

July 31, 2024

Mr. Reice Haase Deputy Executive Director North Dakota Industrial Commission State Capitol – 14th Floor 600 East Boulevard Avenue, Department 405 Bismarck, ND 58505-0840

Dear Mr. Haase:

Subject: VBD NewCarbon RNG Project

NewCarbon Feedstocks, LLC ("NewCarbon") is pleased to submit the subject proposal to the North Dakota Industrial Commission Renewable Energy Program.

NewCarbon, a clean energy infrastructure company who develops, owns and operates infrastructure that delivers lifecycle carbon intensity reduction for North America's top industrial, agricultural and energy companies, is collaborating with VanBedaf Dairy LLP on the development of a renewable natural gas (RNG) project to harvest biogas from dairy manure via anerobic digestion, upgrade the gas, and deliver high-quality negative carbon intensity RNG to end users. Successful execution of this Project will add wealth for landowners and agriculture producers to build and maintain a robust rural economy in North Dakota. It will also decrease the carbon intensity of a family-owned farm in North Dakota which will generate information and knowledge that will increase the probability of bringing new renewable energy companies and industry investment to North Dakota's agricultural producers.

NewCarbon is committed to completing the project on schedule and within budget should the Commission approve the requested grant.

The \$100 application fee for this proposal is provided through ACH Transaction Number 503625864. If you have any questions, please contact me by telephone at (312) 718-9519 or by email at <u>omar.khayum@newcarbon.energy</u>.

Sincerely,

Omar Khayum, President NewCarbon Feedstocks, LLC



Renewable Energy Program

North Dakota Industrial Commission

Application

Project Title: VBD NewCarbon RNG Project

Applicant: NewCarbon Feedstocks, LLC

Principal Investigator: Matthew Moshier

Date of Application: July 31, 2024

Amount of Request: \$455,000

Total Amount of Proposed Project: \$930,000

Duration of Project: 12 months

Point of Contact (POC): Omar Khayum

POC Telephone: (312) 718-9519

POC Email: omar.khayum@newcarbon.energy

POC Address: 1057 Chadwick Ct., Aurora, IL 60502

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ABSTRACT

NewCarbon, a clean energy infrastructure company who develops, owns and operates infrastructure that delivers lifecycle carbon intensity reduction for North America's top industrial, agricultural and energy companies, is collaborating with VanBedaf Dairy LLP on the development of a renewable natural gas (RNG) project to harvest biogas from dairy manure via anerobic digestion, upgrade the gas, and deliver high-quality low-carbon RNG to end users. VanBedaf Dairy is a family-owned farm established in Carrington, North Dakota in 2008 with a focus on providing quality food for as many as possible while maintaining natural resources and minimizing their footprint. The dairy farm manages over 2,300 cows, milking, dry and heifer, and delivers milk to Cass Clay Creamery in Fargo for further processing into dairy products to service North Dakota and the surrounding region. The cow meals at VanBedaf Dairy are community-oriented and primarily consist of haylage, silage, and byproducts like canola meal, corn distillers, wheat middlings, and sugar beet pulp from local manufacturers. VanBedaf Dairy has also made significant investments in cow care, including high-tech ear tag sensors that make regular wireless contact with computers to ensure cow health and safety. **Objective:** The project objective is to conduct planning and feasibility activities over 12 months that will study sizing and integration of a renewable natural gas (RNG) project with VanBedaf Dairy's Carrington, North Dakota dairy farm. The scope of the planning and feasibility activities include market analysis, community outreach and engagement, pre-FEED engineering study, and feasibility studies to determine the availability and cost of utility feedstocks, financial model development and pipeline routing due diligence. Expected Results: Successful execution of this Project will support the Renewable Energy Program's (REP's) mission to promote the growth of North Dakota's renewable energy industries through research, development, marketing, and education. Upon completion of the 12-month Project duration, NewCarbon will decide whether to progress to a FEED study and subsequent development activities based upon meeting the following measurable criteria: (1) signed non-binding customer term sheets, (2) budgetary estimate from an EPC contractor based on the pre-FEED, (3) development of a community benefits plan, and (4) feasibility assessment of the technology achieving a TRL 9. Once operational, the proposed Project will add wealth for landowners and agriculture producers to build and maintain a robust rural economy in North Dakota. The project will also decrease the carbon intensity of a family-owned farm in North Dakota which will generate information and knowledge that will increase the probability of bringing new renewable energy companies and industry investment to North Dakota's agricultural producers. Methane produced from dairy farms is accountable for 4.5% of the total amount of methane released to the atmosphere (Diane Mayerfeld, n.d.). The project will bring the immediate advantage of reducing regional methane from the dairy industry, capturing biogas as a source of renewable fuel, and producing digestate byproducts as a nutrient-rich fertilizer. Additionally, due to the regional importance of the VanBedaf Dairy facility, the project will help support the REP's goals of helping to educate residents of the potential benefit of renewable products and begin stimulating growth in the renewable energy sector. RNG processing facilities will improve manure management and operations on the site that will benefit the surrounding Carrington community. When the project is fully operational the VanBedaf Dairy NewCarbon RNG Project will process approximately 26 million gallons of liquid manure to produce an

estimated 56,000 MMBTU per year of negative carbon intensity RNG that will satisfy emerging Midwest low carbon fuel standards (LCFS) and provide for a value-added derivative biofuel suitable for commercial and industrial natural gas customers (Francisco López, Lago Rodríguez, Faraji Abdolmaleki, Galera Martínez, & Bello Bugallo, 2024). The Project will create an estimated 40-65 temporary (12-18 months) construction, engineering, and fabrication jobs and 3-5 new permanent facility/operations jobs. The majority of Midwest Dairy RNG operating projects have focused on facilities with greater than 5,000 cows. NewCarbon plans to evaluate new turnkey standardized biogas system configurations for dairy farms with animal units between 1,000 to 3,000 cows, which will increase sustainability and economic viability for small to medium sized dairy producers and other Concentrated Animal Feeding Operations (CAFOs), which are more prevalent in North Dakota. Small CAFOs, where resources and space are limited, face unique challenges for manure storage and management. RNG production improves onfarm manure management, significantly reduces greenhouse gas (GHG) emissions in agriculture, provides a new revenue stream, and advances environmental stewardship. The project represents a novel integration of dairy manure handling, anaerobic digestion, biogas upgrading and gas delivery which can be replicated at other North Dakota dairy operations. This project paves a pathway for other dairy operators to begin to implement RNG projects at their own facilities, creating additional revenue streams and helping take a step towards a clean energy economy. **Duration:** 12 months, with an anticipated start date of November 1, 2024. Total Project Cost: \$930,000 with \$455,000 from the North Dakota Industrial Commission Renewable Energy Program and \$475,000 from NewCarbon Feedstocks, LLC. Participants: NewCarbon Feedstocks, LLC and VanBedaf Dairy LLP.

PROJECT DESCRIPTION

Objectives: The project objective is to conduct planning and feasibility activities over 12 months that will study the sizing and integration of a renewable natural gas (RNG) project with the existing dairy to reduce emissions of fugitive methane from manure management at the VanBedaf Dairy farm in

Carrington, North Dakota. The scope of the planning and feasibility activities include market analysis, community outreach and engagement, pre-FEED engineering study, feasibility studies to determine the availability and cost of utility feedstocks, financial model development and pipeline routing due diligence. Particular emphasis will be placed on community outreach and public engagement activities that will support improved understanding of stakeholder concerns, community attitudes, and public acceptance of RNG. The biomethane potential of livestock manure depends on factors such as type of livestock, manure management practices, and the composition of waste. NewCarbon will analyze the consistency of feedstock, moisture content, nutrient content, and other characteristics to improve the efficiency and performance of the conversion process. Manure at VanBedaf Dairy is currently stored in lagoons, where it naturally starts decomposing and releasing methane into the atmosphere, until it can be applied as a fertilizer. The Project will design an RNG processing facility to capture large quantities of manure in anaerobic digesters and use microbial communities to break down the manure into raw biogas. The digesters process and store manure for an average of 25 days, during which time high heat pasteurizes the slurry killing the majority of pathogens. The raw biogas is subsequently upgraded to natural gas pipeline specification which results in negative carbon intensity natural gas when compared to fossil fuel-derived natural gas. This negative carbon intensity RNG is then delivered to customers either through existing natural gas pipelines or via trucked compressed natural gas. A pump system will move the residual organic matter, digestate, from the anaerobic digestion process to a manure solids separator which divides the waste stream into solid and liquid components. The resulting liquid effluent can be pumped through standard irrigation systems for direct application to field crops. The dairy farms will be able to reclaim and recycle the water, thereby improving conservation efforts. When it is fully operational the Project will process approximately 26 million gallons of liquid manure to produce an estimated 56,000 MMBTU per year of negative carbon intensity RNG. The development of a standardized biogas system configuration for small to medium sized CAFOs will improve the

sustainability of North Dakota livestock operations and convert decomposing manure into a valuable product. Anaerobic digestion of dairy manure also reduces odors compared to uncovered manure storage and decreases the risk of nutrient runoff into waterways (Francisco López, Lago Rodríguez, Faraji Abdolmaleki, Galera Martínez, & Bello Bugallo, 2024). **Methodology:** The Project is organized into eight major tasks. NewCarbon will employ its turnkey project development process to ensure technical, development, and financial feasibility (see **Error! Reference source not found.**). This process provides multiple stage gates to ensure the Project follows a rigorous governance process to maximize project viability and risk reduction. During the 12-month duration of the Project, NewCarbon will complete all early-stage development activities and certain mid-stage development activities, such as the pre-FEED study, pursuant to the process in Figure 1 which are vital to producing realistic cost and schedule information and further validate feasibility of the proposed technology and project.

Figure 1: NewCarbon Turnkey Project Development Process

Key Activities	Activity Sub-Category		Early-Stage Development	Ŋ	Mid-Stage Development		Late-Stage Development		Construction	>	Operations
Customer	Customer Solutions	ŀ	Sales Qualification	ŀ	Sales Execution			Ī		ŀ	Product Delivery
Solutions & Financing	Financing	·	Engage Counterparty and Preliminary Screen	ŀ	Due Diligence		Transaction Execution	ŀ	Transaction Delivery		Transaction Delivery
Land Control	Land Control	·	Site Option	÷	Site Option	·	Site Control			1	
& Public Relations	Public Relations	ŀ	PR Plan	ŀ	Light PR Campaign	•	Full PR Campaign	I		Ľ	
Environmental & Permitting	Env./Permitting	•	Plan/Assessment	ŀ	Filings/Studies	•	Major Obtained	ŀ	All Permits Completed	l	
Utilities	Interconnections	ŀ	Feasibility	·	System Impact / Facilities	٠	Interconnection Agreement			i.	
Project Management	Owners Schedule	ŀ	Level 1/ PMS	ŀ	Level 2	·	Level 3				
	Technology	ŀ	Tech Selection	ŀ	Preliminary Cut Sheet	ŀ	Final Cut Sheet	T		Ľ	
Project Engineering	Resource	ŀ	Plan/Assessment	Ŀ	Studies	٠	Final Assessment	L		Ľ	
engineering	Engineering	ŀ	Feasibility	•	Pre-FEED		FEED	ŀ	Final Eng. & Design		
Supply Chain Procurement	Major Equipment	·	Prelim Pricing	ŀ	Negotiated T&Cs	·	Contracts Signed	ŀ	Operational Readiness / Program Integration / I		m Integration / Maintenance
EPC	EPC/BOP	•	Prelim Pricing	÷	RFP Issued / Term Sheets	٠	EPC/BOP Signed	1	Program Deployment		
Engagement	Qual. of Estimate	ŀ	Feasibility	•	Budgetary	 Definitive 		 Execution 			
			Customer	Ac	quisition Customer	Fin	alization Final Inves	stn	nent Decision Com	me	rcial Operations

Turnkey Process | Seamless Project Development, Construction and Operations

Task 1.0: Market Analysis. The objective of this task is to obtain signed, non-binding customer term sheets from customers for long-term offtake of the RNG product. In terms of market demand for RNG, North Dakota has in-state Biofuels and Sustainable Aviation Fuels facilities which require RNG as a low

carbon feedstock to achieve their carbon intensity targets. Many out of state entities are also seeking RNG to meet voluntary or compliance-driven sustainability targets. The scope for Task 1 includes sales and marketing efforts, financial analysis, and execution of commercial transactions. Activities involve developing sales strategies for Renewable Natural Gas (RNG), identifying and reaching out to prospective customers, engaging with customers to discuss terms and conditions for long-term offtake of RNG and preparing and drafting commercial and legal documents to memorialize offtake agreements.

Task 2.0: Property Due Diligence. The goal of this task is to determine the legal and environmental suitability of the RNG plant site. The scope includes conducting a property title search and assessing the site for any legal or environmental issues that could affect the project. The dairy farm uses sand bedding and separates manure solids mechanically. This process would need to be moved to the digester location and take place after manure has gone through the digester. Sand bedding has caused manure handling challenges for anaerobic digestion as sand can settle in tanks and cause equipment wear. Small amounts of bypass sand can be problematic for effective operations of anaerobic digestion systems. NewCarbon will evaluate mechanical sand-manure separation equipment as anaerobic digestion pre-treatment to recover up to 98% of the sand for reuse, which will improve the dairy operation and increase the total organic solids going into the digester. RNG production can also be affected by technical challenges such as impurities and moisture in the feedstock. NewCarbon will evaluate new technologies to improve the efficiency and effectiveness of RNG production and implement quality control processes in the design basis. The project team will optimize the equipment and general plant arrangement, installation, and interconnecting piping of the RNG processing facilities with the existing Carrington, North Dakota dairy farm.

Task 3.0: Community Outreach and Engagement. This task aims to deliver maximum value to the North Dakota community through effective engagement and communication. The community benefits plan will address community and labor engagement and discuss the creation of high-quality jobs and

development of a skilled workforce. Activities include designing and implementing a community outreach strategy and engaging with local stakeholders to communicate Project benefits and gather stakeholder input.

Task 4.0: Engineering Services. The goal is to conduct preliminary front-end engineering and relevant studies to ensure the facility's viability for RNG production. The scope includes pre-FEED Engineering Study, Lifecycle Assessment (LCA), Biogas Quality Study, Plant Permit Matrix, and Pipeline Permit Matrix. Project team will identify and quantify major material and energy inputs and outputs for a biogas production system. The design analysis will include a closed-loop sand-manure separation system that will rely on minimal water addition to achieve separation and reduce the volume of water fed into the digester. The sand-manure separation system will follow industry best practices in engineering and design to ensure a consistent system operation, and handle manure in an environmentally friendly way. Task 5.0: Developer Services. The goal is to perform feasibility studies to determine the availability and cost of utility feedstocks/inputs into the RNG project. The scope includes Electrical, Natural Gas, Wastewater, and Feedwater Interconnection Feasibility.

Task 6.0: Project Pro-Forma/Budget. This task aims to develop a pro-forma model to support offtake pricing and construction financing needs. The pro-forma will leverage the data from the pre-FEED study, estimated carbon intensity based on existing dairy operations and proposed equipment installations, interconnection, land, and financing costs.

Task 7.0: Site Acquisition Planning. The objective is to plan site acquisition for pipeline routing to the interconnection location. NewCarbon will design an upgrading system to meet required pipeline specifications and develop a planned pipeline route that will meet safety and regulatory requirements.
Task 8.0: Sourcing Project Funding. This task focuses on identifying other funding sources and federal, local, and state tax incentives for renewable natural gas.

Anticipated Results: Successful execution of this Project will support the Renewable Energy Program's (REP's) mission to promote the growth of North Dakota's renewable energy industries through research, development, marketing, and education. Upon completion of the 12-month Project duration, NewCarbon will decide whether to progress to a FEED study and subsequent development activities based upon meeting the following measurable criteria: (1) signed non-binding customer term sheets, (2) budgetary estimate from an EPC contractor based on the pre-FEED, (3) development of a community benefits plan, and (4) feasibility assessment of the technology achieving a TRL 9. Once operational, the proposed Project will add wealth for landowners and agriculture producers to build and maintain a robust rural economy in North Dakota. The project will also decrease the carbon intensity of a familyowned farm in North Dakota which will generate information and knowledge that will increase the probability of bringing new renewable energy companies and industry investment to North Dakota's agricultural producers. The proposed project will also reduce environmental impacts of dairy feedlot operations while producing a value-added derivative biofuel suitable for commercial and industrial natural gas customers. Processing agricultural waste, such as animal manure, into RNG has significant potential in North Dakota as one of the largest agricultural producers in the United States. When the project is fully operational the VanBedaf Dairy NewCarbon RNG Project will produce approximately 56,000 MMBTU per year of negative carbon intensity RNG that will satisfy emerging Midwest low carbon fuel standards (LCFS) and provide for a value-added derivative biofuel suitable for commercial and industrial natural gas customers. The Project will create an estimated 40-65 temporary (12-18 months) construction, engineering, and fabrication jobs and 3-5 new permanent facility/operations jobs. Facilities: NewCarbon will be working directly with a large-scale EPC contractor as well as other subcontractors with significant facilities and capabilities in the execution animal waste RNG projects. NewCarbon will be working with contractors who are able to apply best practices for dairy farms using sand bedding with anaerobic digestion systems, which are particularly susceptible to sand settling and

equipment wear, to avoid the design pitfalls from earlier implementations and improve overall system performance. The NewCarbon team has developed relationships across the energy, engineering, and construction sectors and will augment the NewCarbon capabilities as needed. During the course of this Project, NewCarbon will be working directly with VanBedaf Dairy to ensure clear and consistent communication between the two organizations.

Resources: No equipment is expected to be purchased during the initial 12-month planning and feasibility stage. The project participants control the Project and have effective control of the land. **Techniques to Be Used, Their Availability and Capability:** The proposed team has committed to the project and has ensured the availability of key personnel for the time frame of this project. Any and all relevant publicly available data will be used for the project.

Environmental and Economic Impacts while Project is Underway: There will be no environmental impact during the initial 12-month planning and feasibility stage. During operations, the RNG project will avoid methane emissions from decomposing dairy manure while producing negative carbon intensity fuel for industry in North Dakota and surrounding regions. Funding through NDIC will help offset initial development costs of RNG projects in the North Dakota dairy sector and help develop a potential roadmap for successful project execution of RNG projects at scale.

Ultimate Technological and Economic Impacts: The team believes that as more RNG projects are developed, the costs of the technologies employed will continue to fall and projects such as this will become more economically, socially and environmentally beneficial. The project represents a novel integration of dairy manure handling, anaerobic digestion, biogas upgrading and gas delivery which can be replicated at other North Dakota agricultural feedstock and dairy operations. The Project will create an estimated 40-65 temporary (12-18 months) construction, engineering, and fabrication jobs and 3-5 new permanent facility/operations jobs in North Dakota. The use of manure for RNG production can

provide a valuable contribution for increasing the prosperity of dairy farmers and their communities in the North Dakota agricultural landscape.

Why the Project is Needed: This Project will be key to increasing momentum for RNG deployment in the North Dakota agricultural sector. Agriculture is one of North Dakota's leading industries, with its dairies producing milk for 593 million 8-ounce servings United States (ND Department of Agriculture). The proposed Project is a critical enabler to growing the low carbon dairy industry and creating energy transition jobs in North Dakota. The design, development and implementation of an anaerobic digestion facility adjacent to VanBedaf Dairy using its manure as a feedstock will capture and beneficially reuse biogenic methane for use in the region. Small and medium sized dairies lack the financial resources to invest in sophisticated manure management systems like anaerobic digestion and biogas upgrading, but the growing demand and value of negative carbon intensity RNG can financially underpin a project with proper engineering and design factoring in best practices for operations. The feasibility study will support the innovation and implementation of biogas production at small to medium sized CAFOs, explore ways to reduce waste, improve sustainable practices in livestock operations in North Dakota, and provide an additional revenue stream for dairy farm operations.

STANDARDS OF SUCCESS

Upon completion of the 12-month project duration, NewCarbon will decide whether to progress to a FEED study and subsequent development activities based upon meeting the following measurable criteria: (1) Signed non-binding customer term sheets, (2) budgetary estimate from an EPC contractor based on the pre-FEED, (3) development of a benefits plan, and (4) feasibility assessment of the technology achieving a TRL 9. Successful execution of this Project will support the Renewable Energy Program's (REP's) mission to promote the growth of North Dakota's renewable energy industries through research, development, marketing, and education. The proposed Project will add wealth for landowners and agriculture producers to build and maintain a robust rural economy in North Dakota.

The proposed Project will also decrease the carbon intensity of a family-owned dairy farm in North Dakota which will generate information and knowledge on innovative ways to handle manure management that will increase the probability of bringing new renewable energy companies and industry investment to North Dakota's dairy industry and other livestock operations.

BACKGROUND/QUALIFICIATIONS

NewCarbon will lead and oversee all proposed project activities. The Principal Investigator (PI) is Matt Moshier (NewCarbon Head of Engineering) who has more than ten years of energy project execution and development experience across the conventional and clean energy sectors, and has completed over \$3 billion in capital development, execution, and maintenance work at BP, Williams and TC Energy. The Business Point of Contact (POC) is Omar Khayum (NewCarbon Founder and CEO) who has over 15 years of experience in the energy domain. Prior to founding NewCarbon, Omar served as the CEO of Annova LNG and held executive and leadership roles at TC Energy, Constellation Energy and Exelon Corporation. NewCarbon develops, owns and operates infrastructure that delivers lifecycle carbon intensity reduction. We do this through fit-for-purpose solutions that integrate seamlessly across our customers' value chains. NewCarbon's turnkey infrastructure process makes it easier for customers to reduce lifecycle carbon intensity so they can remain focused on their core businesses. VanBedaf Dairy is a family-owned farm established in Carrington, North Dakota in 2008.

MANAGEMENT

NewCarbon will oversee all tasks, schedule regular internal and external meetings with project participants and contractors and ensure that the project is conducted using industry best practices in accordance with the project plan (budget, schedule, deliverables, and milestones) and is meeting quality objectives. NewCarbon will keep all partners informed of project progress, coordinate activities as necessary for the execution of a successful project and will be responsible for timely submission of all project deliverables and transfer of data and products to the project team. Key Roles: NewCarbon Feedstocks, LLC: Provides project director resources, manages the overall project execution and oversees the contractors and will lead origination effort to sign non-binding term sheet(s) with customers for long-term sale of the RNG. VanBedaf Dairy LLP: Provides site specific data and volume and composition of dairy manure that will feed the anaerobic digestion process.
Contractors: Community Benefits Consultant, Land Control, Environmental/Permitting Consultant, Life Cycle Assessment, Engineering/EPC, Electrical/Water/Pipeline Interconnect Consultant, Financial

Modeling Consultant, and OEMs.

Project Duration (12-Month) Go/No-Go Evaluation Point: NewCarbon will decide whether to progress to FEED/Mid-Stage development phase based on the End of Project Goal (SMART).

End of Project Goal: Upon completion of the 12-month Project duration, NewCarbon will decide whether to progress to a FEED study and subsequent development activities based upon meeting the following measurable criteria: (1) Signed non-binding customer term sheets, (2) budgetary estimate from an EPC contractor based on the pre-FEED, (3) development of a benefits plan, and (4) feasibility assessment of the technology achieving a TRL 9.

TIMETABLE

This Project is proposed to be performed over a 12-month period, with an anticipated start date of November 1, 2024. Quarterly progress reports will be submitted within 30 days after the end of each calendar quarter. **Error! Reference source not found.** depicts the proposed schedule.

Figure 2: VBD	NewCarbon	RNG	Project	Schedule
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NewCarbon Feedstocks	Year	20	24						2025						
ASC RNG Project	Quarters	Q	4		Q1			Q2	Q3				Q4		
	# of Months	11	12	1	2	3	4	5	6	7	8	9	10	11	
Mid- Stage Development		November	December	January	February	March	April	May	June	July	August	September	October	November	
NDIC Grant Award		1													
Sales Qualification														1	
Engage Fiancing Counterparty and preliminar	ry screen													1	
Site Option														1	
Community Benefits Plan														1	
Pre-FEED Engineering													1		
Life Cycle Analysis													1		
Biogas Quality Study			1												
Permit Matrix													1		
Electrical Interconnection													1		
Natural Gas Pipeline Interconnection													1		
Water/Waste Water Interconnection													1		
Proforma/ Budget														1	
Pipeline Routing Due Diligence													1		

BUDGET

The total estimated cost for the proposed work is \$930,000, as presented in Table 1. NewCarbon requests \$455,000 from the North Dakota Industrial Commission Renewable Energy Program to be matched with \$475,000 from NewCarbon Feedstocks, LLC. Budget notes can be found in Appendix D.

Table 1: VBD NewCarbon RNG Project Budget

Project Associated Expense	NDIC's Share	Applicant's Share (In-Kind)	Total Project
Labor (Salaries + Fringe Benefits)		\$475,000	\$475,000
Travel	\$22,000		\$22,000
Supplies	\$5,000		\$5,000
Task 1.0: Market Analysis	\$25,000		\$25,000
Task 2.0: Property Due Diligence	\$5,000		\$5,000
Task 3.0: Community Outreach and Engagement	\$40,000		\$40,000
Task 4.0: Engineering Services	\$265,000		\$265,000
Task 5.0: Developer Services	\$33,000		\$33,000
Task 6.0: Project Pro-Forma/Budget	\$15,000		\$15,000
Task 7.0: Site Acquisition Planning	\$40,000		\$40,000
Task 8.0: Sourcing Project Funding	\$5,000		\$5,000
Total	\$455,000	\$475,000	\$930,000

CONFIDENTIAL INFORMATION

No confidential information is included in this proposal.

PATENTS/RIGHTS TO TECHNICAL DATA

It is not anticipated that any patents will be generated during this Project. The rights to data generated

will be held NewCarbon Feedstocks, LLC and its affiliates.

STATE PROGRAMS AND INCENTIVES

NewCarbon Feedstocks, LLC has not participated in any programs or incentives from the State in the last

5 years.

APPENDIX A

LETTERS OF SUPPORT

VanBedaf Dairy

6959 2nd Street NE Carrington, ND 58421

[DATE] 7/25/24

To Whom It May Concern,

I am writing this letter to express VanBedaf Dairy's support of NewCarbon's proposed renewable natural gas (RNG) project at our dairy and the corresponding issues it will address.

VanBedaf Dairy produces approximately 26 million gallons of animal waste per year. NewCarbon proposes a manure management project with anaerobic digestion on site. This manure management project will collect and treat the manure producing approximately 56,000 MMBtu per annum of pipeline quality renewable natural gas. We support NewCarbon's application to secure grant funding from the North Dakota Industrial Commission Renewable Energy Development Program and other funding sources which will enable them to advance through Phase 1 planning and feasibility tasks of this clean energy project.

NewCarbon's proposed project would serve the State of North Dakota and its residents by promoting environmental sustainability. By capturing and upgrading biogas, the project reduces greenhouse gas emissions, avoids watershed contamination, and reliance on fossil fuels, aligning with environmental regulations and improving air quality. This holistic approach reflects a commitment to sustainable development and responsible resource utilization.

NewCarbon is a clean energy infrastructure company who develops, owns and operates infrastructure that delivers lifecycle carbon intensity reduction for North America's top industrial, agricultural and energy companies. Their turnkey infrastructure process makes it easier for partners like VanBedaf Dairy to reduce lifecycle carbon intensity so we can remain focused on what we do best. While delivering on a lower-carbon future, we can attest that NewCarbon takes a collaborative approach to maximizing economic benefits to the local communities in which they operate.

Please do not hesitate to reach out to me if you require any further information. I look forward to witnessing the progress and positive economic impact that NewCarbon will deliver.

Thank you for considering my support.

Sincerely,

Kohm Rudy

Piet van Bedaf Owner

APPENDIX B

RESUMES OF KEY PERSONNEL

OMAR KHALID KHAYUM

1057 Chadwick Ct., Aurora, IL 60502 | (312) 718-9519 | omar.khayum@gmail.com | linkedin.com/in/omarkhayum

EDUCATION

The University of Chicago Booth School of Business

MBA (Honors); Concentrations in Economics, Finance & Entrepreneurship

Beta Gamma Sigma

Purdue University

Bachelor of Science, Computer Science (Honors); Minors in Mathematics & Management

Phi Beta Kappa, Kappa Sigma, Alpha Kappa Psi

EXPERIENCE

NewCarbon, LLC

Founder and Chief Executive Officer

Founded a clean energy infrastructure company that delivers lifecycle carbon intensity reduction through fit-for-purpose infrastructure solutions that integrate seamlessly across customers' value chains

Cognitive Concierge, LLC

Founder and Board Member

Founded a health and wellness company that provides virtual services to families navigating cognitive conditions

MemoryCare Corporation

Founder and Board Member

Founded a healthcare company that provides Speech, Occupational and Physical Therapy to individuals with cognitive conditions

TC Energy

Vice President – North American Low Carbon Origination and Development

- Led customer origination for North American power, environmental, natural gas and hydrogen development and trading platform
- Led asset development for North American low carbon platform, including wind, solar, pumped hydro, renewable natural gas, green hydrogen production, blue hydrogen production and carbon capture
- Led asset financing for North American low carbon platform, including strategic equity, project debt and tax equity

Annova LNG

Chief Executive Officer, Annova LNG

- Led a 6.5 MTPA greenfield liquefied natural gas (LNG) export startup company in Texas
- Led development capital fundraising, project finance debt and equity fundraising and origination of long-term offtake contracts
- Led development activities resulting in FERC and DOE approvals to construct and operate the LNG export facility
- Chief Operating Officer, Annova LNG September 2017 – September 2018

Constellation Energy

Managing Director – Origination, Constellation Energy

Led origination for Constellation's natural gas and LNG trading business

Managing Director – Strategic Projects, Constellation Energy

Led establishment of joint venture providing development services to new nuclear power stations in the UK and Japan

Exelon Corporation

Managing Director - Generation Development, Exelon Generation

Led greenfield development for utility scale power generation projects, resulting in financing and construction of over \$3 billion of new assets, including over 2.5 GW of natural gas, wind, solar and battery storage capacity across the continental United States Manager – Generation Development, Exelon Generation August 2014 – May 2015 Manager – Wind Business Development, Exelon Generation June 2013 – July 2014 Manager – Corporate Strategy, Exelon Business Services Company November 2012 – May 2013 Principal Analyst - Corporate Strategy, Exelon Business Services Company February 2011 – October 2012 Senior Analyst – Corporate Financial Planning & Analysis, Exelon Business Services Company

Diamond Management & Technology Consultants

Associate and Analyst – Strategy & Marketing Competency

Chicago, IL September 2007 – June 2009

West Lafayette, IN August 2000 - May 2004

November 2023 – Present

September 2019 – Present

March 2021 – October 2023

October 2018 – March 2021

Chicago, IL

Chicago, IL

Chicago, IL March 2010 – Present

Houston, TX

Houston, TX

Baltimore, MD

September 2017 – March 2019

January 2017 – August 2017

Chicago, IL

June 2015 – December 2016

August 2009 – January 2011

Chicago, IL June 2004 – June 2007

Matthew William Moshier, MBA, P.E., P.M.P.

Email: mwm5221@gmail.com Phone: 724-825-8406

WORK EXPERIENCE

New Carbon

Head of Engineering

- Accountable for financial analysis, project management, and engineering for a variety of low carbon products to lower customers carbon intensity in the Midwest
- Submitted five DOE concept papers with customer engagement to EERE to obtain development funding for hard to abate emitters
- Developed financial models to support financing of RNG portfolio on a project and portfolio basis
- Engagement with customers across the carbon lifecycle- from feedstock development to product sale and financing
- Development of term sheets for potential offtake, feedstock supply, and investment

Strata Clean Energy

Senior Director of Engineering

- Led execution of pre-FEED study to determine viability of ammonia production with solid oxide electrolysis
- Served as the technical advisor for stage gated process to drive efficient capital deployment and accountability
- Conducted due diligence across portfolio of electrolysis and ammonia production vendors to determine vendor selection
- Developed siting and deployment strategy to identify potential deep-water ammonia shipping and staged capital deployment
- Led customer engagement in order to commercialize a portfolio of ammonia production facilities
- Created a technoeconomic analysis tool for the leadership team to determine the potential customer cost impact for variety of transportation methods

TCEnergy

Senior Project Manager-Project Development

- Directly managed three employees to meet overall corporate net zero ambitions and drive project development and execution
- Recruited, interviewed, onboarded, and managed multiple employees into the engineering and development group
- Project director for a confidential fully integrated, large scale biofuels facility, with full feedstock supply and offtake
- Managed over 1000 tonne per day (tpd) across 15 FEL studies in various levels of development to develop scope, schedule, and cost to meet customer needs for hydrogen and Carbon Capture Utilization and Storage (CCUS) projects
- Created hydrogen sales and purchase agreement (HSPA) and associated financial and pricing model
- Developed TCEnergy Chemours Joint venture to develop 20 tpd of electrolysis and DOE cost share agreement (Press Release)
- Managed development team to submit four DOE hub applications to receive over \$2 Bn in DOE funding
- Executed option to purchase two, 30 tpd liquefaction trains from Plug to support safe harbor investment strategy (Press Release)
- Developed financial and pricing model for green and blue hydrogen as well as capital and operational costs to support
- Executed Life Cycle Analysis across the hubs in order to quantify Carbon Intensity and environmental impact
- Recipient of a DOE loan for \$1.3 Bn from the Loans Program Office for Phoenix Hydrogen Hub (Press Release)
- Lead developer for Phoenix Hydrogen Hub (Nikola JV) and key member of due diligence and execution
- Managed multiple Joint Venture (JV) partners and customer engagement with varying levels of ownership
- Developed multiple hydrogen and CO2 pipeline routings and strategies to support hub development and potential offtake
- Negotiated CO2 CCUS sequestration agreement with third party to ensure project bankability
- Lead developer for offtake negotiations for potential biofuels, logistics, and other potential off takers
- Developed hydrogen offtake agreement and pricing structure for customer negotiations in conjunction with JV partners
- Directly involved with the commercial negotiations and financial model development for all projects to ensure engineering perspective is incorporated with main accountabilities for capital and operational expenditures
- Created updated governance structure to ensure viability of project financing and execution for hydrogen and CCUS projects
- Completed due diligence across the hydrogen technology portfolio, including operating and manufacturing site visits
- Developed scope, schedule, and cost for ammonia export terminals to advance hydrogen producing opportunities
- Designed of the metrics spreadsheet to more effectively allow engineering team to provide high level development design criteria to understand feasibility of potential projects for rapid RFP response
- Utilized existing and new data sources to provide recommendations for potential Long Term Supply Agreements for SMR, ATR, Electrolysis, Liquefaction, and biofuels production vendors
- Developed templates to help expedite EPC inputs into financial model, reducing time to pricing for market
- Interviewed and developed recommendation for potential Owners Engineer vendors

BP

Project Manager

Chicago, IL

- December 2019 April 2022
- Directly managed 40+ resources and \$11 MM in contractor spend to conduct a 446-mile pipeline inspection- longest in BP history
- Managed a portfolio of \$13MM and 60+ resources across the U.S. to complete a high-profile HDD, 65 ILI repairs, reactivation of an idled asset, three active line valve replacements, and multiple ILI inspections
- Conducted multiple FEL studies to shape BPs Net Zero initiative which included multiple confidential Carbon Capture, Utilization, and Storage (CCUS) projects as well as a nationwide DOE funded hydrogen transportation system; presented to senior leadership for investment level decision leading to additional due diligence to align with BP net zero ambitions
- Created financial model to analyze carbon capture projects within the business unit to determine carbon break even pricing
- Optimized in line inspection run to reduce the volume of nitrogen emitted and reduced project spend by \$2 MM

Chicago, IL

Chicago, IL

Chicago, IL

March 2024- Present

October 2023- March 2024

April 2022- October 2023

- Collaborated with global procurement and leadership teams to develop and implement a change order tracking and feedback system to aggregate contractor non-conformance data for current and future negotiations, ~\$1 MM/ year in refunds
- Achieved highest level of internal conformance by implementing a self-verification process to audit project execution and ensure alignment with BP's Stage Gate process and identified future opportunities for KPI development and process improvements
- Established a standardized process for managing projects for pipeline repairs key stakeholder communications
- Utilized Power BI to develop a tool which tracked third party encroachments into pipeline ROW to inform front line operations

Williams Companies Inc.

Pittsburgh, PA

- Project Developer Sr.
 April 2017 December 2019
 Lead developer selected to analyze and execute over \$2 B of capital projects: gas and condensate gathering, compression, FERC regulated pipelines, gas processing, and fractionation facilities in Ohio River Supply Hub (ORSH)
 - Completed commercial deals across gathering and processing business resulting in over \$2 B in incremental EBITDA
 - Subject matter expert on Processing and Fractionation and expansion capital requirements for multiple M&A deals
 - Managed FERC open season process, rate case development, and corporate structure for NGL pipelines
 - Presented over \$500 MM in proposed capital projects for FY 2017-2019 within capital funding (CAPEX) gated process to senior leadership, board members, and commercial teams to ensure projects meet long term growth strategy
 - Developed discounted cash flow models for rate setting purposes for projects with CAPEX less than \$150 MM
 - Automated and streamlined forecasting model to include commercial scenarios, mitigating contractual risk, and reducing product over/undersell by 15%

Project Engineer III

December 2013 – April 2017

- Completed over \$650 MM in large capital projects from front end engineering and design (FEED), detailed design, construction support, operations turnover, and post project support
- Managed over \$5 MM in engineering contactors, resulting in engineering costs 10% below budget on average
- Provided engineering assistance for construction, including requests for information, commissioning and start-up support, and project deliverable turnover
- Designed, constructed, and commissioned the startup of multiple facilities, including compression, interconnects, pipelines, turbo expander, de-ethanizers, slug catcher, flare, stabilization, frac train, rail bays, and storage tanks
- Developed and ensured efficient execution of multiple company standards for engineering design reviews, Process Hazard Analysis, Layers of Protection Analysis, Management of Changes, Process Safety Startup Review, Alarm Rationalization, Factory Acceptance Tests, and Process Safety Management
- Member of steering committee that developed and implemented companywide standard for API 12F tanks

Pinnacle Asset Integrity Services (PinnacleAIS)

Project Lead

Pasadena, TX

May 2012 – November 2013

- Directly supervised and trained a team of seven consultants on NCRA site-specific procedures in multiple locations
- Oversaw the completion and project reporting of a Mechanical Integrity and Risk Based Inspection program at the National Cooperative Refinery Association (NCRA) Refinery in McPherson, KS
- Managed a total of four project budgets with a gross revenue of \$2 MM and gathered data for future proposal bids
- Implemented a companywide best practice for integration of PinnacleAIS Inspection Services with PinnacleAIS Services department for turnaround planning purposes

EDUCATION

Indiana University The Kelley School of Business, MBA, Finance Major Bloomington, IN August 2023

The Pennsylvania State University The College of Engineering, Bachelor of Science in Chemical Engineering University Park, PA May 2012

JUSTIN GUTKNECHT Head of Solutions NewCarbon LLC 1648 W Division Street, Unit 709, Chicago, IL 60622 312.576.8004 (phone), Justin.Gutknecht@newcarbon.energy

Education and Training

M.B.A., Accounting, Finance, and Strategy, Booth School of Business University of Chicago, 2017. B.S. Finance, University of Illinois at Urbana-Champaign, 2004. Chartered Financial Analyst (CFA), 2013–present.

Research and Professional Experience

- Lead structuring of clean energy infrastructure utilizing low carbon feedstocks, fuels and carbon capture technologies by providing commercial guidance to the project development, origination, engineering, and capital markets teams.
- Develop a near and long-term customer-focused decarbonization strategy by deploying energy infrastructure and technologies to achieve lifecycle carbon intensity reduction in manufacturing and production processes.
- Oversee a strategic execution plan incorporating an entire project lifecycle, from conception to commissioning. Include risk mitigation, managing commercial relationships, safety, scheduling, budgeting, and project finance transactional activities.
- Coordinate financing activities, including tax equity and debt financing, provide guidance on financial models, identify risks within contracts, and manage relationships with third-party financiers.

2021–2023: Director, Energy Origination and Development, TC Energy.

- Managed TCE Energy's origination and development of utility-scale renewable power projects and low-carbon infrastructure projects in the United States.
- Supervised a U.S. Origination and Development team covering structured origination, midmarketing, development, interconnection, permitting and land management functions.
- Led commercial negotiations, development, and execution efforts to establish a U.S. portfolio of wind, solar, hydrogen, clean fuels and carbon capture, transportation and sequestration projects.
- Led Federal and State Hydrogen and Carbon Capture funding opportunities totaling \$1 billion, receiving DOE grant awards for projects within the Heartland and ARCH2 Regional Hydrogen Hubs.

2017–2021: Senior Vice President, Finance and Development, Annova LNG.

- Led due diligence, development and execution efforts in multi-phase equity financings with joint venture partners and construction capital fundraising.
- Managed financial advisor, insurance advisor, and outside counsel engagements to support the bankability of terms and conditions of various project contracts and provided structuring advice.
- Led project development activities, including electrical interconnection, wholesale power procurement, dredging, local and state tax incentive negotiations, accounting and tax matters.

2015–2017: Principal, Generation Development Analytics, Exelon Corporation.

- Led financial evaluation and transaction execution support for acquisition and greenfield development of utility scale wind, solar and battery storage generation projects.
- Led development activities for battery storage, including site control, permitting, interconnection, engineering, technology evaluation, and offtake.

2011–2015: Manager, Financial Planning and Analysis, Evraz North America.

- Supervised on-site mill financial managers in monthly forecasting and annual budget processes and consolidated the financial results of the Tubular Product Division.
- Obtained approvals for capital investment projects and provided technical financial support and recommendations on the evaluation of potential alliances, acquisitions, capital investments, and other issues affecting operations.

2004–2011: Senior Financial Analyst, Corporate Development, Telephone and Data Systems Inc.

- Performed valuations for the acquisitions of wireless spectrum and acquisitions.
- Prepared presentations to bond-rating agencies, reviewed credit metric ratios based on rating agency methodologies, and analyzed strategic and financial initiatives to improve capital structure.

Professional Activities

Member, CFA Society of Chicago, 2013-present.

PHILLIP FRANSHAW

4205 Dickson Street, Houston, TX 77007 | (713)253-0690 | phillip.franshaw@newcarbon.energy

EXPERIENCE

NewCarbon—Houston, TX

Co-Founder & Head of Customer Engagement

- November 2023—Present Co-founded a clean energy infrastructure company that delivers lifecycle carbon intensity reduction through fit-for-purpose solutions that integrate across customers' value chains
- Lead deal structuring and contract negotiations while working collaboratively with legal, finance, engineering, and construction leads to optimize project economics and mitigate risk

TC Energy Corporation—Houston, TX

Origination Specialist, Power & Energy Solutions

- Led customer origination for United States low carbon platform including wind, solar, renewable natural gas, green hydrogen, and sustainable aviation fuel production
- Led deal structuring, negotiations, and execution of contracts to secure mutually beneficial agreements with equity partners, customers, and other project stakeholders

Exelon Corporation—Houston, TX

Senior Vice President & Co-Founder, Annova LNG, LLC October 2012—March 2021

- Co-founded a 6.5 MTPA greenfield liquefied natural gas (LNG) export company
- Led origination, structuring, and negotiation of long-term offtake contracts

713 Capital Partners—Houston, TX

Co-Founder & Principal

Co-founded municipal real estate consulting practice providing advisory and development management services

Cockrell Interests Inc.—Houston, TX

Managing Director

- Managed a diversified real estate portfolio for a family office
- Led structuring, negotiation, and execution in a portfolio of direct and indirect investments including wholly owned properties, joint ventures, and commingled funds

Hines Interest Limited Partnership—Houston, TX

Project Manager

Managed a global diversified real estate portfolio totaling \$2.1billion

The Coca-Cola Company—Atlanta, GA

Business Development Consultant—Houston, TX September 2001—September 2003 Led acquisition structuring, negotiation, and execution of premium juice drink company Business Development Manager—Atlanta, GA August 1995—February 1998

• Led acquisition structuring, negotiation, and execution of bottling assets totaling \$2.4 billion August 1992-August 1995 Principal Financial Analyst—Houston, TX

Led restructuring of \$2.0 billion operating division

Merrill Lynch Capital Markets—New York City, NY

Equity Trader

August 1986—August 1988

EDUCATION

The University of Texas at Austin

Master of Business Administration, Finance & International Business

Georgetown University

Bachelor of Arts, English

August 1992

June 2000-September 2001

May 1986

April 2021—November 2023

September 2007—March 2014

September 2003—September 2007

Brian Lammers 2437 Girard Avenue South Minneapolis, MN 55405 (612) 518-3798 brian.lammers@newcarbon.energy

Experience

Brian has more than 20 years of experience developing utility-scale renewable power, energy storage and HVDC transmission infrastructure in the United States and Canada. Brian held leadership positions at Exelon, EDP North America and RES Americas. During his career Brian has led origination, development and financing initiatives resulting in investment of more than \$6 Billion in low carbon power and energy solutions.

NewCarbon, Chicago, IL

Head of Feedstocks

January 2024 - Present

Founding partner of NewCarbon, a developer, owner and operator of fit-for-purpose solutions for agricultural and industrial customers to lower the lifecycle carbon intensity of their operations.

Advanced Generation Development, Minneapolis, MN

President and Founder

March 2017 – Present

- Originated, developed, and sold a 700 MW wind generation development portfolio to a leading US independent power producer
- Closed 850 MW of wind and solar power purchase agreements for midstream energy client, organized buy-side solicitation, evaluated proposals, led contract negotiations
- Led integration and development of 400 MW solar generation portfolio for power client
- Advisor for site identification and early-stage development of hydrogen production projects, two of which received \$1.85 billion in DOE Grant awards
- Led commercial offtake and development efforts for a private equity-backed 2100 MW merchant HVDC transmission project

Renewable Energy Systems, Minneapolis, MN

Vice President, Development

October 2017 – December 2018

- Closed power purchase agreements for 400 MW of wind and solar generation
- Held P&L responsibility for regional origination and development office
- Managed joint venture with leading US IPP resulting in construction of 1 GW of new wind and solar generation

Exelon Generation, Chicago, IL

Managing Director, Renewables and Technology Development

November 2011 - March 2017

• Led development and acquisition of 2 GW of wind and solar generation and battery storage, deploying ~\$3 billion in CapEx, and doubling the size of Exelon's renewable generation fleet

EDP Renewables N.A., Minneapolis, MN

Director of Development, Upper Midwest and Northeast U.S.

March 2008 – November 2011

- Completed development of more than 750 MW (~ \$1.5 billion) of wind generation
- Responsible for two regional development teams, fifteen staff, a 3 GW project pipeline and \$10 million annual budget in the Midwest and Northeastern U.S.

John Deere Finance, Johnston, IA

October 2006 – March 2008

- Led development of 500 MW (~ \$1 billion) of U.S. wind power generation projects
- Spearheaded transition from distributed-scale to utility-scale wind generation
- Developed and closed financing for the first multi-megawatt wind farm in Michigan

Gamesa Energy, Philadelphia, PA

September 2004 – October 2006

- Led development of more than 500 MW (~ \$1 billion) of US wind generation projects including the largest wind generation project constructed in Pennsylvania
- Opened and managed regional development office

Navitas Energy, Minneapolis, MN

November 1998 – September 2004

- Led origination, development, and completion of 250 MW (~ \$500 million) of wind generation
- Supported successful M&A efforts with U.S. and European IPPs

Education

University of Minnesota - Minneapolis, MN MBA

University of Wisconsin – Madison, WI Bachelor of Science

Community Involvement

American Red Cross, Twin Cities Chapter – Minneapolis, MN Board of Directors June 2023 - Present

City of Lakes Waldorf School, Minneapolis, MN Secretary, Board of Trustees Chair, Development Committee 2019 – Present

Clean Grid Alliance (fka Wind on the Wires), Saint Paul, MN Treasurer and Board Member 2010 – 2021

APPENDIX C

TAX LIABILITY STATEMENT

Industrial Commission Tax Liability Statement

Applicant:

Application Title:

Program:

 $\Box \mbox{Lignite Research, Development and Marketing Program}$

□ 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

Title

Date

APPENDIX D

CITATIONS AND BUDGET NOTES

CITATIONS

Francisco López, A., Lago Rodríguez, T., Faraji Abdolmaleki, S., Galera Martínez, M., & Bello Bugallo, P. (2024). From Biogas to Biomethane: An In-Depth Review of Upgrading Technologies That Enhance Sustainability and Reduce Greenhouse Gas Emissions. Retrieved from https://www.mdpi.com/2076-3417/14/6/2342.

ND Department of Agriculture, D. G. (n.d.). Retrieved from <u>https://www.ndda.nd.gov/sites/www/files/documents/files/2023%20ND%20Ag%20brochure.p</u> <u>df</u>

- Diane Mayerfeld, W. F. (n.d.). *Methane emissions from livestock and climate change*. Retrieved from University of Wisconsin- Madison: https://cropsandsoils.extension.wisc.edu/articles/methane-emissions-from-livestockand-climate-change/
- USDA. (2023). 2023 STATE AGRICULTURE OVERVIEW. Retrieved from https://www.nass.usda.gov/Quick_Stats/Ag_Overview/stateOverview.php?state=north%20 dakota

BUDGET NOTES

Salaries: Salary estimates are based on the scope of work and prior experience on projects of similar

scope. The labor rate used for specifically identified personnel is the current hourly rate for that

individual.

Fringe Benefits: Fringe benefits is calculated as 11.6% of gross salary which is calculated as the total of:

6.2% for Employer Social Security Withholding, 1.45% for Employer Medicare Withholding, 0.6% for

Employer Federal Unemployment Tax Withholding (FUTA), 0.85% for Employer State Unemployment

Tax Withholding (SUI), 2.5% for Paid Leave for All Workers.

Travel: Travel may include site visits, fieldwork, meetings, and conferences. Travel costs are estimated

and paid in accordance with OMB Uniform Guidance 2 CFR 200, Section 474. Daily meal rates are based on U.S. General Services Administration (GSA) rates. Other estimates such as airfare, lodging, ground transportation, and miscellaneous costs are based on a combination of historical costs and current market prices. Miscellaneous travel costs may include parking fees, Internet charges, long-distance phone, copies, faxes, shipping, and postage.

Supplies: Supplies include items and materials that are necessary for the research project and can be directly identified to the project. Supply and material estimates are based on prior experience with similar projects. Examples of supply items are chemicals, gases, glassware, nuts, bolts, piping, data storage, paper, memory, software, toner cartridges, maps, sample containers, minor equipment (value less than \$5000), signage, safety items, subscriptions, books, reference materials. General purpose office supplies (pencils, pens, paper clips, staples, Post-it notes, etc.) are included in the Supplies cost. **Communications:** Telephone, cell phone, and fax line charges are included in the Supplies cost; however, direct project costs may include line charges at remote locations, long-distance telephone charges, postage, and other data or document transportation costs that can be directly identified to a project. Estimated costs are based on prior experience with similar projects.