are timed to coincide with key decision points on the major scopes of work, when possible. Also, there will be a Monthly Report that provides a high level status of each scope of work.

Following are the major scopes of work. Also shown is the Lead Investigator for each work scope.

Capital Funding – Initial capitalization was provided by founders. Additional funding will be sought through grants, contract financing and collateral bank loans. [Lead – Jim Paul]

Sales (Sign Up Producers) – Have already identified one producer in concept. [Lead – Tim Maloney]

Operations – Will contract the mechanic, operator and truck drivers. [Lead – Ops Mgr]

Equipment Purchase & Lease – Have already started working with tube trailer and CNG compressor providers, as well as, bankers in North Dakota that specialize in equipment loans/leases. [Lead – Jim Paul]

Discharge Facility – Will address early in project scope. [Lead – Ops Mgr]

Wellsite Modifications – The modifications to the wellsites won't be significant, but will need to be managed efficiently and will need some customization for each site. [Lead – Ops Mgr]

Permitting – Have already had discussions with a consulting firm in Williston. [Lead – Tim Maloney]

TIMETABLE

Following is the timeline to implement the project:

	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12
Secure funding & setup controls												
Secure producers and gas gatherer for 5 well project area.												
Prepare bid packages (compressor package, tube trailers, discharge facility, truck).												
Award compressor package and tube trailers.												
Award discharge facility contract.												
Issue Interim Report to NDIC/OGRC.												
Receive 1st compressor package and tube trailers. Complete setup of discharge facility.												
Initiate gas capture at first well location.												
Issue Interim Report to NDIC/OGRC.												
Receive remaining compressor packages and tube trailers.												
Initiate gas capture at remaining well locations.												
Issue Interim Report to NDIC/OGRC.												
Streamline operation and make modifications as necessary. Reach full capacity with 5 compressor sets.												
Issue Final Report to NDIC/OGRC.												

BUDGET

Request for $873,300 NDIC OGRP funding; Total Project Cost: $2,108,200

WELLSITE GAS CAPTURE & TRANSPORT										
12 Month Project: Capture & Transport Gas from 5 Wells with Peak Rate 2500 mcfpd										
Expense Type	**Total**	**NDIC**	**%**	**BX Cash**	**%**	**BX In-Kind**	**%**	**Other**	**%**	**%**
Well Skids Capital	$ 1,500,000	$ 750,000	50%	$ 750,000	50%	$ -	0%	$ -	0%	100%
Tube Trailer Leasing	$ 220,000	$ 110,000	50%	$ 110,000	50%	$ -	0%	$ -	0%	100%
Discharge Facility Leasing	$ 26,600	$ 13,300	50%	$ 13,300	50%	$ -	0%	$ -	0%	100%
Operator & Maintenance	$ 69,400	$ -	0%	$ 69,400	100%	$ -	0%	$ -	0%	100%
Supervisory, Engineering and Mgmt Consult	$ 61,800	$ -	0%	$ 61,800	100%	$ -	0%	$ -	0%	100%
Principals	$ 230,400	$ -	0%	$ -	0%	$ 230,400	100%	$ -	0%	100%
TOTAL	$ 2,108,200	$ 873,300	41%	$ 1,004,500	48%	$ 230,400	11%	$ -	0%	

Bakken Express, LLC will secure their portion of funding ($1,004k in cash, $230k in-kind) through contract financing and collateral bank loans.

The capital investment is the well compression/dehydration skids. The CNG tube trailers and discharge facility can be leased for a 12 month term.

CONFIDENTIAL INFORMATION

There is no confidential information in the application.

PATENTS/RIGHTS TO TECHNICAL DATA

There are no patents or rights to technical data that need to be reserved in the application.

STATUS OF ONGOING PROJECTS (IF ANY)

The applicant has no previous projects or funding from the Commission.

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July 1, 2010

North Dakota Industrial Commission
ATTN: Oil and Gas Research Program
State Capitol – Fourteenth Floor
600 East Boulevard
Bismarck, North Dakota 58505

Re: Transmittal Letter for OGRC Grant Application by Bakken Express for Project "Wellhead Gas Capture Via CNG Technologies"

Dear Sir or Madam:

Bakken Express, LLC is a new company that has been formed by two industry veterans, Tim Maloney and Jim Paul. These two founders have strong, complementary backgrounds in both oilfield operations and petroleum transportation. Tim also brings to the venture his recent experience in the Bakken as Director of Operations for Hess Corporation. The vision behind this new company is to apply innovative technologies and lean practices to deliver highly efficient operational solutions to Bakken producers.

Bakken Express is seeking a grant from the Oil and Gas Research Council for a portion of the cost to pilot the technical feasibility and commercial viability of new technologies that will capture and transport to market the gas and gas liquids from Bakken / Three Forks wells. Bakken Express would use the grant to leverage additional funds from companies in order to secure the full remaining cost of the project. Bakken Express commits to completing the project described in the attached grant application, contingent upon receiving the matching funding from companies. If we are unsuccessful in our efforts to raise the remaining 59% of matching funds for the project, we would decline the OGRC funding. However, we are confident that we will be able to leverage the grant to secure the matching funds from industry and investors.

Thank you for considering our grant application. Please contact Bakken Express Manager, Tim Maloney, at (832) 429-4508 or tmaloney@bakkenexpress.com, with any questions or requests for clarification.

Sincerely,

Jim Paul, Manager, Bakken Express, LLC

Affidavit of Tax Liability

Bakken Express, LLC does not have any outstanding tax liability owed to the State of North Dakota or any of its political subdivisions.

Jim Paul
Manager

5/18/10
Date