

March 1st, 2022

North Dakota Industrial Commission
State Capitol – Fourteenth Floor
600 East Boulevard Avenue
Bismarck, ND 58505

To Whom it May Concern,

Re: Enerplus CSEA grant application “Internal Combustion Engine Carbon Capture and Sequestration”

On behalf of Enerplus Resources (USA) Corporation, I submit the referenced grant application for consideration by the Clean Sustainable Energy Authority. We request a grant match of \$9,055,000 for the proposed project, with a total duration 38 months. Enerplus commits to match the granted funds to complete the body of work described in our proposal for a total project proposal cost of \$18,110,000.

We propose to develop a carbon capture and sequestration project (“CCS Hub”) with the capability to drastically reduce greenhouse gas emissions from our operations. Our project will involve the installation of facilities to capture carbon from generator engine exhaust, development of an injection well permitted for carbon sequestration, and transport of captured carbon from the engines to our sequestration well. We expect up to a 90% reduction in emissions from target generators by the end of the project duration. Successful reduction in emissions associated with this project will provide proof on concept that can lead to field-wide deployment with the potential to reduce 90% of Enerplus’ stationary combustion Scope 1 CO₂e emissions. Reducing emissions aligns with the State of North Dakota’s leadership position in developing sustainable energy practices, equipment, and technologies.

Sincerely,



Wade Hutchings
Chief Operating Officer

Clean Sustainable Energy Authority

North Dakota Industrial Commission

Application

**Project Title: Internal Combustion Engine
Carbon Capture and Sequestration**

**Applicant: Enerplus Resources (USA)
Corporation**

Date of Application: March 1, 2022

**Amount of Request
Grant: \$9,055,000
Loan: \$0**

**Total Amount of Proposed Project:
\$18,110,000**

Duration of Project: 38 months

Point of Contact (POC): Bonnie Ellwood

POC Telephone: (720) 289-5939

POC Email: bellwood@enerplus.com

**POC Address: 950 17th Street, Suite 2200
Denver, CO 80202**

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ABSTRACT

Objective:

Enerplus Resources (USA) Corporation (“Enerplus”) is an independent North American oil and gas exploration and production company – operating on and around the Fort Berthold Indian Reservation – focused on creating long-term value for its shareholders through a disciplined, returns-based capital allocation strategy and a commitment to safe and responsible operations. Enerplus is committed to reducing Green House Gas (“GHG”) emissions, to complying with stated corporate Environmental, Social and Governance (“ESG”) goals, and to supporting the objectives of the State of North Dakota to be carbon neutral by 2030. To advance towards our mutual goals, Enerplus proposes to implement a fieldwide carbon capture and sequestration project (“Enerplus CCS Hub”) that will reduce the Greenhouse Gas emissions from its operations.

Currently, new well pads use temporary generators powered by produced gas when grid power is inadequate or unavailable. Stationary combustion sources account for 25% of Enerplus’ corporate GHG emissions in the Williston Basin. Enerplus is partnering with Power Kinetic Networks (“PKN”) who has designed, engineered, and will construct a portable, scalable carbon capture facility. PKN’s carbon capture facilities use proprietary technology to collect exhaust gas emitted from stationary internal combustion engines. These facilities, if successfully deployed at scale, have the potential to significantly reduce GHG emissions in the Williston Basin.

The objective of this project is to establish an Enerplus CCS Hub with the following components:

- Two facilities (Gemini Facilities #1 and #2) that collect exhaust gas from temporary generator units located on multi-well pads.
- Infrastructure to transport carbon dioxide (“CO₂”) recovered from exhaust gas to a central sequestration hub.
- Disposal of CO₂ at the central sequestration hub in an approved Class VI injection well.

Goals of the proposed project are designed to allow for commercial scale carbon capture technologies and operations, with an anticipated fieldwide GHG emission reduction program initiated in approximately three years. Enerplus is requesting North Dakota Sustainable Clean Energy Authority (“CSEA”) grant funds for the entirety of this project but is proposing three distinct phases of funding. We propose that financing for each phase be reliant upon the success of the previous stage after Stage 1 (described in detail in the **Methodology** section of the **PROJECT DESCRIPTION**).

To our knowledge, this is the first time a carbon capture solution has been tested for small-scale sources targeting the oil and gas industry. Reduction of GHG emissions through the proposed project provides a range of benefits to the State of North Dakota, including the following points:

- Demonstrating that oil & gas companies operating within the state can successfully and meaningfully reduce the environmental impact of their operations, which improves the sustainability of the state’s oil and gas production.

- Contributes to establishing North Dakota’s position as a leader in developing carbon capture and sequestration and promoting clean and sustainable energy practices, equipment, and technologies.
- Developing a competitive advantage for the state with low carbon intensity energy that will provide access to preferred and premium markets, which has the potential to grow the state’s economy.

Expected Results:

The current design of the Enerplus CCS Hub is expected to result in:

- Up to a 90% reduction in GHG emissions of 4 temporary generator units located on multi-well pads by deploying two Gemini Facilities capable of capturing exhaust gas.
- An operational Class VI CO₂ injection well for permanent geologic sequestration of captured CO₂. Emissions captured using the Gemini Facilities will be injected into the well. The injection well will have capacity for greater volumes of CO₂.
- A commercial CCS hub with the capability for increasing the scale of GHG emission capture to a fieldwide operation.

Total Project Cost and Duration:

In this submission, Enerplus is seeking funding from the North Dakota Sustainable Clean Energy Authority for our CCS Hub. We anticipate this project to be completed within 38 months, with an expected budget of \$18,110,000. Enerplus is requesting a grant in the amount of \$9,055,000 (50% of the budgeted costs).

Participants:

The main participant is Enerplus as the site operator and owner of emissions reduced by the project. Enerplus will be working with PKN for the well pad carbon capture equipment and CO₂ transport logistics. Enerplus will undertake an assessment of potential sequestration reservoirs and the design, drilling, and completion of the associated injection well. Enerplus will be responsible for the operation of the CCS Hub facilities and injection well.

Our continued relationship with the Mandan Hidatsa Arikara (“MHA”) Nation and the Energy & Environmental Research Center of North Dakota are important factors to the project’s success. On February 22, 2022, Enerplus received an email in support of this proposed project from Kenny Lyson, Director of the MHA Nation. The email states in whole, “I have reviewed Enerplus’ CO₂ emissions lowering plan. MHA Energy would like to commend Enerplus on their commitment to lowering emissions and flaring. MHA Energy supports and looks forward to seeing the results of this plan. Again thanks for your continued efforts.” Enerplus is currently working with the MHA Nation to receive a Letter of Support that is intended to supplement this application at a later date.

PROJECT DESCRIPTION

Objectives:

- Establish an Enerplus CCS Hub in the Williston Basin. The proposed Hub will consist of both small-scale carbon capture technology and an injection well. An operational sequestration hub will provide a foundation for potential future projects involving the disposal of CO₂ captured from additional sources of emissions including compressors, heaters, drilling operations, and completions operations.
- Successful deployment of small-scale carbon capture technology from proof of concept through commercialization. We aim to accomplish this objective by using an innovative, modular carbon capture technology developed by PKN.
- Establish infrastructure for transporting captured CO₂ to our injection well. Trucks will transport captured carbon from the Gemini Facilities to the injection well once the well is fully operational.
- Successfully design, permit, build, and operate an approved injection well for disposal of CO₂. The injection well will sequester CO₂ captured from our small-scale carbon capture technology with the capacity to sequester CO₂ captured from additional sources.
- Contribute to establishing the state of North Dakota as a leader in carbon capture and sequestration. Successful implementation of our CCS Hub will demonstrate that oil & gas companies operating in North Dakota can successfully and meaningfully reduce the environmental impact of their operations.

Methodology:

The project is designed to take carbon capture technology from demonstration to commercialization in conjunction with carbon sequestration. Enerplus is requesting North Dakota Clean Sustainable Energy Authority (“CSEA”) grant funds for the entirety of this effort through three distinct phases toward full carbon sequestration. Each phase will be reliant upon the success of the previous stage for further financial commitments.

Stage 1 - The goal of Stage 1 is to commission and install Gemini Facility #1 on one internal combustion engine on one of our operated pads within the Williston Basin. In addition, Enerplus will initiate an application process for approval to drill, complete and operate a CO₂ injection well in the Williston Basin. In Stage 1, Enerplus is requesting CSEA grant funds for the Gemini Facility #1 rental fee and all legal, consulting, engineering, and application fees to permit the injection well. Enerplus anticipates results from the Gemini Facility portion of Stage 1 will be determined within 15 months of the CSEA grant award, which includes an eight- to ten-month lead-time to construct and deliver the Gemini Facility #1.

Stage 2 – Upon success of Stage 1, Enerplus will relocate Gemini Facility #1 to capture carbon from four internal combustion engines on one of our operated pads within the Williston Basin. In Stage 2, Enerplus is requesting CSEA grant funds for mobilization and continued lease of Gemini Facility #1 and ongoing legal, consulting, engineering, and application fees to permit the injection well. Enerplus anticipates success of Stage 2 will be determined within four months of completion of Stage 1. Successful implementation of Gemini Facility #1 will lead to development of additional

Facilities, with an anticipated fieldwide GHG emission reduction program initiated in approximately three years.

Stage 3 – Upon success of Stage 2, Enerplus will order an additional Gemini Facility (Gemini Facility #2) to capture carbon from four additional internal combustion engines at a different Enerplus operated pad within the Williston Basin. In Stage 3, Enerplus is requesting CSEA grant funds for rental fees of two Gemini Facilities continuing to the end of the two-year operation period for Gemini Facility #1 and a one-year operation period for Gemini Facility #2. Following receipt of all necessary permits and approvals for the injection well, Enerplus will drill the injection well and begin sequestration of the liquified CO₂ generated from the Gemini Facilities. Successful demonstration of Stage 3 will prove scalability of the Facilities and will provide a blueprint for future expansion of the Gemini Facilities for other emissions sources, including exhaust emissions from compressors, additional generators, rigs, and completions operations.

Anticipated Results:

Anticipated results include meaningful emission reductions, proving untested carbon capture technology, and the development of a critical carbon sequestration hub in North Dakota.

The Gemini Facility is designed to remove up to 90% of Scope 1 CO₂e emissions from internal combustion engine exhaust and produce a liquified CO₂ product for utilization or sequestration. The injection well is anticipated to be developed to match the requirements of the carbon capture facilities. As the sequestration site nears operational status, Enerplus will assess the feasibility of recovering CO₂ from other emission sources including compressors, heaters and potentially drilling and completion operations. Until the proposed injection well is fully operational, Enerplus will be investigating temporary markets for our liquified CO₂, prioritizing sequestration over enhanced oil recovery.

The estimated annual GHG emission reductions of this project are shown below in Table 1. As the technology is implemented, the efficiency of the system will continue to increase through process improvements. PKN is targeting an ultimate carbon capture efficiency of 90%.

Table 1. Metric Tonnes CO₂/yr Reductions

	Stage 1 1 Engine	Stage 2 4 Engines	Stage 3 Gemini Facility #1 & 2	Fieldwide Enerplus Commercialization
mtCO ₂ /yr	2,215	8,500	18,000	235,000
Efficiency	75%	75%	80%	90%

Facilities:

The proposed Enerplus CCS Hub project will consist of well pad carbon capture facilities and a central sequestration site to support its operations.

Well Pad Carbon Capture Facilities:

At each designated well site, a portable, modular carbon capture facility will be installed to reduce the GHG emissions from temporary generators. Enerplus will be using two Gemini Facilities provided by PKN. PKN has developed a proprietary carbon capture process that features a low environmental impact with no treating chemicals or noxious emissions. A supervisory control and management system will be installed with each Gemini facility to ensure safe, efficient, and reliable operation of the equipment - with collected data relayed to both Enerplus and PKN personnel. Additional details on PKN Gemini carbon capture technologies are provided in Appendix B (*Confidential*). As the proposed project progresses, the facility design will be scaled up to capture 90% of the GHG emissions from the well pad temporary generators.

PKN will provide portable, modular CO₂ storage and truck loading equipment for liquified CO₂ transport. Initially, the liquefied CO₂ will be shipped to existing sequestration or enhanced oil recovery facilities that are located near Enerplus operations. When the CCS Hub sequestration site becomes fully operational, the liquified CO₂ will be trucked to the injection well for sequestration.

Enerplus CCS Hub Facilities:

Enerplus plans to operate a liquified CO₂ receipt and injection facility at the sequestration site. The facility will receive and store liquefied CO₂ delivered by truck. The injection facility will draw liquified CO₂ from onsite storage and inject the liquified CO₂ downhole at sufficient pressures into the approved underground storage reservoir(s).

Operations of the overall CCS Hub will be overseen by a supervisory control and management system. The management system will also be able to monitor the operation of the Gemini Facilities deployed throughout Enerplus operations. This will be used to coordinate and schedule the storage and transport of the liquified CO₂, adding to the safe and efficient overall operation of the CCS Hub Facilities.

Enerplus anticipates that the CCS Hub will be expanded as further GHG emission reduction programs are undertaken across our North Dakota operations. This may include carbon capture on other emission sources including compressors, heaters, and potentially drilling and completion operations. This may result in expansion of the CCS Hub with additional injection wells, receipt and storage facilities, and CO₂ injection equipment.

Resources:

Enerplus plans to utilize a range of resources to execute the proposed CCS Hub. In-house personnel developing this project include: an assigned technical team of geologists, geophysicists, engineers, scientists, project managers, business analysts, landmen and legal experts; field operations and safety personnel; and other support staff as required. In addition, Enerplus expects to engage topic specific expertise, including consultants, to assist with the unique aspects of permitting and operating CO₂ sequestration facilities.

Techniques to be used, their availability, and capability:

For the well pad carbon capture equipment, Enerplus will be using PKN's proprietary Gemini Facility carbon capture system. The technologies that PKN will incorporate in the Gemini Facilities have been proven in many industrial settings (coal and natural gas power facilities, refineries, petrochemical facilities, and oil and gas operations) and feature low environmental impacts. For this application, the PKN Gemini Facility has been designed as a portable, modular unit that can be easily relocated as necessary.

PKN has developed relationships with key equipment suppliers that will be used in the proposed project. The balance of the equipment can be obtained from a range of manufacturers, suppliers, fabricators, and installers on a competitive bid basis.

Enerplus, as an active developer and oil producer in North Dakota, will use existing local suppliers, contractors and procurement chains for equipment associated with the injection well of this proposed project. The unique aspects of CO₂ sequestration are entirely within the existing capabilities of the company and its contractors.

Environmental and Economic Impacts while the Project is Underway:

Each Gemini Facility will occupy Enerplus' existing pads with no additional footprint required. The injection well will require a short lease road and a ten-acre pad constructed for drilling. Upon completion of commissioning the injection well, this pad, through interim reclamation, will be reduced to five acres.

Successful operation will rely upon trucking liquified CO₂ and maintaining the injection well, which will support the local economy. If Enerplus is able to permit the injection well allowing other operators in the Williston Basin to also sequester CO₂, the opportunity for positive economic impacts to the community could grow exponentially.

Ultimate Technological and Economic Impacts:

The Gemini Facility is a first of its kind, small-scale portable carbon capture technology. If proven successful, the Gemini Facility technology could have a significant impact on the oil and gas industry in North Dakota. Commercialization of this technology has the potential to help North Dakota become a leader in carbon capture and sequestration for the oil and gas industry. Potential federal carbon regulation can be managed with carbon capture and sequestration, such as the Gemini Facility, supporting the continued production of oil and gas from the Williston Basin.

Why the Project is Needed:

Stationary internal combustion engines (generators) are the second largest contributor to Enerplus' US reportable emissions and are a necessary component of oil and gas production, powering instrumentation and artificial lift. Artificial lift is necessary to move the hydrocarbons up wellbores to the surface. Where pads are not electrified through grid power, generators are utilized. Presently, the majority of Enerplus pads operate with generators. While electrification of pads reduces Scope 1 carbon emissions, it merely pushes the emission generation to Scope 2 carbon emissions with minimal overall net emissions benefit.

Providing carbon capture on generators will improve the sustainability of continued oil and gas production, which is critical to the future of the state of North Dakota. Proving this type of carbon capture will help demonstrate the State's leadership and efforts in reducing its carbon intensity footprint.

STANDARDS OF SUCCESS

Emissions reduction

The initial standard of success is reliant upon the successful operation of the Gemini Facility and an ability to increase carbon capture efficiencies in the second and subsequent engineering designs. Enerplus anticipates capturing 18,000 mtCO₂e/year through the end of the stages identified in this application. However, the injection well creates opportunity for more opportunity for carbon sequestration over the life of the well.

Reduced environmental impacts

Direct carbon capture and sequestration of carbon emissions from critical oil and gas carbon sources could have a significant step change impact for the oil and gas industry in North Dakota.

Increased energy sustainability

By proving the feasibility of the proposed carbon capture technology and commissioning one of the first CO₂ injection wells operated by an oil & gas operator in the Williston Basin, Enerplus continues its mission to be known as an energy sustainability leader. If successful, oil and gas production in the Williston Basin can continue with the lowest carbon intensity footprint for an oil and gas play across the globe.

Value to North Dakota

With success, the Gemini Facility provides a path for decarbonization with other Williston Basin oil and gas operators. Expansion of the PKN Gemini technologies to other operators and applications would promote investment and job creation in the State. Steps to reduce the carbon intensity of Williston Basin oil and gas production benefit the State and its residents, and supports Environmental Justice for the people of the MHA Nation.

Explanation of how the public and private sector will make use of the project's results, and when and in what way.

While the design of the Gemini Facility will remain proprietary, this carbon capture solution is not exclusive to Enerplus. The results of the Gemini Facility performance will be shared with CSEA. If successful, other operators in the Williston Basin will have the opportunity to utilize these technologies.

The potential commercialization of the project's results.

Enerplus intends to assess full commercialization of the Gemini Facility for all combustion emission sources.

How the project will enhance the research, development and technologies that reduce environmental impacts and increase sustainability of energy production and delivery of North Dakota's energy resources.

Valuable information will be gained by supporting demonstration projects in early stages targeting carbon capture. In addition, learnings will be developed from commissioning an injection well and will expand the knowledge base for other projects. While this project will begin as pilot operation with a research and development focus, the most valuable information will be gained by taking this project through to full commercialization.

How it will preserve existing jobs and create new ones.

Furthering emission reductions are a critical component of ensuring continued oil and gas production in the Williston Basin. Jobs will be created during construction, operation and maintenance of the Gemini Facility and drilling, completion and operation of the injection well. Newly created jobs include truck transport to haul, and unload captured CO₂. With commercialization, the job impacts could be material to the State. Support services across a range of supply chains will find new opportunities to support growing carbon capture and sequestration activities in the State.

How it will otherwise satisfy the purposes established in the mission of the Program.

The proposed project meets all standards of success set by the Clean Sustainable Energy Authority. With success, the proposed Enerplus CCS Hub will:

- reduce GHG emissions from current and future oil and gas operations
- decrease the environmental impacts associated with stationary engines
- provide a pathway for decarbonization of other equipment, applications, settings, and industries
- increase energy sustainability by reducing Scope 1 GHG emissions within oil and gas operations and produce lower carbon intensity fuel
- scale-up the PKN technologies to commercial levels to serve a wide cross-section of potential users
- attract carbon capture investments that will promote job creation in the State
- establish the State as a leader in supporting the development of clean energy technologies

BACKGROUND/QUALIFICATIONS

Enerplus will utilize highly skilled internal engineering and geology resources to direct all stages of an injection well with considerable expertise in large scale logistics, drilling, completions and facility design. Throughout Enerplus development within the Williston Basin, the company has successfully implemented several technologies to address greenhouse gas emissions, such as bitcoin mining and portable natural gas processing skids.

PKN's principals have a wide range of experience in the design and operation of oil and gas production facilities in Canada and the United States. Experience relevant to the proposed project includes oil production, treating, storage and transmission; solution gas facilities, compression and pipelines; power generation; sour gas treating; high pressure water and gas injection;

ethane/NGL processing and recovery, transmission, and storage; and hydrocarbon miscible floods.

For detailed design of the proposed facilities, PKN has partnered with Obsidian Engineering Ltd., a full-service engineering, procurement and construction firm that has executed a comprehensive range of oil and gas projects in North Dakota and Canada.

MANAGEMENT

Enerplus will rely on in-house project management expertise and software tools to ensure timelines and budgets are met.

Stage 1 Evaluation Plan

Stage 1 evaluation relies upon three key points:

1. The Gemini Facility operates with no significant backpressure in the single engine exhaust stack not to exceed engine manufacturer requirements.
2. The Gemini Facility is capable of a minimum capture efficiency of CO₂.
3. The Gemini Facility is able to meet a minimum operating time.

Stage 2 Evaluation Plan

Stage 2 evaluation relies upon four key points:

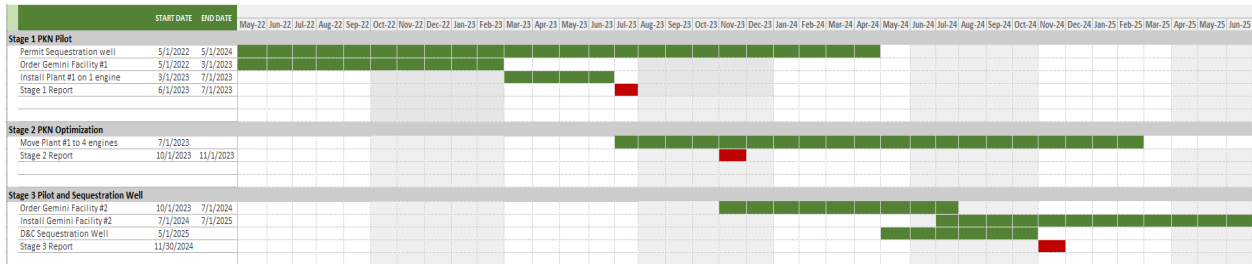
1. The Gemini Facility is able to capture carbon emissions from four operating engines simultaneously.
2. The Gemini Facility operates with no significant backpressure in the single engine exhaust stack not to exceed engine manufacturer requirements.
3. The Gemini Facility is capable of a minimum capture efficiency of CO₂.
4. The Gemini Facility is able to meet a minimum operating time.

Stage 3 Evaluation Plan

Stage 3 evaluation relies upon three key points:

1. Enerplus successfully secures a permit for an EPA Class VI injection well for permanent sequestration of CO₂.
2. Enerplus successfully secures a land lease at a geologically acceptable location for the injection well.
3. Economics and markets for commissioning and operating an injection well meet or exceed Enerplus cost of capital.

TIMETABLE



BUDGET

Project Associated Expense	NDIC Grant	NDIC Loan	Applicant's Share (Cash)	Other Project Sponsor's Share	Total
Gemini Facility Lease (2 Facilities for 3 years total) Stages 1-3	\$1,650,000	\$0	\$1,650,000	\$0	\$3,300,000
Injection Well Permitting Stage 1	\$100,000	\$0	\$100,000	\$0	\$200,000
Mobilization and installation of Gemini Facility (3 instances)	\$90,000	\$0	\$90,000	\$0	\$180,000
Injection Well Land Cost (1 year)	\$40,000	\$0	\$40,000	\$0	\$80,000
Injection Well Pad Construction	\$175,000	\$0	\$175,000	\$0	\$350,000
Injection Well Drilling	\$1,750,000	\$0	\$1,750,000	\$0	\$3,500,000
Injection Well Completions	\$750,000	\$0	\$750,000	\$0	\$1,500,000
Injection Well Facilities	\$4,500,000	\$0	\$4,500,000	\$0	\$9,000,000
Total	\$9,055,000	\$0	\$9,055,000	\$0	\$18,110,000

Lease rates of the Gemini Facilities are based on negotiations between Enerplus and PKN, additional project expenses are based on estimates prepared by Enerplus drilling, completions and facility engineers. Without CSEA funding, Enerplus would not move forward with this project.

CONFIDENTIAL INFORMATION

Enerplus has developed the project proposal along with PKN using a combination of confidential technical, commercial and financial information. Requests for the Commission to consider and maintain this information as confidential is provided in completed "Request for Confidentiality" forms in Appendix F.

PATENTS/RIGHTS TO TECHNICAL DATA

Please refer to Appendix F for the described intellectual property associated with this project proposal, including patents and rights to technical data.

STATE PROGRAMS AND INCENTIVES

Enerplus has not participated in any programs or incentives from the State within the last five years.

Appendix A
Tax Liability Statement

Industrial Commission

Tax Liability Statement

Applicant: *Enerplus Resources (USA) Corporation*

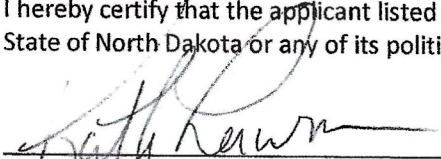
Application Title: *Internal Combustion Engine Carbon Capture and Sequestration*

Program:

- Lignite Research, Development and Marketing Program
- Renewable Energy Program
- Oil & Gas Research Program
- Clean Sustainable Energy Authority

Certification:

I hereby certify that the applicant listed above does not have any outstanding tax liability owed to the State of North Dakota or any of its political subdivisions.



Signature

**KATHY LAWRENCE
MANAGER, US ACCOUNTING**

Title

2/23/2002

Date

Appendix B

Business Plan

Appendix C
Enerplus Financial Statements

Appendix D

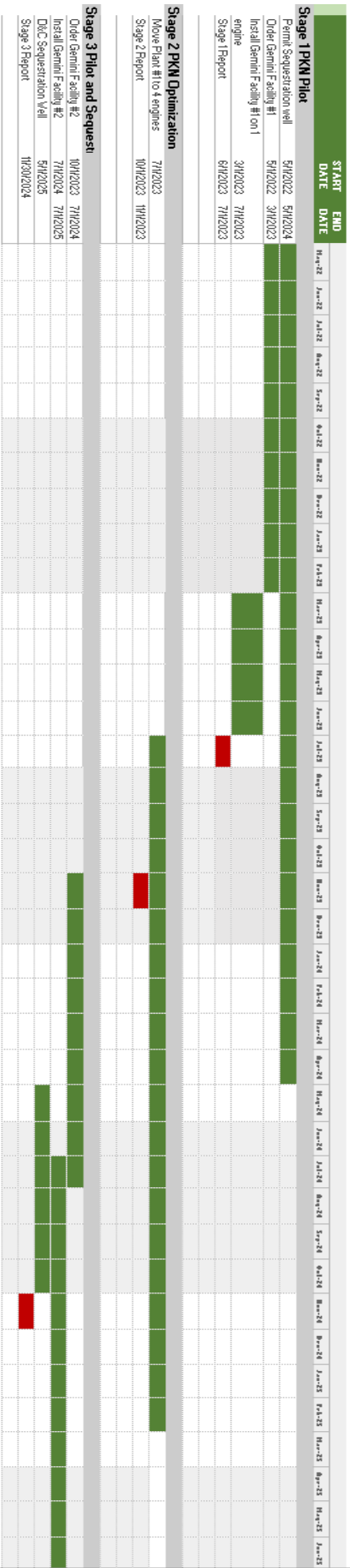
Budgeted Projections

Budgeted Projections

Project Associated Expense	NDIC Grant	NDIC Loan	Applicant's Share (Cash)	Other Project Sponsor's Share	Total
Gemini Facility Lease (2 Facilities for 3 years total) Stages 1-3	\$1,650,000	\$0	\$1,650,000	\$0	\$3,300,000
Injection Well Permitting Stage 1	\$100,000	\$0	\$100,000	\$0	\$200,000
Mobilization and installation of Gemini Facility (3 instances)	\$90,000	\$0	\$90,000	\$0	\$180,000
Injection Well Land Cost (1 year)	\$40,000	\$0	\$40,000	\$0	\$80,000
Injection Well Pad Construction	\$175,000	\$0	\$175,000	\$0	\$350,000
Injection Well Drilling	\$1,750,000	\$0	\$1,750,000	\$0	\$3,500,000
Injection Well Completions	\$750,000	\$0	\$750,000	\$0	\$1,500,000
Injection Well Facilities	\$4,500,000	\$0	\$4,500,000	\$0	\$9,000,000
Total	\$9,055,000	\$0	\$9,055,000	\$0	\$18,110,000

	Anticipated Timing	NDIC Grant	Applicant's Share (Cash)	Total
Stage 1 PKN Pilot	5/1/2022	\$890,000	\$890,000	\$1,910,000
Stage 2 PKN Optimization	7/1/2023	\$30,000	\$30,000	\$60,000
Stage 3 Pilot 2	10/1/2023	\$855,000	\$855,000	\$1,710,000
Stage 3 Sequestration Well	5/1/2025	\$7,215,000	\$7,215,000	\$14,430,000

CCUS Hub Gantt



Appendix E

PKN Corp Profile / Resumes – PKN Principals / Obsidian Corp Profile



Power Kinetic Networks – Gemini Carbon Capture Systems

Technology to Reduce Natural Gas GHG Emissions Through CO2 Recovery

CORPORATE PROFILE

Overview:

Power Kinetic Networks (“PKN”) was founded to provide cost effective CO2 solutions to a cross section of potential customers that include the: energy, processing, manufacturing, and power sectors; government agencies and institutions from civic to federal levels; and other end users of energy products. The Company has developed an innovative, advanced modular carbon capture system using proprietary Gemini technologies. These advanced, modular technologies assist users with:

- decarbonizing their operations and reducing their carbon footprint.
- reducing exposure to carbon taxes and related costs and/or generating GHG credits.
- providing competitive advantages with lower carbon inputs into end products.
- meeting Environmental, Social and Governance targets.

PKN Gemini Technologies:

PKN Gemini carbon capture technologies have been designed to reduce tailpipe Greenhouse gas (“GHG”) emissions and generate a high purity CO2 product for sequestration, enhanced oil recovery or other uses. The Gemini system can be installed on natural gas fired engines, boilers, heaters and process equipment.

The Gemini technologies are adaptable and flexible and as a result well suited for a host of GHG applications in greenfield, retrofit and portable/relocatable settings. The Gemini systems are compact, modular, low environmental impact designs and are suitable for a wide range of GHG emission sources. The systems are easy-to-operate, with proven technologies and are ideal for remote or partially attended locations. The CO2 recovery levels and purity of the Gemini technologies can be optimized to meet particular customer requirements, leading to reduced capital and operating costs over other carbon capture technologies.

Leadership:

PKN is led by Gary K. Nikiforuk (President and Chief Executive Officer) and Edward Barclay (Vice President, Business Development). Mr. Nikiforuk is an engineer with has over 35 years of experience in the energy and oil and gas industry in Western Canada and the United States, and has founded several successful private companies. Mr. Barclay’s background includes senior roles in business development with several major energy companies and intermediate and junior oil and gas producers operating both in Canada and internationally.

PKN Information:

For further information, please contact:

- Gary Nikiforuk (President & Chief Executive Officer): gknikiforuk@gmail.com or 403.923.4840
- Ed Barclay (VP, Business Development): edward.barclay@persona.ca or 403.874.2580



Power Kinetic Networks – Gemini Carbon Capture Systems

Technology to Reduce Natural Gas GHG Emissions Through CO2 Recovery

Gary K. Nikiforuk
President & Chief Executive Officer

Overview:

Gary K. Nikiforuk is one of the co-founders of Power Kinetic Networks. Mr. Nikiforuk developed the proprietary Gemini carbon capture technologies that are used by the Company. He provides executive and management oversight of the Company, including the commercial, technical and financial areas.

Mr. Nikiforuk has over 35 years of experience in the energy and oil and gas industry in Western Canada and the United States. He has founded and held executive and management positions in a number of successful private oil and gas companies. He has led engineering groups in several companies and has been responsible for ESG programs. His career has included management and execution of large projects from initial conception, feasibility analysis, design, procurement, construction, start-up and operation. He has successfully managed and overseen complex multi-faceted projects with capital expenditures exceeding \$100 Million.

Project Specific Experience:

Mr. Nikiforuk's experience includes engineering, design and operation of oil and gas production and power generation facilities. Specific projects include: oil batteries; natural gas treating; sour gas processing; NGL and ethane recovery plants; high pressure gas compression and NGL injection plants; crude oil, natural gas, water, products (NGL, ethane, ethylene and propane) pipelines; steam generation; NGL truck and rail loading facilities; pump stations and storage facilities (including caverns); stand-alone and behind-the-meter power generation; and telecommunication systems.

Education and Training:

Mr. Nikiforuk has a Bachelor of Science degree from the University of Alberta (1980). His training since graduation includes a range of industry courses relating to the energy, oil and gas and power sectors.

Work Chronology:

- Power Kinetic Networks (2019 to present): co-founder, President & CEO
- Private energy companies (1990 to 2019): co-founder, President & CEO of WestMan Exploration Ltd., Aquilo Energy Inc., PENMAX Exploration Ltd. and several other private energy companies
- Cody Energy Canada (1994): Executive Vice President
- Senior Engineering Consultant (1990 to 1992): clients included Enerplus Resources Corporation, PetroCanada, Canadian International Development Agency, and private oil and gas companies
- Amoco Canada Petroleum Company Ltd. (1980-1990): Supply and Marketing Advisor and Engineering Supervisor



Power Kinetic Networks – Gemini Carbon Capture Systems

Technology to Reduce Natural Gas GHG Emissions Through CO2 Recovery

Edward Barclay Vice President, Business Development

Overview:

Edward Barclay is one of the co-founders of Power Kinetic Networks (“PKN”). Mr. Barclay is responsible for overseeing the marketing and commercial efforts of the Company. These business development activities include: establishing customer contacts; negotiating commercial arrangements; and assessing new business opportunities and product lines. Additionally, he will lead developing commercial frameworks for PKN Gemini proprietary technologies including equipment sales and leasing, technology licensing and regulatory compliance oversight.

Mr. Barclay has a varied background in the energy and oil and gas industry in Canada and internationally. He has held senior roles overseeing large asset management programs including assets purchases and dispositions, corporate mergers and acquisitions, and unique financing deals and arrangements. During his 35-year career, Mr. Barclay has undertaken over \$1 Billion in asset related transactions.

He has led large commercial teams that have attracted third party capital exceeding \$250 million annually. Mr. Barclay has negotiated large work programs (including with international firms) that have delivered superior returns to his previous employers.

Project Specific Experience:

Mr. Barclay’s experience includes project conceptualization, optimizing capital sources, formal strategy presentations and authorizations, and high-level negotiation and dispute resolution supporting corporate strategies and targets. His responsibilities included developing marketing strategies, negotiating complex commercial deals and agreements, leading asset management teams, preparing marketing plans and materials, and corporate budgeting and reporting.

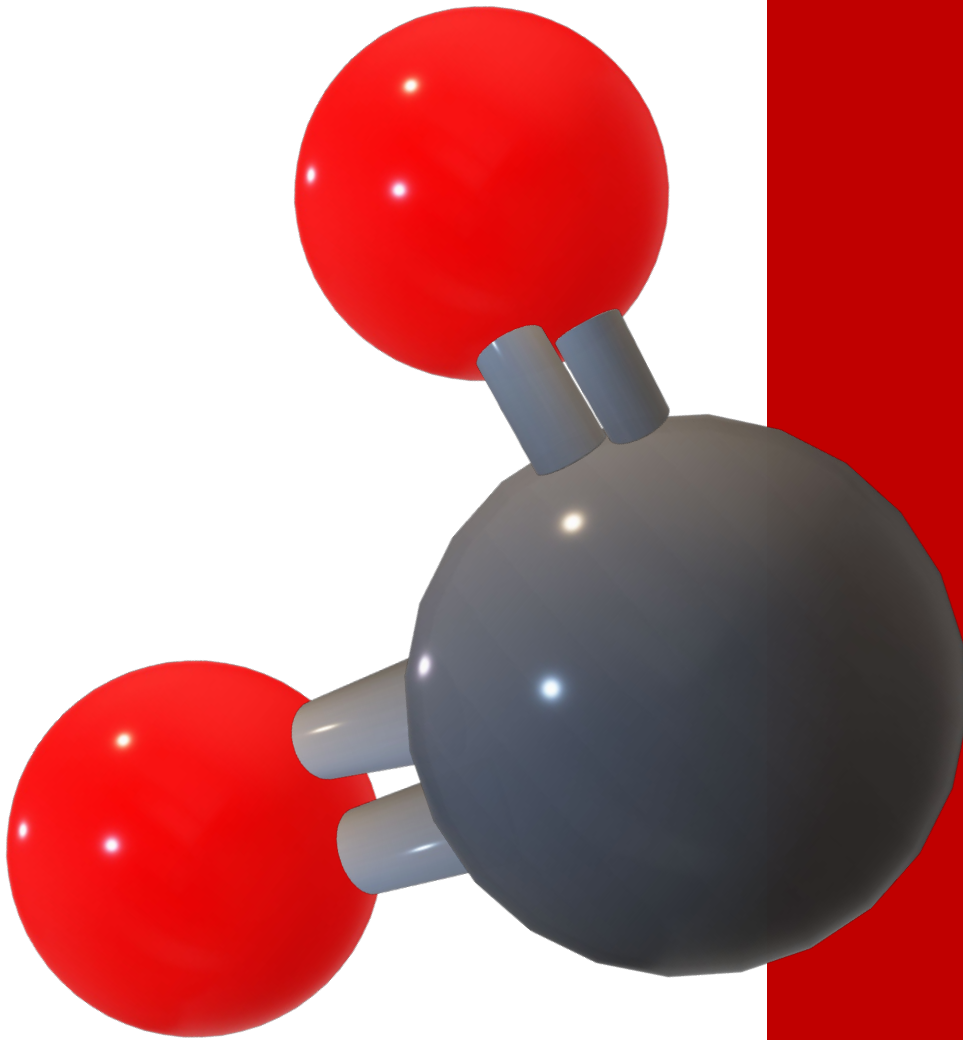
Education and Training:

Mr. Barclay graduated from land management program from Mount Royal College in Calgary, Alberta (1981). He has supplemented his education with industry courses relating to the energy, oil and gas and power sectors.

Work Chronology:

- Power Kinetic Networks (2019 to present): co-founder, Vice President, Business Development
- Business Development Consultant (2014 to present): clients included a number of private oil and gas companies including WestMan Exploration Ltd.
- EnCana and Alberta Energy Company (1990 to 2014): Team Lead, Land and M&A groups
- Forest Oil Corporation (1981 to 1990): Land Manager Canada/Alaska Division

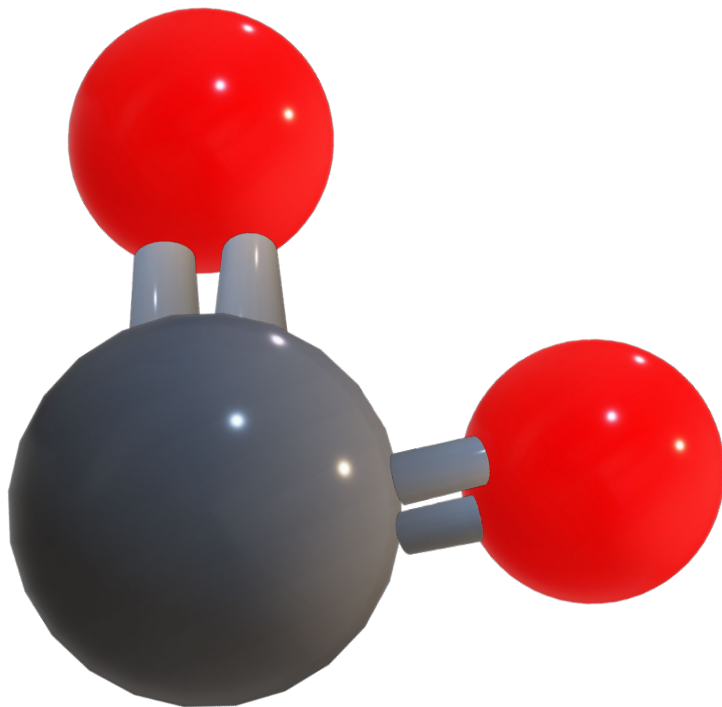
CO₂ Recovery



March 1st, 2022

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1.0 Corporate Overview

Obsidian Engineering was founded in 2016 on the premise that small to medium projects can be done more efficiently by a disciplined and flexible team. Our lean corporate structure promotes high-quality, low-cost solutions for projects ranging from \$5K to \$200MM.



WHO WE ARE

Full-service EPCM comprised of passionate and experienced individuals with an array of experience in the oil and gas industry. Obsidian Engineering brings together a multi-disciplinary team with key personnel having extensive project and technical experience.

VISION

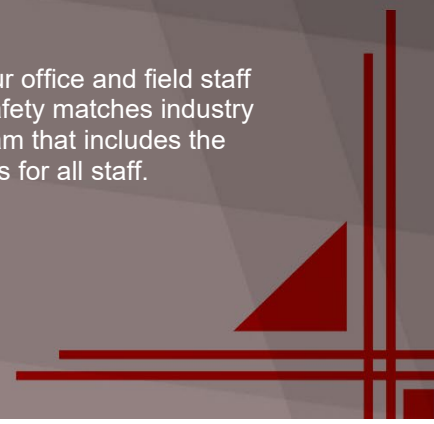
To provide our clients with a cost-effective option for today's market while maintaining flexibility in design and high quality of service.

EXPERIENCE

The Obsidian project team has extensive experience in technical engineering, construction, and operations. Obsidian employees have experience working for a diverse set of clients and projects from pipelines and facility modifications to greenfield compressor stations and gas plants.

SAFETY

Obsidian Engineering takes the safety of our office and field staff seriously and we feel our commitment to safety matches industry leaders. We have a complete Safety program that includes the monitoring and tracking of safety credentials for all staff.



2.0 Why Obsidian Engineering?

\$117/hr

Obsidian
Blended Rate

100%

Client Retention
Rate

QMP

Approved By
External Auditors

STRONG TEAM AND CULTURE

Because Obsidian Engineering was growing during the downturn, Obsidian could hire some of the best available talents. As a result, Obsidian offers high-calibre engineering services, but the strong culture that Obsidian has built has provided a great team to work with.

Our high staff retention levels maintain project consistency.

LOW COST

With one of the most aggressive rates sheets among competitors in the industry driven by our low overhead model, Obsidian Engineering is in a prime position to offer its clients the best value for every dollar spent. We aim to become a long-term partner with our clients, focusing on driving efficiencies to actively reduce the engineering cost and the total installed cost of the projects executed.

All rates are in Canadian dollars.

FIT FOR PURPOSE ENGINEERING

Our flexible and dynamic project team makes Obsidian Engineering the right size for small to medium projects with an express ability to react to client needs quickly. Our flat organization structure allows for fast decision-making and removes churn associated with multiple layers of management. Obsidian is fit-for-purpose with the ability to adapt our execution model to the size of the project we are tasked with.

COST CERTAINTY

Obsidian Engineering recognizes that cost certainty is essential. We are willing to work with clients on a fixed cost execution model or, for repeatable projects, a progressively lower cost driven by efficiencies. Due to our fit-for-purpose culture, we will work with our clients to find a flexible cost certainty model that works best for them.

QUALITY

Obsidian Engineering is committed to meeting and exceeding all client requirements by working towards a consistently high-quality product and continually improving our standard of service. This will be achieved through the implementation of Obsidian's Quality Management Process. Obsidian's QMP was built on the backbone of previous experiences and successes, which has been fine-tuned to ensure lessons learned are carried forward and efficiencies captured in Obsidian's path forward.

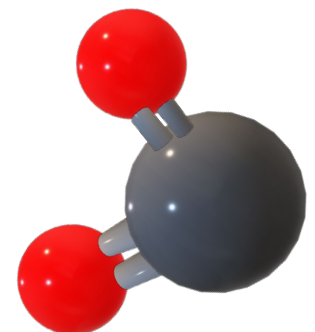
A copy of Obsidian QMP is available upon request.

3.0 Obsidian’s Team CO₂ Experience

Projects completed by Obsidian’s team are provided in the tables below

CLIENT	PROJECT NAME	SCOPE DESCRIPTION
Whitecap Resources Weyburn, SK	Cyclone Separator Install	<ul style="list-style-type: none"> • Install a Cyclone Separator into an existing CO₂ Enhanced Oil Recovery Facility to increase the compressor longevity through particulate removal • Cost Savings: 12%
Enhanced Energy	Pipeline Transportation System	<ul style="list-style-type: none"> • Carbon Dioxide Containing Impurities with the Objective to Develop an Optimal System Design with respect to Operation, Locating of Booster & Measurement Facilities, Pipeline Controls and Piping Size/Material Components
Enhanced Energy Clive, AB	Alberta Carbon Trunk Line	<ul style="list-style-type: none"> • Project to distribute CO₂ from Alberta Carbon Trunk Line throughout producing field. Lines consisted of bare carbon steel, HDPE pulled liners and CORE-line pipe materials. Lines were used for CO₂ distribution, new production, water disposal and a WAG (water alternating gas) EOR flood.
Enhanced Energy & Agrium	EOR Application	<ul style="list-style-type: none"> • Project Gate Review and Audit Process - Technical Assessment of a CO₂ Capture and Pipeline Transportation System Design for Carbon Dioxide Containing Impurities
Husky Oil	Lloydminster Upgrader	<ul style="list-style-type: none"> • To help reduce atmospheric emissions, this CO₂ rich off-gas will be recovered and upgraded to a high-pressure gas which HUSKY Energy can utilize for enhanced oil recovery purposes. • CO₂ Injection pilot project to increase production and reduced oil viscosity
Reef Energy	Confidential	<ul style="list-style-type: none"> • 4MW Power Generation with CO₂ Capture

CLIENT	PROJECT NAME	SCOPE DESCRIPTION
Santos Ltd, South Australia	Front End Engineering Study	<ul style="list-style-type: none"> Based on a solvent extraction method, analyze and offer the best available alternatives for CO₂ capture and compression Designed and evaluated included CO₂ capture, low-pressure conveyance, individual versus central cooling, main compression (conventional versus semi-isothermal & high ratio), liquefaction, dehydration, thermal integration systems and power production
Santos Ltd. South Australia	Moomba Gas Plant	<ul style="list-style-type: none"> Techno-economic study of existing and novel options for CO₂ capture and compression for use in an EOR application
Santos Ltd, South Australia	Pilot Plant Study	<ul style="list-style-type: none"> Liquid CO₂ Pilot Plant Study & Program Development for EOR Testing
Baytex Energy	Harmon Valley Sour Gas Plant	<ul style="list-style-type: none"> 18MMscfd Sour Gas Plant – 15% CO₂ removal Detailed design to completion phase of the project
SaskPower	Boundary Dam	<ul style="list-style-type: none"> CO₂ pipeline injection well facility
Various	Various Compressor Package	<ul style="list-style-type: none"> Recip. Compressor package CO₂ conversion, reassembly, and refurbish
Confidential	Gas Processing Facility	<ul style="list-style-type: none"> Support and direction for a CO₂ Capture and Liquefaction Feasibility Study using various technologies to allow for CO₂ fracing and enhanced oil recovery
Confidential	Confidential	<ul style="list-style-type: none"> 2MM tonnes/day of CO₂ capture in the oilsands



4.0 Obsidian's Team

Obsidian has over 100 full-time staff members. At this size, Obsidian can support the project with a full range of multi-disciplinary resources. Resumes for each team member have been included. Below is the suggested team for a CO₂ Recovery Project.

Dave Richards, P.Eng.

Pipeline Advisor

35 Years of Experience

Engineering lead on Boundary Dam CO₂ pipeline injection well facility for SaskPower.

Roderick Facey, Ph.D., P.Eng., CD

Process / Civil / Structural

30 Years of Experience

Lead technical engineer on multiple CO₂ capture and storage projects conducting FEED, project gate review and audit process, and pilot plant & program development studies for multiple companies.

Keith Davis, P.Eng.

Facilities Project Engineer

34 Years of Experience

Project manager on Clive central pipeline project to distribute CO₂ from Alberta Carbon Trunk Line throughout producing field.

Wayne Monnery, P.Eng.

Sr. Process Engineer

34 Years of Experience

Conducted projects on Propylene Production from Propane, Diluent Recovery, CO₂ Flood cycling. Also, a retrofit project of a reciprocating compressor package CO₂ conversion.

Plant efficiency project of 4MW power generation integrated with CO₂ capture

Mark Sun, P.Eng., PMP

Facilities Project Engineer

8 Years of Experience

Project engineer with a diverse range of projects in compressor stations, facilities, gas plants, well pads and MOCs varying in size and complexity.

Hitesh Oza, P.Eng.

Process Engineer

12 Years of Experience

Project engineer with a diverse range of projects in compressor stations, facilities, gas plants, well pads and MOCs varying in size and complexity. Project management experience as both an EPC and Owner's representative.

Rick Buckner

Manager Projects

39 Years of Experience

Provided support and direction for a CO₂ Capture and Liquefaction Feasibility Study using various technologies to allow for CO₂ fracking and enhanced oil recovery from an existing gas processing facility.

John Wiseman, P.Eng.

Electrical Engineer

30 Years of Experience

Conducted CO₂ injection pilot project with Husky Energy (part of Cenovus group of companies).

Mark Czechowsky, P.Eng.

Principal Engineer

16 Years of Experience

Principal Engineer participant and involvement in CO₂ capture projects, to establish measurement is the surveillance activities necessary for ensuring the safe and reliable operation of a CO₂ storage project

Taylor Bianchini, P.Eng.

Principal Engineer

10 Years of Experience

Principal Engineer ensures the safe and reliable functioning of a CO₂ storage project, participants, and engagement in CO₂ capture initiatives.

5.0 Recent Projects



Project: 05-35 Sour Oil Battery – Green Field

Eng. Cost: 4.6% (TIC \$35MM)

The objective of this project is to construct a new green-field sour oil battery to accommodate production from nearby well pads. This project includes inlet separation, oil treating, sales compression, dehydration, tank storage, skim/recycle system, water injection, LACT pumps, vapour recovery, recycle compression, fuel gas conditioning, HP & LP flare, power generation and a truckload/offload system. This project incorporates all subject areas of a green-field facility including process simulations, site grading, 3D drafted model, mechanical/structural construction, and E&I coordination.



Project: Karr South Pipeline Gathering System

Eng. Cost: 1.2% (TIC \$27MM)

Obsidian and SemCAMS worked together to construct a pipeline gathering system in northwest Alberta that consists of several pipelines ranging in sizes from NPS 6 to NPS 12 and lengths from 3.4 km to 10.9 km. The system is designed to feed the SemCAMS 05-35 Battery with emulsion from third-party producers and transport natural gas and crude oil to their respective sales points.



Project: 15-29 Sweet Oil Battery – Green Field

Eng. Cost: 5.5% (TIC \$20MM)

This green-field oil battery project includes heat exchangers, oil treating, tank treating, tank storage, skim/recycle system, oil/condensate blending, water injection, vapour recovery, casing gas separation, sales compression, dehydration, HP flare, power generation and a truck load/offload system. Obsidian completed this project on a low-cost basis by sourcing and procuring refurbished equipment

Obsidian has developed a reputation in the industry of being an extremely desirable place to work. With our strong work-life balance values and energetic office environment, we are often approached by industry members about employment opportunities.



OBSIDIAN

ENGINEERING

Projects can be done more efficiently by a disciplined and flexible team. Our lean corporate structure promotes **high-quality, low-cost solutions.**

Our Vision is to provide our clients with a cost-effective option for today's market while maintaining **flexibility in design and high quality of service.**

6.0 Additional Capabilities

Obsidian Engineering is also proficient in all other oil and gas-related facilities and pipeline projects.

LACT And Metering Stations

Various LACT building and metering skid installations.

- Westbrick – LACT installation for a 4” liquids line
- Tourmaline – LACT for Columbia and Edson Gas Plants
- Keyera – Fort Sask metering station

Rail Loading

Various rail and truck loading facilities projects

- CN Rail – Gasoline, diesel and bio-diesel multi-spur loading and offloading facilities
- Canexus - Rail loading meter station for bitumen and diluent product in the Bruderheim area

Liquids Rich Gas Facilities

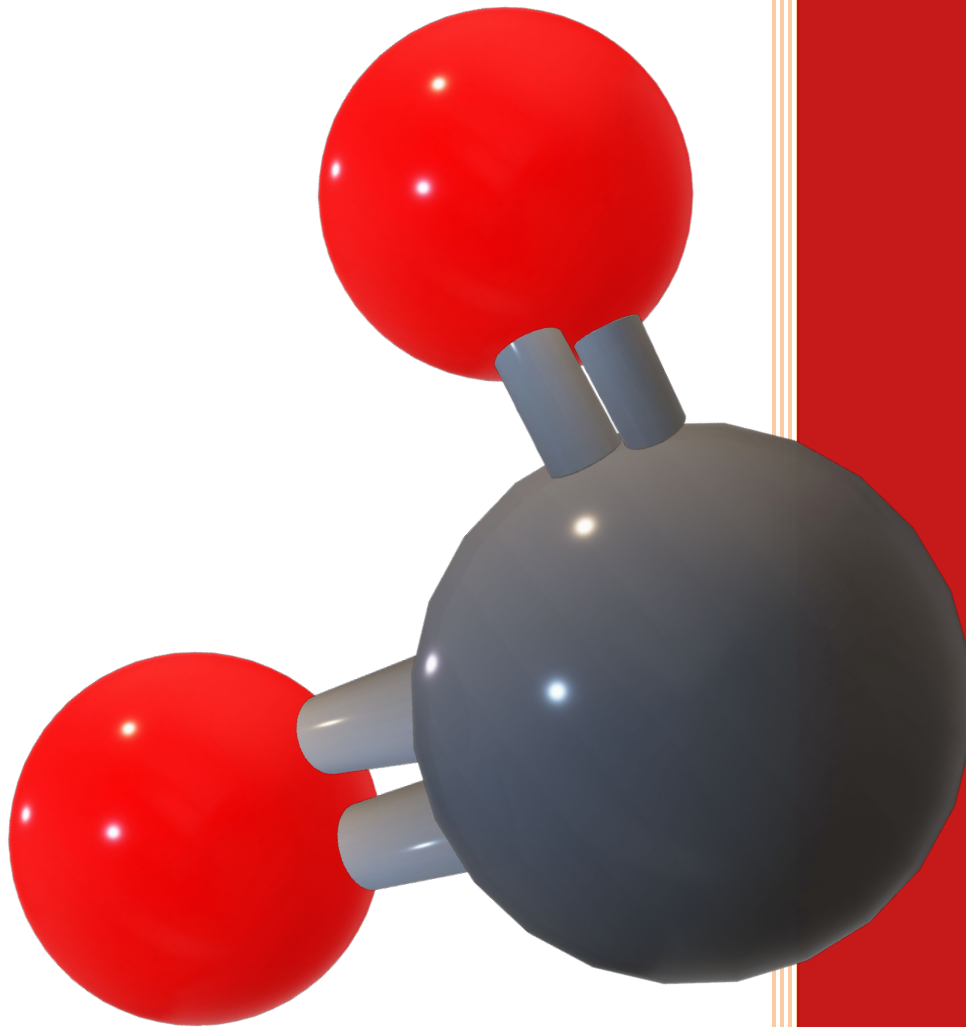
Numerous refrige and deep cut facilities projects

- Canbriam – 50MM/day Refrige facility
- Pennwest – 25MM/day Refrige addition
- Twin Butte – 5MM/day Refrige addition

Thermal Projects

Large and small steam facilities projects including

- Cenovus – Grass roots development of a SAGD facility with various options for flow path and operability
- Cenovus – Grass roots development of a CCS Pilot



Contact Us

First Canadian Centre
350 7 Ave SW
Calgary, AB T2P 3N9
P: 587-323-2218
ObsidianEng.ca

MTR was recently awarded a DOE contract on the design and construction of a 140 tonnes CO₂/day membrane based carbon capture project at the Dry Fork Station Coal Power Facility in Gillette, Wyoming.

Patents/Rights to Technical Data

PKN will be securing patents and rights for the intellectual property associated with the Gemini carbon capture technologies. This will cover a range of areas including process and specific equipment. This activity could extend to licensing arrangements with key suppliers.

Appendix G
MHA Nation Support

From: Kenny Lyson <klyson@mhanation.com>
Sent: Tuesday, February 22, 2022 10:06:45 AM
To: Josh Ruffo <JRuffo@enerplus.com>
Subject: [EXT] Re: PKN Information

External

Good Morning Josh,

I have reviewed Enerplus' CO2 emissions lowering plan. MHA Energy would like to commend Enerplus on their commitment to lowering emissions and flaring. MHA Energy supports and looks forward to seeing the results of this plan. Again thanks for your continued efforts.

Kenny Lyson

Director

MHA Energy



MANDAN, HIDATSA & ARIKARA NATION

Three Affiliated Tribes * Fort Berthold Indian Reservation
404 Frontage Road New Town, ND 58763
Tribal Business Council

Office of the Chairman
Mark N. Fox

March 9, 2022

Enerplus Resources (USA) Corporation

950 17th Street, Suite 2200

Denver, CO 80202

Re: MHA Nation Letter of Support for Enerplus CSEA Grant Funding

To Whom it May Concern:

On March 2, 2022, Enerplus Resources (USA) Corporation (“Enerplus”) presented a project proposal for Clean Energy Sustainability Authority grant funding titled “Internal Combustion Engine Carbon Capture and Sequestration” to the Tribal Energy Council. On March 9, 2022, Enerplus presented the same project to the Tribal Business Council. The MHA Nation has reviewed the project and is providing this Letter of Support for the Enerplus grant application. The MHA Nation appreciates Enerplus’ efforts to provide sustainable energy production solutions on the Fort Berthold Indian Reservation. The MHA Nation requests the Clean Energy Sustainability Authority approve the Enerplus “Internal Combustion Engine Carbon Capture and Sequestration” project for grant funding.

Sincerely,

Mark N. Fox