

GP Turnkey Tharaldson LLC

3549 153rd Ave. SE
Casselton ND, 58012

December 20, 2021

North Dakota Industrial Commission
State Capitol, 14th Floor
600 East Boulevard Ave Dept 405
Bismarck, ND 58505-0840

Subject: Submission of NDIC Renewable Energy Program Grant Application

Dear Members of the Renewable Energy Council:

Please Accept the attached proposal titled "MSC™ High Protein Project", submitted on behalf of GP Turnkey Tharaldson, LLC for your consideration for Renewable Energy Program grant funding.

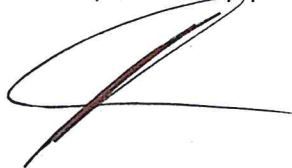
GP Turnkey Tharaldson, LLC, a new joint venture with Tharaldson Ethanol Plant I, LLC and Green Plains, Inc., will introduce MSC™ High Protein technology. The proposed project will take place on the property of the Tharaldson Ethanol facility located in Casselton, North Dakota.

The project entails the integration of the innovative turnkey solution of Fluid Quip Technologies' MSC™ protein technology to produce a high purity protein product that trades in the alternative high-value protein market. The new technology is not presently used in the ethanol production process in North Dakota and is designed to improve flexibility and profitability by producing higher-value proteins (50% or greater) and corn oil in a sustainable manner. The project has a high potential to affect the broader North Dakota renewable energy industry by helping to establish a proven and marketable new technology option with co-products, as well as preserving and creating renewable energy jobs both to support the operations of the facility along with local services that will be used to assist GP Turnkey Tharaldson. The growth in coproducts production will increase the need for corn feedstock from local agricultural producers. Agricultural producers will have more access to coproducts like dried distillers' grains and corn oil for livestock feed, provided by MSC™ process. The integration of this system will maximize the market potential for renewable energy resources, materials and products, and the associated byproducts.

As General Manager, I will serve as Principal Investigator and Corey Aanenson, EH&S Manager will be the primary contact for the project.

GP Turnkey Tharaldson, LLC hereby commits to complete this project as described in the attached proposal.

If you have any questions, please contact me or Corey Aanenson.



Ryan Carter
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Renewable Energy Program

North Dakota Industrial Commission

Application

Project Title: MSC™ High Protein Project

Applicant: GP Turnkey Tharaldson, LLC

Principal Investigator: Ryan Carter, General Manager

Date of Application: January 21, 2022

Amount of Request: \$500,000

Total Amount of Proposed Project:
\$80,322,468

Duration of Project: November 2021 through
November 2022

Point of Contact (POC): Corey Aanenson, EH&S
Manager.

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POC Address: 3549 153rd Ave SE, Casselton,
ND 58012

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ABSTRACT

Objective:

The purpose of this proposal is to request funds from the North Dakota Industrial Commission (NDIC) Renewable Energy Program to assist GP Turnkey Tharaldson, LLC, a new joint venture with Green Plains, Inc. and Tharaldson Ethanol Plant I, LLC, with the integration of the MSC™ High Protein Project. The MSC™ high protein project is designed to implement equipment to generate a high-grade protein product from whole stillage that will trade at a value substantially higher than DDGS. The MSC™ High Protein will be made using Maximized Stillage Co-Products (MSC) Technology, which was developed and patented by Fluid Quip Technologies (FQT). The protein has shown great success in the pet food, aqua, dairy, poultry, and swine markets. The coproducts that will be produced will be sold to North Dakota companies, nationally, and internationally. The goal for GP Turnkey Tharaldson, LLC is to accelerate the reinvention of the biofuels industry. New jobs will be created with this project to support the operations of the facility along with local services that will be used to assist GP Turnkey Tharaldson, LLC.

Expected Results:

The integration of the patented MSC™ High Protein technology is expected to produce 105,000 tons at capacity. Currently this higher-value protein (52% protein) is not available in North Dakota. Integrating the innovative turnkey solution of Fluid Quip Technologies' MSC™ protein technology at the North Dakota facility will improve flexibility and profitability by producing higher-value proteins and corn oil in a sustainable manner. The MSC™ High Protein technology is proven to produce Dried Distillers Grains (DDGS) with 60% protein or more. The integrated system will have this capability. The adjacent Tharaldson Ethanol facility's ethanol production volume will be unchanged as a result of the MSC™ project. MSC™ is being designed to support 160 million gallons per year nameplate with a maximum production of 180 million gallons per year of ethanol production.

The MSC™ High Protein technology will provide innovation and efficiency and has the potential for replication at other ethanol production facilities. The project has high potential to affect the broader North Dakota renewable energy industry by helping to establish a proven and marketable new technology option, as well as preserving and creating renewable energy jobs, wealth, and tax revenue. The high purity protein will maximize the market potential for renewable energy resources, materials and products, and the associated byproducts. The project revenue is estimated at \$30 million for the first year and \$43 million for each year consecutively.

Duration:

The construction, installation, and testing of the MSC™ High Protein Project will be November 2021-November 2022.

Total Project Cost:

Total project cost, including architectural and engineering expenses, is estimated at \$80,322,468. The cost of all tangible personal property that is considered buildings and construction materials sum to \$23,825,875. The cost of machinery and manufacturing equipment used directly in the manufacturing process (excluding installation costs or engineering costs) sum to \$32,318,875. Consulting, Engineering, and startup salaries are budgeted at \$4,462,325.

Participants:

GP Turnkey Tharaldson, LLC is a partnership between Tharaldson Ethanol Plant I, LLC based in Casselton, ND, and Green Plains, Inc. based in Omaha, NE. The joint venture to produce and market the Ultra-High Protein distillers grains using MSC™ process will be produced and distributed from the Tharaldson plant in Casselton, ND. Tharaldson Ethanol will be managing production and provide 50% capital. Green Plains, Inc. will be providing its partner up to 50% capital, marketing, quality assurance, and quality control of the Fluid Quip Technologies' MSC™ protein, as well as project management and development of the Ultra-High Protein and post- MSC™ distillers grains products, and future technology innovation. Tharaldson Ethanol is the first turnkey partner and is excited to be the first in line to access this novel turnkey solution.

PROJECT DESCRIPTION

Objectives:

The MSC™ High Protein project will accelerate the reinvention of the biofuels industry. The potential value to the renewable energy industry will provide an improvement to the flexibility and profitability in the industry by producing higher-value proteins (50% or greater) and corn oil in a sustainable manner. The construction and implementation of MSC™ High Protein Project will begin in November 2021 through November 2022, with full operations expected in January 2023.

This will provide both short-term and long-term benefits to GP Turnkey Tharaldson, the North Dakota renewable energy industry, and North Dakota renewable energy developers. The MSC™ High Protein project brings an added value to GP Turnkey Tharaldson, LLC by improving flexibility and profitability in the process to produce higher-value proteins for the market and maximize the market potential for renewable energy resources, materials and products, and the associated byproducts. The MSC™ High Protein system will provide innovation and efficiency and have the potential for replication at other ethanol production facilities in North Dakota by establishing a proven and marketable new technology option. This will bring opportunity for growth with other renewable energy developers to implement the MSC™ High Protein system and gain flexibility and profitability as the developers are propelled into the new technology to set the stage for future innovations.

The MSC™ High Protein project will also provide short-term and long-term benefits to the landowners, agriculture producers, and the counties in North Dakota. The project has a high potential to create economic stability and growth and the creation of jobs related to the production and utilization of North Dakota's biomass resources. The growth in coproducts production will increase the need for corn feedstock from local agricultural producers. Tharaldson provides a much-needed local market for area corn growers, requiring about 54 million bushels of corn annually for target DDGS production. Local agricultural producers will have more access to coproducts like dried distillers' grains and corn oil for livestock feed, provided by MSC™ process.

The level of matching funds for the project will be provided jointly from Green Plains, Inc. and Tharaldson Ethanol Plant I, LLC. Both partners are pledging 50% each on capital in addition to the agreed upon working obligations. In addition to pledged capital, Tharaldson Ethanol will be managing production at the Casselton, ND plant for GP Turnkey Tharaldson, LLC. Green Plains, Inc. will be providing marketing, quality assurance, and quality control of the Fluid Quip Technologies' MSC™ High Protein, as well as project management and development of the Ultra-High Protein and post- MSC™ distillers grains products, and future technology innovation.

The joint venture is bringing together two successful and proven Ethanol companies with excellent talent and experience (See Appendix for detail on background and qualifications of the management team). In addition to the merge of highly experienced management teams, GP Turnkey Tharaldson will be hiring a total of 15 new jobs specifically created for the MSC™ High Protein Project. We estimate that one manager will be added that will have a salary of \$100,000, one maintenance employee that is around \$30 hourly, and thirteen operators around \$25-\$30 hourly. The construction of the new project will utilize local contractors for the build and local services for contractors and vendors. One-hundred and fifty construction contract employees will be utilized for the build of the project.

The MSC™ High Protein project has been tested and proven with Fluid Quip Technologies and Green Plains, Inc. The innovative process is ready to be implemented under the joint venture of GP Turnkey Tharaldson. Since the MSC™ High Protein project is a turnkey project, it doesn't require any major testing or improvements before being able to run as a proven process at GP Turnkey Tharaldson facility. After construction, there will be a short-time period for commissioning with start-up of production immediately following.

Methodology:

Joint Venture

The joint venture to produce and market the Ultra-High Protein distillers grain using MSC™ process will be produced and distributed from the Tharaldson plant in Casselton, ND. Tharaldson Ethanol will be managing production and provide 50% capital. Green Plains, Inc. will be providing its partner up to 50% capital, marketing, quality assurance, and quality control of the Fluid Quip Technologies' MSC™ High Protein system, as well as project management and development of the Ultra-High Protein and post- MSC™ distillers grains products, and future technology innovation. Tharaldson Ethanol and Green Plains will provide a collaboration of innovation, technology, and expertise in GP Turnkey Tharaldson. The project managers and employees of GP Turnkey Tharaldson are prepared to oversee the installation of the system and conduct the subsequent research through the daily monitoring practices already established. A strong and experienced team of experts will manage the development of the project, oversee the research, and ensure the successful execution of the project with the established deliverables.

Facility Construction

Integration of the MSC™ High Protein project will include construction of new buildings and installation of equipment to be added to the existing ethanol plant located in Casselton, ND. A new process building to house the MSC™ process will be installed south of the existing wet pad of Tharaldson Ethanol. The new process building will house FQT equipment, protein decanters, tanks, pumps, and agitators. The building will also have a control room and simple lab area. A new MCC room will be installed adjacent to the MSC™ process building to provide electrical power for all equipment in the building and dryer. The MCC room will also house the switchgear and circuit breakers necessary to power the MSC process equipment. Another MCC room will be installed at the new truck storage and loadout facility and the new rail loadout facility which will house the switchgear and breakers required to power the loadout equipment.

Piping, ducting, and conveyors between the MSC™ building and existing plant facilities will be supported by new racks. The conveyors between the MSC™ building and the dryers will be supported by a new bridge, including a walkway. Three (3) 700-ton silos will be installed to allow for about 7 days of product storage. The silos are designed to reclaim the product at a rate of 100 Ton/h. Loadout facilities will be provided for both bulk truck and rail car. A typical truck / trailer length will be used for loadout design. The rail loadout facility will be located near the existing rails along the east side of the site adjacent to the truck loadout. The standard rail cars hold 100 tons of product each.

Some existing equipment at the Tharaldson Ethanol Facility will be used in the MSC™ process. The existing steam boiler and whole stillage tank will be used in the MSC™ System. The existing natural gas header after main pressure reduction station is expected to be adequate to provide gas to new dryers. The whole stillage tank in existing Tharaldson Ethanol Facility and will be used in the MSC™ System.

Process

The MSC™ High Protein will be made using Maximized Stillage Co-Products (MSC) Technology, which was developed and patented by Fluid Quip Technologies (FQT). Very few ethanol plants in the country currently produce this product. Corn will continue to be the feedstock used to produce the ethanol, in the adjacent Tharaldson Ethanol facility, and thus the ultra-high protein co-product. Once fermentation and distillation of ethanol occurs, the slurry leaving the bottom of the columns for whole stillage contains the oil, protein, fiber, and other unfermented components of the grains and yeast cells. Special protein feed tanks, dryers, and decanters are used in this confidential patented process to make the MSC™ High Protein. The protein product will transfer directly to the silos. The silos will discharge to a drag conveyor, which will feed a bucket elevator. The bucket elevator will feed a drag conveyor that will gravity discharge and be diverted to either truck or rail loadout then through magnets at each location.

Efficiencies in Production

Integrating the patented MSC™ technology at the Casselton ethanol facility will improve the company's flexibility, profitability, and sustainability. The system will produce a higher-value proteins (at 52% protein with proven

potential to increase to 60%) and 20% increase in corn oil yield in a sustainable manner. The facility is designed to run 355 days per year with a 10% plant throughput gain. The process water is designed to be used as seal water for all pumps. The MSC™ process will enable more corn oil to be recovered as follows (provided down streams system (i.e. syrup oil decanter) can fully capture the additional free oil generated with the MSC™ system.) This project will also result in an approximate 65% protein decanter collection efficiency on insolubles, as well as an approximate 10% capture efficiency on solubles. GP Turnkey Tharaldson expects to benefit from Ultra-High Protein and renewable corn oil value creation, with no additional ethanol margin exposure. GP Turnkey Tharaldson management team will document and analyze results for efficiency statistics.

Anticipated Results:

The MSC™ High Protein project is designed to implement equipment to generate a higher-grade protein product (50% or greater) from whole stillage that will trade at a value substantially higher than DDGS. The target for this project is to generate a nominal rate of 3.5 lb/bu of protein product at 7-8% moisture. The amount of DDGS produced will decrease as protein is being removed from whole stillage. The new DDGS stream from the DDGS dryers will have pro-fat close to 28% when the 52% protein product is at design yield. The future estimated DDGS will be 9.23 lb/bu.

The backend of the ethanol production process is expected to yield approximately 1.1 lb/bu of oil with the implementation of the patented MSC™ technology. No accommodation for additional de-oiling or storage of final oil product is planned as part of the detailed engineering deliverables. The use of emulsion breakers may still be required to get higher oil yields. The MSC™ process will enable more corn oil to be recovered from previous yield of 0.80 lb/bu to 1.10 lb/bu, provided down streams system (i.e. syrup oil decanter) can fully capture the additional free oil generated with the MSC™ system.

The integration of the patented MSC™ High Protein technology is expected to produce 105,000 tons at capacity. Currently this higher-value protein (50% protein or greater) is not available in North Dakota. Integrating the innovative turnkey solution of Fluid Quip Technologies' MSC™ High Protein technology at the North Dakota facility will improve flexibility and profitability by producing higher-value proteins and corn oil in a sustainable manner. The MSC™ High Protein technology is proven to produce Dried Distillers Grains (DDGS) with 50%- 60% protein or more. The integrated system will have this capability. The adjacent Tharaldson Ethanol facility's ethanol production volume will be unchanged as a result of the MSC™ project. MSC™ is being designed to support 160 million gallons per year nameplate with a maximum production of 180 million gallons per year of ethanol production.

The MSC™ High Protein technology will provide innovation and efficiency and has the potential for replication at other ethanol production facilities. The project has high potential to affect the broader North Dakota renewable energy industry by helping to establish a proven and marketable new technology option, as well as preserving and creating renewable energy jobs, wealth, and tax revenue. The protein has shown great success in the pet food, aqua, dairy, poultry, and swine markets, and will maximize the market potential for renewable energy resources, materials and products, and the associated byproducts. The project revenue is estimated at \$30 million for the first year and \$43 million for each year consecutively.

Facilities:

Tharaldson Ethanol Plant I, LLC is an ethanol plant located just west of Casselton, ND. Ethanol Casselton facility has been in operation since 2009 and currently produces 153 MMGY of ethanol. The proposed MSC™ system will be constructed on the existing real property of Tharaldson Ethanol facility in Casselton, ND.

Resources:

The joint venture of Tharaldson Ethanol and Green Plains will provide the innovation, technology, expertise, and capital to have a successful integration and operation of the MSC™ High Protein Project. Internally, project managers and employees of both Tharaldson Ethanol and Green Plains are prepared to oversee the installation of the system and conduct the subsequent research through the daily monitoring practices already established. A strong and experienced team of experts will manage the development of the project, oversee the research, and ensure the successful execution of the project.

Techniques to Be Used, Their Availability and Capability:

The MSC™ High Protein will be made using Maximized Stillage Co-Products (MSC) Technology, developed and patented by Fluid Quip Technologies (FQT). Corn will continue to be the feedstock used to produce the ethanol, at the adjacent Tharaldson Ethanol facility, and thus the ultra-high protein co-product. Special protein feed tanks, dryers, and decanters are used in this confidential process to make the MSC™ High Protein. The protein product will transfer directly to the silos. The silos will discharge to a drag conveyor, which will feed a bucket elevator. The bucket elevator will feed a drag conveyor that will gravity discharge and be diverted to either truck or rail loadout then through magnets at each location.

Integrating the MSC™ High Protein technology will produce higher-value proteins (at 50% protein or greater), that trades in the alternative high-value protein market that is not currently available in North Dakota, and 20% increase in corn oil yield in a sustainable manner. The facility is designed to run 355 days per year with a 10% plant throughput gain. Once construction is completed, this project is expected to produce 105,000 tons at capacity. The protein has shown great success in the pet food, aqua, dairy, poultry, and swine markets. The innovative MSC™ High Protein system has a high potential for preserving and creating renewable energy jobs, wealth, and tax revenues for North Dakota, and maximizing the market potential for renewable energy resources, materials and products, and the associated byproducts.

Environmental and Economic Impacts while Project is Underway:

The installation of the MSC™ system does not present any adverse ecological or economic impacts. Based on soil borings and geotechnical report, there are no adverse soil conditions within the project construction area. Ethanol production at the adjacent Tharaldson Ethanol facility uses low water consumption per gallon of ethanol produced and no use of area groundwater resources as the facility uses the City of Fargo's wastewater to operate. These practices will be applied at GP Turnkey Tharaldson in The MSC™ system when possible and positively affects the environment through water conservation. In addition to water conservation, there will be no net gain on emissions.

The MSC™ High Protein system economically will create renewable energy jobs for the area, work with local corn growers, and bring higher-protein feed into the market. Tharaldson Ethanol provides a much-needed local market for area corn growers, requiring about 54 million bushels of corn annually for target DDGS production. The growth in coproducts production will increase the need for corn feedstock from local agricultural producers. Additionally, agricultural producers will have more access to coproducts like dried distillers' grains and corn oil for livestock feed, provided by MSC™ process. The high purity protein will maximize the market potential for renewable energy resources, materials and products, and the associated byproducts.

Ultimate Technological and Economic Impacts:

The proposed project promotes the development of the state's renewable fuels industry through a technology that improves flexibility and profitability and accelerates the reinvention of the biofuels industry. Moreover, the production of the high purity protein provides opportunity for replication at other ethanol plants that may implement the installable technology in the future, providing potential for renewable energy job creation both to support the operations of the facility along with local services that will be used to support the facility. Renewable energy industries in North Dakota have not yet implemented the MSC™ process. Currently this high protein is not available in North Dakota and only available from Iowa. When the technology is implemented, the North Dakota renewable fuels industry will be supporting the introduction of a system improvement that promotes positive economic and environmental impact while encouraging the use of new technologies within the renewable fuels industry.

The MSC™ High Protein system economically will create renewable energy jobs for the area and bring new technology to North Dakota Ethanol Industry. The project has high potential to affect the broader North Dakota renewable energy industry by helping to establish a proven and marketable new technology option, as well as

preserving and creating renewable energy jobs, wealth, and tax revenue. A total of 15 new jobs will be created due to the MSC™ High Protein project. We estimate that one manager will be added that will have a salary of \$100,000, one maintenance employee that is around \$30 hourly, and thirteen operators around \$25-\$30 hourly. The construction of the new project will utilize local contractors for the build and local services for contractors and vendors. One-hundred and fifty construction contract employees will be utilized for the build of the project. The project revenue is estimated at \$30 million for the first year and \$43 million for each year consecutively.

Why the Project is Needed:

The high protein project is a new product with innovative new technology for which very few ethanol plants currently produce. Tharaldson is one of two major competitors in this market and, there is a huge market available with many customers. Currently this high protein is not available in North Dakota and only available from Iowa. This project will produce a high purity protein product that trades in the alternative high-value protein market and has shown great success in the pet food, aqua, dairy, poultry, and swine markets.

The MSC™ High Protein technology will provide innovation and efficiency and has the potential for replication at other ethanol production facilities. The project has high potential to affect the broader North Dakota renewable energy industry by helping to establish a proven and marketable new technology option, as well as preserving and creating renewable energy jobs, wealth, and tax revenue. The high purity protein will maximize the market potential for renewable energy resources, materials and products, and the associated byproducts. The project revenue is estimated at \$30 million for the first year and \$43 million for each year consecutively.

STANDARDS OF SUCCESS

GP Turnkey Tharaldson's MSC™ High Protein project at the Casselton ethanol facility will produce higher-value proteins (at 50%-60% protein or greater) and 20% increase in corn oil yield in a sustainable manner. The purpose of the MSC™ process is to generate a high-grade protein product from whole stillage in a sustainable manner that will trade at a value substantially higher than DDGS. The main deliverables of the MSC™ High Protein project include construction/installation, commissioning, start-up, and continued operation.

The first set of objectives in the project is to construct and install the MSC™ High Protein system. Integration of the MSC™ High Protein system will include construction of new buildings and installation of equipment to be added to the existing ethanol plant located in Casselton, ND. Once the installation is complete, GP Turnkey Tharaldson's team will collect data from the commissioning of the MSC™ system. The GP Turnkey Tharaldson Lab Representative will be analyzing the data for the project report and reporting information to the management team. The data collection will allow the management team to analyze the production process to ensure the objectives of the project are being met.

The second set of objectives includes start-up and continued operations. The GP Turnkey Tharaldson's team will collect data from the start-up to ensure objectives are being met and will continue to collect data on continued operations to ensure deliverables are met while looking for efficiency opportunities. The deliverables of the project to determine start-up and operational success include the following targeted production goals.

- Production of high-value protein (52% protein increasing to 60% or greater)
- New DDGS stream will have pro-fat close to 28%
- generate a nominal rate of 3.5 lb/bu of protein product at 7-8% moisture
- more corn oil to be recovered from previous yield of 0.80 lb/bu to 1.10 lb/bu provided down streams system (i.e. syrup oil decanter) can fully capture the additional free oil generated with the MSC™ system.
- 10% plant throughput gain
- produce 105,000 tons at capacity
- Production to run 355 days per year

The MSC™ High Protein system will bring new technology to North Dakota Ethanol Industry, bring higher-protein feed into the market, increase need for corn feedstock from local corn growers, and create renewable energy jobs for the area. The MSC™ system will provide innovation and efficiency and have the potential for replication at other ethanol production facilities in North Dakota by establishing a proven and marketable new technology option. This will bring opportunity for growth with other renewable energy developers to implement the MSC™ system and gain flexibility and profitability as the developers are propelled into the new technology to set the stage for future innovations. This will increase the potential for new jobs in the state’s renewable energy industry. A total of 15 new jobs will be created due to the MSC™ High Protein Project operations. We estimate that one manager will be added that will have a salary of \$100,000, one maintenance employee that is around \$30 hourly, and thirteen operators around \$25-\$30 hourly. The construction of the new project will utilize local contractors for the build and local services for contractors and vendors. One-hundred and fifty construction contract employees will be utilized for the build of the project.

The MSC™ High Protein Project will also provide short-term and long-term benefits to the landowners, agriculture producers, and the counties in North Dakota. The growth in coproducts production will increase the need for corn feedstock from local agricultural producers. Tharaldson Ethanol provides a much-needed local market for area corn growers, requiring about 54 million bushels of corn annually for target DDGS production. Local agricultural producers will have more access to coproducts like dried distillers’ grains and corn oil for livestock feed, provided by MSC™ process. The project has potential to affect the broader North Dakota renewable energy industry by helping to establish a proven and marketable new technology option, as well as preserving and creating renewable energy jobs, wealth, and tax revenue.

BACKGROUND/QUALIFICATIONS

Background and qualifications of the individuals and entities that will be involved in the MSC™ High Protein Project can be found in Appendix A attached to this grant application. See chart below for summary.

Table 1: Individuals/Entities involved in MSC™ High Protein Project

Individual / Entity	Role
GP Turnkey Tharaldson, LLC	Applicant for NDIC Grant
Tharaldson Ethanol Plant I, LLC	50% Partner of GP Turnkey Tharaldson, LLC
Green Plains, Inc.	50% Partner of GP Turnkey Tharaldson, LLC
Ryan Carter	General Manager, Project Management, Data Analytics
Corey Aanenson	Environmental Health & Safety, Project Management
Ryan Thorpe	COO, Project Management, Data Analytics
Danum Hofland	Project Management, Data Analytics
To be Hired	Operations Manager, Data Analytics, Maintenance Management
Kipp Stevens	Laboratory Manager, Document and Analyze Data
Fagen, Inc.	General Contractor, Project Installation Management
Jacob Clements	Fagen, Inc. Project Manager, Project Installation Management
Greg Canterbury	Fluid Quip Project Manager, Project Installation / Construction Management

MANAGEMENT

Table 2: GP Turnkey Tharaldson, LLC's Management Team

Management Team Member	Role
Ryan Carter	General Manager, Project Management, Data Analytics
Corey Aanenson	Environmental Health & Safety, Project Management
Ryan Thorpe	COO, Project Management, Data Analytics
Danum Hofland	Project Management, Data Analytics
To be Hired	Operations Manager, Data Analytics, Maintenance Management
Kipp Stevens	Laboratory Manager, Document and Analyze Data

Ryan Carter, General Manager, will take on the role of Principal Investigator. Ryan will work together with will Corey Aanenson, Ryan Thorpe, and Danum Hofland, and an Operations Manager to oversee the entirety of the project, to report on the documented data, and analyze overall results. The Operations Manager along with Ryan Carter and Corey Aanenson will oversee employee management and training. Training will include sending employees to a running plant for onsite training before starting the GP Turnkey Tharaldson plant. Additionally, Corey Aanenson will manage Environmental Health & Safety of the project. Project construction and installation will be managed by Jacob Clements, the Project Manager with Fagen, Inc., and Greg Canterbury, Construction Manager with Fluid Quip Technologies. Ryan Carter and Danum Hofland, will oversee all construction and installation activities working together to manage the contractors.

The Operations Manager is scheduled to be hired in summer 2022 and will manage the employees and the MSC™ High Protein Project operators to ensure that the production process is running as intended with the new technology. Operations Manager will also oversee the maintenance of the system to ensure that the facility is running optimally. Operations Manager will be responsible for training employees on the proper function and maintenance of the MSC™ High Protein system. Green Plains, Inc. has delivered a technology that is simple to maintain and operate. The team will ensure that maintenance during and after the project is completed on a routine schedule for the MSC™ High Protein system to operate at full capacity.

Kipp Stevens, the Tharaldson Ethanol Lab Representative, will oversee the evaluation and data collection acquired from the testing of the MSC™ High Protein system. Mr. Stevens will be analyzing the data for the project report and reporting information to the management team. The data collection will allow the management team to analyze the production process to ensure the objectives of the project are being met.

GP Turnkey Tharaldson's team has set protocols, standard operating procedures, and evaluation points to ensure the success of the project startup and operation. The GP Turnkey Tharaldson management and team members are prepared to oversee the installation of the system and conduct the subsequent research through the daily monitoring practices already established. The integration of the MSC™ High Protein system will be closely evaluated by the management team based on construction and startup deadlines. Once construction is completed, this project is expected to produce 105,000 tons at capacity. Integrating the patented MSC™ High Protein technology at the Casselton ethanol facility will produce a higher-value proteins (at 50%-60% protein or greater) and 20% increase in corn oil yield in a sustainable manner. The facility is designed to run 355 days per year with a 10% plant throughput gain. This high protein project is estimated to bring revenue of \$30 million for the first year and \$43 million in revenue for each year consecutively.

TIMETABLE

GP Tharaldson Turnkey, LLC developed the following timeline based on the identified objectives and activities for the proposed project. GP Turnkey Tharaldson project team developed the schedule to keep the workflow on track and to set feasible deadlines with realistic project progress and deliverables.

Table 3: MSC™ High Protein Project Timeline

Start Date	Completion Date	Activity
May 27, 2021	November 29, 2021	Project Kickoff and Planning
November 30, 2021	December 31, 2021	Construction Start
January 1, 2022	June 1, 2022	Construction Progress
June 1, 2022	June 15, 2022	Status Report #1 Submission
June 1, 2022	November 18, 2022	Construction Progress
November 19, 2022	December 19, 2022	Construction Completion
October 21, 2022	January 4, 2022	Commissioning
December 20, 2022	January 5, 2022	Status Report #2 Submission
January 5, 2023	February 2, 2023	Start Up
February 1, 2023	February 15, 2023	Final Report Submission

BUDGET

Table4: MSC™ High Protein Project Budget

Project Associated Expense	NDIC's Share	Applicant's Share (Cash)	Applicant's Share (In-Kind)	Other Project Sponsor's Share
Consulting/Engineering/Salaries	\$500,000	\$3,962,325		
Marketing & Advertising		\$601,035		
Buildings & Materials		\$25,736,625		
Buildings & Materials Installation		\$9,629,931		
Equipment		\$27,988,361		
Equipment Installation		\$500,000		
Dryer Siding Equipment & Installation		\$250,000		
Truck Loadout Equipment		\$7,055,471		
Truck Loadout Installation		\$165,770		
Rail Loadout Equipment		\$3,692,256		
Rail Loadout Installation		\$240,695		
Subtotals	\$500,000	\$79,822,468		
Total Projected Budget	\$80,322,468			

Applicant's Share of Cash is provided from the joint venture of 50% contributed capital by Green Plains, Inc. and 50% contributed capital by Tharaldson Ethanol Plant I, LLC.

Budget Justification

Engineering/Consulting/Salaries – Total consulting, engineering, and salaries costs are estimated at \$4,462,325. All budgeted Engineering, Consulting, and Salaries expenses are directly related to the MSC™ High Protein project. One-hundred and fifty construction contract employees will be utilized for the build of the project.

Engineering – The engineering cost include an Operations Manager, Process Engineering Technical Advisor, and a Design Technical Advisor, Architectural Designer, Electrical Designer, QA/QC Engineers, and Commissioning Management & Engineers. These engineering services are expected to be needed for 10 months. Hourly rate is estimated at \$170 per hour for a budgeted total of 26,250 hours for all engineers.

Consultant Fees – GP Turnkey Tharaldson has selected Fagen, Inc. as exclusive general contractor to construct and install Fluid Quip Technologies' MSC system for its biorefining platform. Fagen, Inc. is a premier, full-service EPC

contractor, which has constructed 60% of the ethanol production capacity in the U.S. They are a premier engineering and construction firm in the biorefining space with an unrivaled history as a high quality, reliable construction partner capable of large scale, duplicative, and complex project management. Fagen Inc. is the exclusive third party for the engineering/consultant service costs.

Salaries – It is estimated that a total of 15 new jobs will be created due to MSC™ High Protein project. We estimate that one manager will be added that will have a salary of \$100,000, one maintenance employee that is around \$30 hourly, and thirteen operators around \$25-\$30 hourly. These will all be full-time employees.

Marketing & Advertising – Green Plains (GP) has introduced a new turnkey solution for MSC protein technology and Tharaldson Ethanol will be GP's first turnkey partner. These two entities formed a joint venture, GP Turnkey Tharaldson, for which GP will provide all product marketing, quality assurance and quality control (QA/QC), project management, and future technology innovation. Green Plains is Tharaldson's exclusive marketer; therefore, GP will be advertising and marketing this new product for Tharaldson. All budgeted marketing and advertising expenses are directly related to the MSC™ High Protein project at \$601,035.

Construction, Installation, and Equipment – Various equipment will need to be installed at the ethanol plant in Casselton, ND. The cost of machinery and manufacturing equipment (including construction and installation) used directly in the manufacturing process for the MSC™ High Protein project sum to \$39,892,552 and construction/buildings/installation sum to \$35,366,555 for a total buildings and equipment cost of \$75,259,108. Due to the joint venture agreement, Green Plains is paying for 50% capital and the remaining 50% capital will be provided by Tharaldson Ethanol. Some examples of new equipment include the following: protein dryer, protein storage silos and loadout facilities for both bulk truck and rail car, new piping, ducting, and conveyors between the MSC building and existing plant facilities will be supported by new racks, etc. Other construction related costs include soil corrections, painting, coating, electrical install, outdoor switch and transformers, construction management fee, freight, owner's contingency, and equipment tariffs. All equipment, construction, and installation are directly related to the MSC™ High Protein project.

APPENDIX A: BACKGROUND/QUALIFICATIONS

The following section provides the individuals/entities that will be involved in the MSC™ High Protein project and details their background and qualification for the project.

GP Turnkey Tharaldson, LLC – Applicant

GP Turnkey Tharaldson, LLC is a joint venture between Green Plains, Inc. and Tharaldson Ethanol Plant I, LLC. Green Plains will provide its partner up to 50% of capital, as well as marketing and product development of the Ultra-High Protein and post-MSCTM distillers grains products, and utilization of Green Plains' exclusive partnerships and internal expertise to help maximize product value. Tharaldson Ethanol Plant I, LLC. will provide its partner up to 50% of capital and will be managing production at the Tharaldson Ethanol Plant located in Casselton, ND. GP Turnkey Tharaldson is the first turnkey partner and is excited to be the first in line to access this novel turnkey solution.

Tharaldson Ethanol Plant I, LLC – 50% Partner of GP Turnkey Tharaldson, LLC

Tharaldson Ethanol is a 175 million-gallon-per-year ethanol plant that is located west of Casselton, ND, an area known for its rich farming tradition. Tharaldson Ethanol is the nation's seventh largest ethanol facility, and produces a high-octane, clean burning fuel that reduces our nation's dependence on foreign oil, while utilizing locally grown, renewable agricultural resources. About 450,0000 tons of dried distiller's grains are produced as a co-product of the dry mill ethanol production at the Casselton Facility. Tharaldson's state-of-the-art facility has the latest, most innovative and energy efficient technology in the marketplace. Tharaldson's facility and production includes low natural gas consumption per gallon of ethanol produced due to reusing energy throughout the facility, low water consumption per gallon of ethanol produced, no use of area groundwater resources as the facility uses the City of Fargo's wastewater to operate, excellent state highway and interstate access combined with direct access to both the BNSF Railway and the Red River Valley & Western Railroad, proving the plant with efficient means of transporting both inbound and outbound commodities, and extensive grain storage infrastructure including a grain dryer to accommodate wet corn. Tharaldson Ethanol will provide GP Turnkey Tharaldson, LLC up to 50% of capital and will be managing production of the MSC™ High Protein project.

Green Plains, Inc. – 50% Partner of GP Turnkey Tharaldson, LLC

Green Plains, Inc., formed in 2004 as an ethanol producer, is headquartered in Omaha, Nebraska and is a leading biorefining company that develops and utilizes technologies to process annually renewable crops into more sustainable, high-value ingredients. Green Plains has introduced Ultra-High Protein using Fluid Quip Technologies' patented Maximized Stillage Co-products (MSC™) system to implement sustainable practices that allows production of Ultra-High Protein at scale without requiring additional land for feedstock production. Green Plains will provide GP Turnkey Tharaldson, LLC up to 50% of capital, as well as marketing and product development of the Ultra-High Protein and post-MSCTM distillers grains products.

Fluid Quip Technologies – Developer of the MSC™ High Protein System

Fluid Quip Technologies (FQT) was founded on extensive experience and know-how within the corn wet milling and ethanol production industries. FQT's chemical and mechanical engineering and technical leadership team has been developing new technologies and process solutions applicable to the biofuels and biochemical industries for more than 25 years. FQT has industrialized multiple patented technologies geared toward enhancing the base corn-to-ethanol dry grind process, creating new and novel alternative co-products, and supplying the growing need for carbohydrate building blocks in the biochemical market. FQT developed and patented the Fluid Quip Technologies' MSC™ High Protein System.

Ryan Carter – General Manager & Principal Investigator for the MSCTM High Protein Project (2011-Present)

Ryan Carter has been the General Manager of Tharaldson Ethanol since 2011, maximizing plant efficiency and overseeing day-to-day operations, including Maintenance, Quality Control and Assurance, Grains, EH&S, Purchasing and Admin personnel, and enforcement of both plant and environmental policies. Mr. Carter has over 18+ years of experience in Processing Plant Operations. Prior to working with Tharaldson Ethanol, Mr. Carter was the Director of

Operations for Western New York Energy, LLC. During his career, he has also gained experience managing capital projects, training, financials, ethanol exports, and current industry economics. His role at GP Turnkey Tharaldson, LLC will be Principal investigator, working together with Corey Aanenson, Ryan Thorpe, Danum Hofland, and the Operations Manager to manage the MSC™ High protein Project, and analyze overall results of the project.

Corey Aanenson – EH&S Manager (2008-Present)

Corey Aanenson has over 20 years of management experience in the Ethanol Industry in Operations and Environmental, Health and Safety Management. After graduating with a degree in Law Enforcement, Corey started his ethanol career in 1998 as Chief in Operations with Agri Energy. Major duties were controlling the operations, safety, and environmental aspects of the facility. In 2001, Corey was the Plant Manager of Siouxland Ethanol and Livestock Cooperative, where he managed all aspects of facility operations, including all environmental, health, and safety compliance. In 2007, he continued his career as the Plant Manager at Heron Lake BioEnergy where he managed all aspects of facility operations, including all environmental, health, and safety compliance. Corey joined Tharaldson Ethanol management team in 2008 and reported to the plant's general manager, managed all the daily environmental, health, and safety compliance activity's along with assisting in operations of Tharaldson Ethanol. He was crucial in the startup of the plant's operations at the inception, as well as responsible for all environmental, health and safety requirements for the entire operation along with daily operations. On the MSC™ High Protein project, Corey will manage Environmental Health & Safety of the project and work closely with Ryan Carter, Ryan Thorpe, Danum Hofland, and the Operations Manager to oversee the entirety of the project and analyze overall results.

Ryan Thorpe – Chief Executive Officer (2008-Present)

Ryan Thorpe has 29+ years of financial experience, presently in the energy development industry. Through his career he has demonstrated planning expertise in a complex environment to drive creative business thinking, perform financial analyses, identify business efficiencies, and provide insightful strategic planning. Since 2008, he has led the structuring of organizing, planning, financing, operating, and permitting at Tharaldson Ethanol. He has worked with key players in the construction of a \$350 million-dollar ethanol plant, including purchasing agreements, contracts, permits, and various loan agreements. He oversees the complex project financial model analysis while managing a team to ensure accurate reporting and forecasting for evaluation and planning purposes. Mr. Thorpe was involved in the development stage of the organization to create the policies and company structures to lead to profitability and innovation in this rapidly growing business. On the MSC™ High Protein Project, Mr. Thorpe will work closely with Ryan Carter, Corey Aanenson, Danum Hofland, and the Operations Manager to oversee the entirety of the project and analyze overall results.

Danum Hofland – Plant Engineer (2008-Present)

Danum Hofland has over 20 years of electrical and mechanical experience in industrial facilities. After graduating from North Dakota State College of Science with two degrees in Associate of Applied Science in Electronic Technology and Associate of Applied Science in Electrical Technology, he worked for Minn-Dak Farmers Coop in Wahpeton, ND as an Instrumentation Tech installing and repairing mechanical and electrical equipment in the plant. In 2004, he continued his career at Northern Pipe Products as the lead electrician/ asst. maintenance supervisor where he supported the maintenance team and assisted engineering on increasing the throughput and efficiency of the equipment and installed new equipment to grow the company's production.

During his time at Tharaldson Ethanol, Mr. Hofland started as the E & I supervisor where he worked closely with the Maintenance Manager and guided electrical contractors and programmers that were installing and commissioning all plant equipment to make the start-up date for the new plant. Danum worked alongside of his technicians, troubleshooting instrumentation, calibrating transmitters, repairing motor starts, updating schematics, setting up control valves, programming variable frequency drives, and testing electrical equipment. In February of 2012, he was promoted to the maintenance/E&I manager and is responsible for a team of sixteen maintenance supervisors and maintenance technicians to schedule work throughout the plant. Danum was promoted to plant engineer in 2018 overseeing all maintenance throughout the plant. He initiates, creates expense budgets and manages projects to improve efficiency throughout the plant. He supervises general contractors and negotiates with vendors to get the best prices possible on projects and equipment needed for the plant. He

communicates with operations to coordinate repairs on equipment and implements policy and procedures to ensure plant cleanliness. Danum has meetings with management members that work together as a team to make the plant the most efficient and profitable as the company grows in the future.

Operations Manager to be Hired – Operations Manager

The operations manager will be hired in summer 2022. The Operations manager will work closely with Ryan Carter and Corey Aanenson to oversee the entirety of the MSC™ High Protein project. The Operations Manager will manage the employees for the MSC™ High Protein project to ensure that the production process is running as intended with the new technology and will be responsible for training employees on the proper function and maintenance of the MSC™ High Protein system. The Operations Manager will also oversee the maintenance of the system to ensure that the facility is running optimally.

Kipp Stevens – Laboratory Manager (2011-Present)

Kipp Stevens is the QA/QC Laboratory Manager for Tharaldson Ethanol. He oversees the quality assurance and quality control programs as well as day-to-day laboratory operations. Prior to joining Tharaldson Ethanol in 2011, Mr. Stevens served as the laboratory supervisor for the Department of Veterans Affairs. He was responsible for clinical laboratory operations and was active in developing policies and procedures to assure compliance with accrediting agencies and clinical laboratory regulatory requirements as a part of the laboratory quality management program. Mr. Stevens also spent 5 years with the Department of Veterans affairs in a Medical Technologist role where he worked in a variety laboratory disciplines which included chemistry, hematology, microbiology, and transfusion medicine. Mr. Stevens holds a master's degree in both business administration and management from the University of Mary School of Business, and a bachelor's degree in Microbiology as well as Clinical Laboratory Science from North Dakota State University. On the MSC™ High Protein project, Mr. Stevens will be documenting and analyzing data for the project and reporting information to the management team.

Fagen, Inc. – General Contractor

GP Turnkey Tharaldson has selected Fagen, Inc. as exclusive general contractor to construct and install Fluid Quip Technologies' MSC™ High Protein system for its biorefining platform. Fagen, Inc. is a premier, full-service EPC contractor, which has constructed 60% of the ethanol production capacity in the U.S. They are a premier engineering and construction firm in the biorefining space with an unrivaled history as a high quality, reliable construction partner capable of large scale, duplicative, and complex project management. Fagen Inc. is the exclusive third party for the engineering/consultant service costs.

Jacob Clements – Fagen, Inc. Project Manager (2014-Present)

Jacob Clements will be the Project Manager with Fagen, Inc. with the construction and installation of Fluid Quip Technologies' MSC™ High Protein system. Mr. Clements has 6 years of experience at Fagen, Inc. as a Project Manager, Project Engineer, and QC Inspector where his responsibilities have included scope management, schedule compliance, cost benefit analysis, risk analysis, problem resolution, client interface, and strict safety policy adherence and project demobilization, oversee site construction, maintains the project master schedule, monitors productivity and makes necessary adjustments, performs material take-offs, and deriving the most cost-effective plan. In addition to his experience at Fagen, Inc., Mr. Clements has 7 years of experience as a Pipe Welder/Fitter. Mr. Clements is an AWS Certified Welding Inspector.

Greg Canterbury – Construction Manager with Fluid Quip Technologies

Greg Canterbury has 45 years of experience in Power, Concrete, Chemical, Oil and Gas construction industries. Mr. Canterbury has 20 plus years in supervision upholding core values in safety, quality, and productivity. He emphasizes responsibility in the implementation and compliance of all construction and company policies, specs, and procedures. He has led diversified teams during construction to meet deadlines and budgets while maintaining strict conformance and is very knowledgeable in multiple crafts and all aspects to maintain the project from recruitment, manpower, construction, inspection to scheduling and completion. Mr. Canterbury will be working with Ryan Carter, Corey Aanenson, and Jacob Clements with managing the installation of the MSC™ High Protein project.



Tharaldson Ethanol Plant I, LLC

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Casselton, ND 58012
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Tharaldson | Ethanol

November 15, 2021

North Dakota Industrial Commission
State Capitol, 14th Floor
600 East Boulevard Ave Dept 405
Bismarck, ND 58505-0840

Subject: Tax Liability Statement for NDIC Renewable Energy Program Application

Dear Members of the Renewable Energy Council:

I verify that GP Turnkey Tharaldson, LLC does not have an outstanding tax liability owed to the State of North Dakota or any of its political subdivisions.

Sincerely,

Ryan Carter
General Manager
Tharaldson Ethanol Plant I, LLC
3549 153rd Ave SE
Casselton, ND 58012
701-347-3314
rcarter@tharaldsonethanol.com