



Tino J. Breithaupt
Senior Vice President of Economic Development
Traverse Bay EDC

May 29, 2009

Tania Howard
Biomass Energy Program Coordinator
Department of Labor & Economic Growth, Energy Office
611 W Ottawa
Lansing, MI 48913

RE: PLA-09-35 Progress Report

Dear Ms. Howard:

Please accept this letter as the final report regarding PLA-09-35. This project has been completed. The final report as submitted by Terry DeBlaay has been included with this report.

The project as proposed consisted of a study of the available biomass fuel available in a 50 mile radius from the proposed location for a 36 MW power plant to be located in Rapid River Township, Kalkaska County. The only deviation from the proposed plan was the change of location of the power plant from Rapid River Township to Mancelona Township. Jordan Exploration was unable to obtain the zoning amendments needed to allow for the construction of the plant. Jordan Exploration identified a second suitable site in Mancelona Township, three miles from the Rapid River Township. As a result, the name of the project was changed from Rapid River Renewable Energy to Mancelona Renewable Resources. There was no change of ownership.

The major accomplishment for this study was the identification of available fuel sources, the percentage of the total volume of woody biomass needed to sustain the proposed power plant per year. The results of this study will be used to demonstrate the viability of the power plant to prospective investors and financiers. This was a comprehensive study that is believe to be precise and effective and was accomplished in a timely and efficient manner. There were no new problems in carrying out this study. The completed study has been forwarded to the following organizations:

- Patrick Cudney, North Region Director, Michigan State University Extension
- Dana Gallagher, Michigan Farm Bureau
- Mike Dibernardo, Michigan Department of Agriculture
- George Berghorn, Michigan Forest Products Council
- Tom Barnes, Executive Director, Michigan Association of Timbermen
- Lori Phalen, Executive Director, Michigan Association of Conservation Districts

As much of the study was conducted by a third party sub-contractor, Terry DeBlaay, there was no coordinated effort with other organizations in conducting the research for this study.

The results of this study have positively impacted the proposed project to build a biomass based electrical generation facility. Based partly upon the findings, the development company is proposing to move forward and is in the process of purchasing the site to house the facility. The

next step will be to enter into a power purchase agreement with a utility, and seek appropriate equity and leveraged financing for the project. The development company also intends to proceed with obtaining plant specifications and an air quality permit.

This project was funded from several sources. In addition to the direct funding from the State of Michigan Energy Office, Jordan Exploration and the Traverse Bay EDC donated the time for Ben Brower, Gail Holland, Sarah Racine and Laura Galbraith as an in kind match.

An actual to proposed budget has been attached to this report. There are several areas that did not meet budget projections; contract services, travel, in-kind time and postage. The original budget was based on an estimate of 80 contract hours to complete the study. The actual time to complete the study was 116 hours. Jordan Exploration has contributed the funds required over and above the grant amount. The original budget also included a travel line item for Terry DeBlaay to travel around the region to make presentations to the above mentioned organizations. After the report was complete, it was determined that a presentation was not needed. As there were no presentations to be made, the time required from Ben Brower and Gail Holland was less than had been anticipated. The final report was also submitted to the above mentioned organizations via e-mail, eliminating the need for printing and postage. The time pledged from the Traverse Bay EDC has remained consistent.

Attachments

- Fuel Study – Final Report
- Final Budget showing original budgeted amounts to actual amounts

If you have any questions, please feel free to contact me directly

Sincerely,

A handwritten signature in cursive script, appearing to read "Troy Brewster".

WOOD FUEL AVAILABILITY STUDY
FOR
WOOD FIRED ELECTRICAL GENERATING PLANT
IN
MANCELONA MICHIGAN

Report to Rapid River Renewable Energy, LLC

By
Terry DeBlaay
Randy Kuipers

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This report was prepared on behalf of Rapid River Renewable Energy, LLC. Submitted on May 5, 2009 to fulfill the requirements of Grant Number PLA-09-35, funded by the U.S. Department of Energy State Energy Program (SEP) and managed by the Michigan Biomass Energy Program, DELEG Bureau of Energy Systems.

Table of Contents

	Page
Executive Summary	3
Background Information	4
Woodshed Region	4
Map of Core Supply Areas	5
Wood Resources within Woodshed	6
Analysis of Wood Supply	7
Forest Sources	7
Sawmill Sources	9
Competition for Wood Fiber	9
Map of Woodshed Areas for Competing Mills	12
Cost Analysis for Wood Fuel	13
Strategies for Successful Procurement Program	15
Appendices	17
List of Suppliers	18
Authors Vitae	19
Availability for Additional Consultation	21
Contact Information for Potential Suppliers	21

Executive Summary

The need for increased electrical generation from renewable sources in Michigan is growing. Part of that need is being addressed by the development of a wood fired electrical generating station at Mancelona. The sole fuel for the proposed plant is wood. Wood is a sustainable and renewable source of boiler fuel. This wood can come from two primary sources; forest/logging suppliers or sawmill residues (sawdust, bark, chipped slabs). Forest sources represent over 70% of the likely supply of wood.

Economic trucking distances and competition from other markets are the limiting factors on wood fuel supply. Most of the wood will need to come from within a 60 mile radius of Mancelona. This includes all or part of 13 counties in the Northwestern portion of Michigan's Lower Peninsula.

Competing markets within the woodshed of the proposed plant include other wood fired electrical generating plants and forest products manufacturing plants. Four of the six biomass electrical generating plants have woodsheds which overlap Mancelona's woodshed. Six forest products manufacturing plants purchase wood fiber within the woodshed of the proposed plant at Mancelona.

Whole tree chips from loggers are the core component of the wood supply. At today's prices this type of fuel will cost between \$25 and \$30 per green ton FOB Mancelona. The average cost per ton can potentially be reduced by utilizing re-processed logging residues, sawmill residues and alternative fuels.

A comprehensive procurement plan developed and overseen by experienced professionals is highly recommended. Specific input from potential suppliers reinforced the need for critical items in the fuel procurement plan to set the Mancelona plant apart from its competitors.

Background Information

Energy requirements in Michigan are anticipated to expand for the foreseeable future. The majority of electrical generation in Michigan is from non-renewable sources (e.g. coal, natural gas). There is a need to produce more electrical energy from renewable sources. Woody biomass is an important component of this portfolio. Unlike many other states, Michigan is uniquely situated to produce significant portions of its' renewable electrical capacity from woody biomass.

Rapid River Renewable Energy is planning to build a 36 megawatt wood fired electrical generating plant in Mancelona/Kalkaska region. In preparation for this venture, they wisely decided to conduct a wood fuel feasibility study to determine the economic availability of wood to fuel the proposed plant. The information included in this study will provide a factually based platform from which to launch a successful wood fuel procurement program.

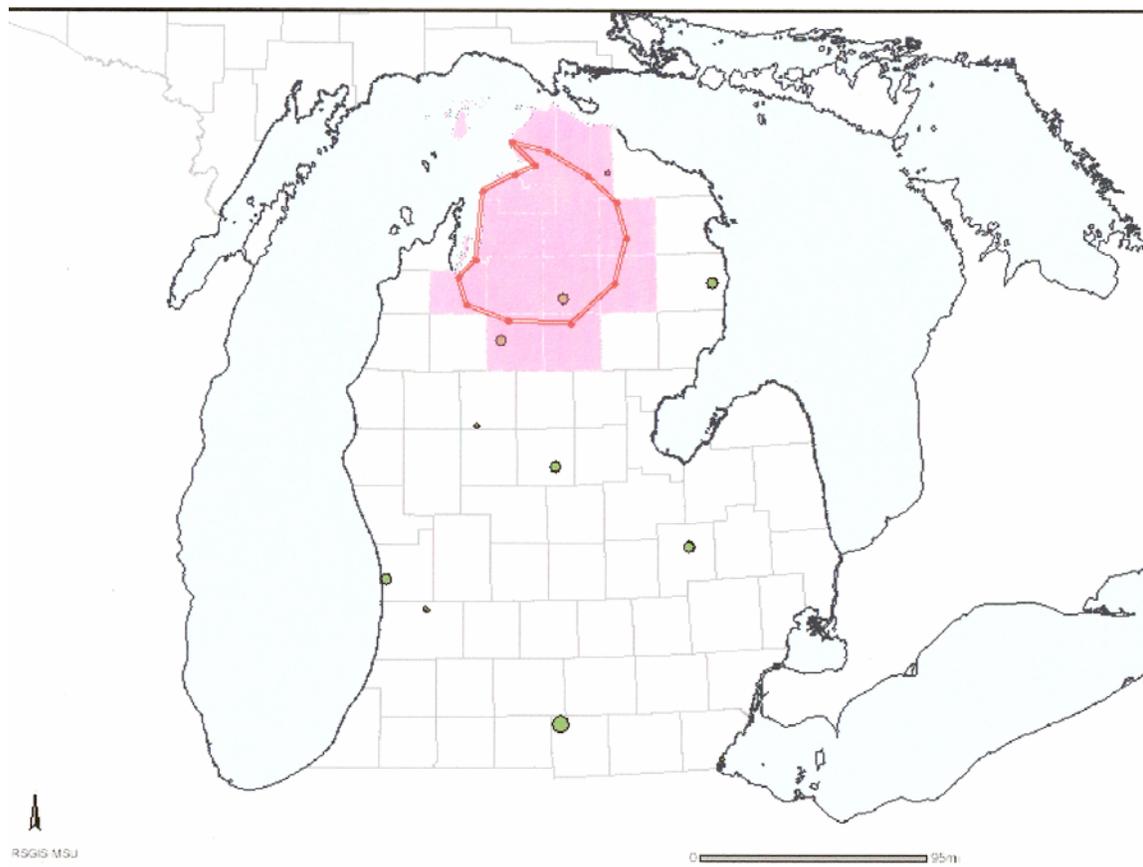
Michigan's forest products industry has a long history. Because of the abundant forests in northern Michigan, there have been many forest based manufacturing plants built throughout the state in the past 100 years. These include paper, corrugated medium, engineered wood products (e.g. OSB, particle board, MDF, hardboard, plywood), sawmills, and electrical generating plants.

Recent declines in Michigan's economy and an overall malaise in the global forest products industries has wrought some heretofore unseen changes in our forest based industries. The current condition of Michigan's forest products industries must be viewed from both the positive opportunities it presents as well as the negative impacts it may have. On the positive side, there is less competition for the available wood fiber.

Wood shed Region

The area from which wood fuel can realistically be expected to be drawn includes the 13 counties listed in the table on page 6 and outlined in color in Map 1 on page 5. The woodshed area is determined by the economic trucking distance from the proposed plant. The economic trucking distance includes the cost of diesel fuel, the proximity to competing markets, the price paid for wood at the plant, and the number of loads per day a truck can generate from a given work site. We will assume a maximum trucking distance of 60 miles. This distance can go up or down depending on the factors listed above.

The following map shows the geography of the area from which wood fuel can be procured. The circle on the map defines a 50 mile radius from Mancelona. The thirteen highlighted counties define the woodshed area for the proposed plant.



Wood Resources within the Woodshed

The following table details the acres of timberland and the timber volume by county within the thirteen county region describing the woodshed for this project. There are 3,182,000 total acres of timberland within this thirteen county area. The total volume of merchantable timber within the wood shed is 57,068,000 cords.

We assume a 3% per year growth rate on this forested acreage. This results in an annual addition of 1,712,040 cords of wood per year to the forest land within the described 13 county woodshed region. We assume 3.3 green tons per cord. Therefore the region is adding 5,649,732 green tons of total woody biomass per year.

The power plant will use approximately 400,000 green tons of wood fuel per year. This is 7.0% of the annual growth within the woodshed region. In financial terms this is synonymous with using 7.0% of the interest and none of the principal.

Counties within Wood Shed Region		
County	Forested Acres (x 1,000)	Timber Volume (Thousand Cords)
Emmet	206	4260
Cheboygan	349	6466
Charlevoix	164	4262
Antrim	164	3824
Otsego	171	4484
Montmorency	294	5245
Grand Traverse	174	3173
Kalkaska	261	4752
Crawford	296	3663
Oscoda	323	4431
Wexford	275	5483
Missaukee	235	3488
Roscommon	270	3537
Total	3182	57068

The information on this table is from the 2007 USDA FIA data; <http://199.128.173.26/fido/output>; and the Michigan Forest Analysis Resource Bulletin NC-179.

Analysis of Wood Supply

The total volume of wood that should be considered as potential supply for this project can be separated into two categories; forest sources and sawmills.

Forest sources consist of logging operations. For the purpose of determining supply volumes for a power plant, logging operations need to be limited to whole tree chipping suppliers. Round wood producers (those that produce wood as pulp wood or logs) cannot be considered as suppliers unless they are willing to invest in converting their operations to include whole tree chipping as part of their operational portfolio.

Sawmill sources include sawdust, bark and chipped slabs.

Forest Sources

There is a large gap between total volume of wood growing and that which is available. Wood availability is a complex and fluid issue to accurately assess. The following factors contribute to the availability of forest sources of wood.

Logging contractors are an obvious key. Without an adequate number of logging contractors, all the wood in the world will do no good. There has been a steady decline in the number of logging contractors in the past several years. Reasons for this decline include the loss of major markets for forest products. These losses include Menasha Corporation in Otsego, SAPPI in Muskegon, and Georgia Pacific in Gaylord. The wooden pallet business has also shrunk. The pallet business has been closely tied to automotive manufacturing and with the shrinking auto sector we have lost many pallet manufacturers. The overall downturn in the economy has caused many other forest products manufacturing companies to slow production or close their business altogether.

The result of the loss of markets for forest products is the parallel loss of logging contractors. We have personal knowledge of several logging contractors that have permanently relocated to southern states.

With the annual increase in woody biomass, fewer loggers, and the prospect of emerging markets this could be viewed as a very good time for astute business people to seize this opportunity. However, recent history has taught those in the logging business to become cynical. Long term commitments were made by major markets and then reneged on. Pricing promises were made and then changed. Many loggers invested a lot of capital to switch from round wood to chips (or visa versa) only to be told that the product they switched to was no longer going to be purchased.

Logging contractors have learned to not trust what they are told by the markets they supply to. During the 1970's and 1980's it was common for loggers to have loyal relationships backed up with long term contracts with the markets they supplied. During the 1990's corporate mergers and hostile takeovers changed operational strategies for major corporations. Forest products companies historically understood the long term nature of the forestry business. Things have changed so that short term economic decisions drive most business strategies. As a result the logging contractors that have survived have learned to trust their own instincts, resist the promises of mutually loyal business relationships, and supply wood products to the markets which are most profitable in the near term. They have also positioned themselves to have multiple markets. Very few, if any, logging contractors commit themselves to one market.

Another factor in the availability of forest sources of wood is the private landowner. Until recently, the real estate development value of land outweighed the forestry value. Forest land got broken up into smaller and smaller parcels with each parcel having a residence on it. This forest fragmentation has resulted in two things; first many parcels are too small to be commercially viable for a logging operation and second, many landowners have urban values and do not want to manage their forest land through timber harvesting. Therefore a certain percentage of forest land within the watershed of this project will not be available for logging purposes.

The price paid for standing timber is another factor in the availability of forest sources of wood fuel. Free market principles drive the cost of standing timber (stumpage) on private land. Some landowners will not harvest their timber unless the price exceeds their perceived value for the timber. This perceived stumpage value is usually too high to work in the price matrix for a wood fired power plant.

The price of stumpage on public land (county, state, federal) is partially determined by the free market and partially by the government agency pre-determining the value of the timber.

Lastly, soil and weather conditions, and other logging restrictions determine availability of forest sources of wood. Seasonally wet soils and adverse weather conditions restrict the amount of time available for timber harvesting activities. On public land logging restrictions include: snowmobile trails, ORV trails, loose bark season (spring), oak wilt, emerald ash borer, Indiana bat, red shouldered hawk, threatened and endangered species, riparian zone protection, retention areas, and a host of others. Loggers have to have contingency plans for myriad conditions.

Taking all of these factors into consideration and applying the 58 years of combined experience of the authors we apply a 60% availability factor to the timber volumes reported on page 6. We believe that of the 5,649,732 green tons of additional volume grown each year 3,389,839 tons would be available within some combination of the availability factors listed above. Annual power plant needs are still only 11.8% of this projected available annual growth.

We did not segregate this volume of timber growth by product class. Some of this growth is in hardwood logs, some in conifer logs, and some in pulpwood. It would require significant investment of time and resources to break out the portion of the annual timber growth that could be considered as having no higher value than boiler fuel. Since the plant needs represent only 11.8% of the annual growth, it can be safely assumed that all other markets combined would not absorb over 88.2% of the annual growth.

Sawmill Sources

Sawmills have three sources of waste wood. These include sawdust, bark, and slab wood. Not all sawmills have all three of these products. The sawmills we contacted within the wood shed region of Mancelona are all selling their mill waste to existing markets. To acquire some of this material the sawmills will need to be convinced that it is in their best interest to sell some of their mill waste to a new market.

This can be best achieved by working with sawmills close to Mancelona. This would reduce the trucking costs of transporting their wood waste. Another argument can be made to sawmills to sell some of their wood waste to a new location in order to diversify their markets. Of course the economics of such a decision would have to make sense to the sawmill owners. As a last resort, the procurement staff could try to persuade a mill to change markets by just paying them more; this is a last course strategy and is not recommended.

Competition for Wood Fiber

In spite of the apparent surplus of woody biomass, it needs to be remembered that there are a number of competing markets for the wood currently being produced from the forestlands within the woodshed region of the proposed electrical generating plant in Mancelona.

Competing markets can be segregated into two groups. One group includes the eleven buyers of wood fuel in the Lower Peninsula. Included in this group are the eight existing wood fired electrical generating plants: Cadillac, McBain, Grayling, Hillman, Lincoln, Filer City, Flint, and Mount Pleasant; and six

manufacturing plants that purchase wood fiber: PCA in Manistee, SAPPI in Muskegon, DPI in Alpena, LP in Newberry, New Page in Muskegon, and Versa in Quinnesec.

Four of these plants are too far from Mancelona to be considered competitors for wood fuel; these would be the wood fired power plants in Lincoln, Mount Pleasant, Muskegon, and Flint. The five power plants within Mancelona's woodshed (Cadillac, McBain, Grayling, Filer City, and Hillman) have a combined annual wood usage of approximately 1,000,000 green tons per year.

DPI in Alpena buys about 70,000 tons of wood fuel per year. They are currently paying \$24 per ton. Filer City is buying about 80,000 tons per year of fuel wood to burn with their coal. They are paying \$22-\$24 per ton depending on distance from the mill. The wood fired electrical generating plants are currently paying \$17-\$26 per ton delivered to the plant. Variations in prices depend on distance from the plant, product being purchased, inventory levels at the plant, and delivery volumes (bonuses for larger volumes).

There are six major forest products manufacturing facilities that buy wood within the woodshed region of the proposed plant in Mancelona. These include: PCA in Filer City, Weyerhaeuser in Grayling, DPI in Alpena, New Page in Escanaba, Potlatch in Gwinn, Versa in Quinnesec, and LP in Newberry. These plants are potential competitors for the wood fiber required to fuel a new power plant.

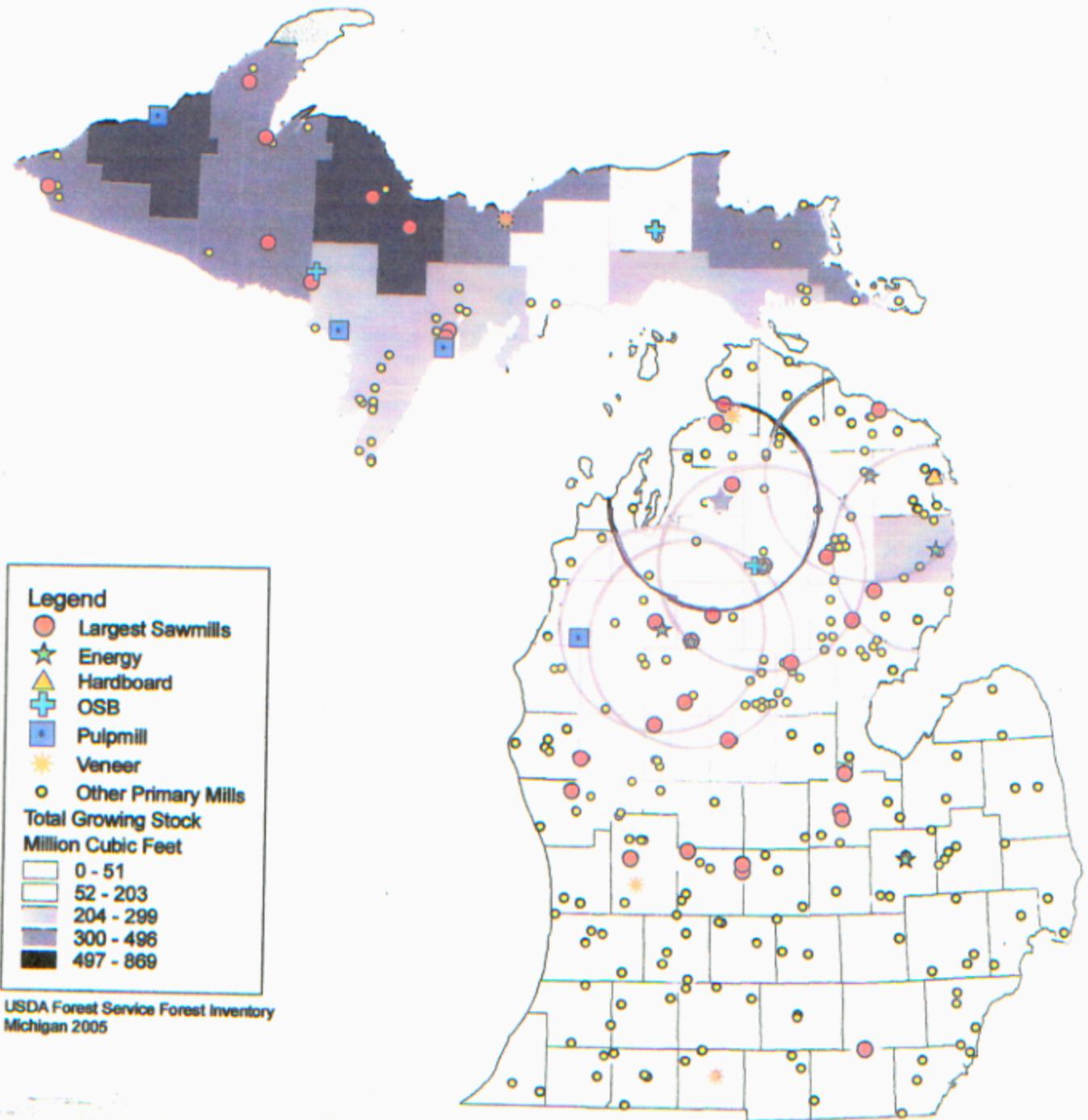
Other manufacturing facilities that utilize forest products and should be considered potential competitors include the following. Green house operations in Ontario are currently purchasing wood chips in Michigan to fuel boilers for seasonal heat needs. Wood carpet markets buy chips to use for playgrounds; they use only clean sawmill chips. Landscape markets are seasonal in Michigan (spring and summer), but typically pay more than boiler fuel prices and often divert logging residues away from power plants. There are wood pellet plants in Weidman (Maeder Brothers) and White Pigeon. The plant in White Pigeon is probably too far away to be much of a concern to the Mancelona location.

There are a number of sawmills within the woodshed that purchase wood. Sawmills use the large trunk portion of the tree, not the smaller pulpwood portion of the tree. As such, they are a net asset to a power plant by bringing wood to market that might not otherwise find its way into the supply system. Therefore we treat sawmills as assets to a wood fired electrical generating plant.

Several new wood using manufacturing plants have been announced. None of them are yet under construction, but they need to be considered as possible future competitors for wood fiber. They are listed below with estimated wood usage rates.

- Wood pellet plant in Gaylord – 90,000 tons/year
- Wood pellet plant in White Cloud – 100,000 tons/year (2009 start up?)
- Consumers Energy biomass plant in SW MI area – 300,000 tons/year
- Coal Fired power plant – Rogers City – 200,000 to 300,000 tons/year
- Wood Ethanol plant – Kinross – 1,000,000 tons/year
- Wood Ethanol plant – Muskegon – 250,000 tons/year
- Others?

Map 2. Wood shed areas of competing mills.



Lighter colored circles = 50 mile radius of existing biomass plants
Darker circle = 50 mile radius of Mancelona

Cost Analysis of Wood Fuel

The cost per ton for wood fuel will be determined by market forces. In the case of a new wood fired electrical generating plant these forces are already in place as a result of a well established market for fuel wood.

In the past there was a noticeable difference in prices paid between the five biomass plants in northern Michigan. Grayling was usually the lowest because their transportation costs were the lowest. Cadillac had wide swings because of fluctuating inventory levels, and a failure to develop secure supplier relationships. McBain, Hillman, and Lincoln remained consistently in the middle of the pack. Prices averaged between \$15 and \$18 per ton for a number of years.

In the past 18-24 months prices have steadily increased to their current level. This increase was due to rising diesel fuel costs, a decrease in the number of chipping contractors, increasing stumpage rates, and a settling out of supply streams between individual plants. As a result, the current price for forest sources of chips is about \$24 per green ton. And most plants are running short on inventory going into the spring break up for 2009. It is likely that the price will escalate to \$26-\$30 per green ton in order to build needed inventories.

Logging residues that are processed with a horizontal grinder can typically be purchased for less than whole tree chips. These products can usually be purchased for \$5-\$7 per ton less than whole tree chips. At today's prices ground logging residues can be purchased for about \$17-\$19 per ton.

Logging residues come from stockpiled tops from tree length operations or bark/branches from flail de-barking at chipping operations. Both of these sources need to be re-ground in the woods with a portable grinder (usually a horizontal grinder/hammer mill). The fuel quality from this type of wood is low (dirt, fractured ends). Most power plants have material handling systems that limit the volume of this type of wood. It also has a higher ash content than chips (a down stream cost), and causes boiler slagging from higher dirt content. It can, however, be the lowest priced source of wood fuel. It will cost about \$2 - \$3 per ton for the material and \$12 per ton for processing costs. Trucking costs vary depending on distance to the mill.

Power plant designers should consider innovative material handling systems that allow for unimpeded use of ground logging residues. Increased volumes of this type of material could give the plant at Mancelona a competitive advantage.

Alternative fuels should be considered as companion fuels for wood. The two most common are TDF (tire derived fuel) and paper pellets. Both have been used in existing power plants. Sorted trash from landfill tipping floors should be avoided. There are too many problem issues with trash (air quality permit issues, ash disposal issues, fuel contamination issues, etc.). TDF has the best potential because it is available, will flow through material handling systems with wood, stabilizes boiler temperatures, and can reduce overall fuel costs. Pelletized paper creates problems with wind borne contamination in the wood yard, and increased ash output. MDEQ air permits can be amended to allow for alternative fuels. These amendments can be costly and time consuming, but are usually worth the effort. BAT (Best Available Technology) is normally required to amend existing air permits. The authors have extensive experience with acquisition and use of alternative fuels. This opportunity is discussed in the section on the availability for additional consultation on page 19.

The projected start up date for the proposed Rapid River Renewable Energy plant in Mancelona is about three years. The prices quoted in this report could change significantly by 2012.

Strategies for a Successful Procurement Program

Long term (3-5 year) supply contracts should be negotiated and signed as soon as possible. This will assure the plant of a known volume of wood, put a sense of security into the market place and allow suppliers the time needed to secure financing, purchase equipment and line up stumpage. Make sure there is enough financial strength in the company to stick with the agreements. Annual cost of living increases built into the long term contracts could be a key to securing supplier loyalty. The worst thing that could be done would be to back out on a price and volume agreement in the first few years of operation. It takes a long time to establish a good reputation, and only a short while to create a bad one. There is a certain amount of skepticism regarding biomass energy plants among the logging community. It will require a well thought out procurement plan to overcome this cynicism. Requesting input from the supplier base would create some "buy in" and commitment from the eventual pool of suppliers. Several logging contractors we spoke with commented on their desire to have long term contracts.

Many suppliers we spoke with have logging equipment that is not being used. There was general agreement among most of these suppliers to bring equipment out of moth balls if the right market opportunities exist. Several logging contractors we spoke with have sold off equipment as the forest products sector declined in recent years. However, most of them said they would be interested in purchasing chipping equipment if a secure market developed. Financial offers to help suppliers purchase needed logging equipment would be welcomed by most suppliers, and would secure supplier loyalty for the long term.

Whole tree chips should represent at least 60-70% of the wood fuel. They are the most secure source. As shown in the wood resources section of this report, there is an abundant supply of standing timber. Chip volumes can be increased upon request, sawmill residues are fixed. Chips flow best through handling systems at power plants (belts, bins, chutes). They are clean sources of fuel (free from dirt and contaminants) and result in lower ash output in the boiler. The only down side to whole tree chips is that they will likely be the highest cost wood fuel at a biomass energy plant.

Try to acquire as much sawmill residue as possible close to the plant. Consider subcontracting the trucking, sawmills are in the business of making lumber. The easier you can make residue disposal for a sawmill the higher your chances of redirecting some of this wood to your power plant. This type of fuel represents a good opportunity to lower overall wood fuel costs.

Wood yard construction can have a large influence on supply. Suppliers want to get in and out quickly. The truck dump should go directly on the ground, not into a hopper. The scaling procedures should be simple. Design it so the drivers can scale in their own loads and operate the dump themselves. 24/7 dump hours are a big plus. Service is a key factor.

RRRE may want to consider helping selected suppliers in financing portions of their harvesting systems. This would assure additional infrastructure in the woods, and secure some long term supplier loyalty for the procurement program.

Several potential suppliers we contacted expressed an interest in having a wood fuel procurement staff to work with. Most of the biomass power plants purchase "gate wood". This means that wood is purchased from whoever shows up at the gate. With this scenario the secretarial person inputs daily delivery tickets to generate payment, and someone else (often the plant manager) oversees the supply contracts and tries to manage the wood inventory level. This method of wood fuel procurement is not very efficient. Examination of the recent performance of wood fuel programs at existing power plants demonstrates wildly fluctuating inventory levels, pricing instability, and high levels of dissatisfaction with the suppliers.

Having a procurement manager to draft, implement and maintain a comprehensive procurement plan would set Mancelona apart from the other wood fuel markets. This distinction could provide another competitive advantage. A procurement manager needs to be a high level professional person with extensive experience. It may seem as though this is an unnecessary labor cost. However, the right person can easily justify their expense by creating a seamless fuel procurement plan. This plan would maintain consistent inventory levels, provide predictable pricing structures, and create long term supplier stability.

APPENDICIES

List of Potential Suppliers

Authors Vitae

Availability for Additional Consultation

Contact Information for Potential Suppliers

POTENTIAL SUPPLIERS					
SUPPLIER	COUNTY	TYPE *	GREEN TONS **	DELIVERED PRICE ***	MILES TO PLANT ****
Woodlands Harvesting	Alpena	WTC	25000	28	60
Fahl FP	Antrim	SMC	16000	21	5
Moeke Lumber	Antrim	SMC	5000	20	4
Silver Leaf Mill	Antrim	SMC	16000	22	15
Fritz FP	Benzie	WTC	10000	26	50
Baumgarten FP	Cheboygan	SMC	5000	24	68
Jaroche Bros	Cheboygan	SMC	8000	24	45
Chris Muma FP	Gladwin	WTC	30000	30	80
Shawn Muma Logging	Gladwin	WTC	30000	30	80
Lake Ann Hdwdws	Grand Traverse	SMC	3000	21	50
Yates FP	Iosco	WTC	20000	28	90
Blake FP	Kalkaska	WTC	40000	26	20
Rothig FP	Lake	WTC	50000	30	80
John Doyle & Sons	Mecosta	WTC	30000	28	85
Robert Gentz FP	Manistee	WTC	30000	30	90
Bisballe FP	Missaukee	WTC	40000	28	50
Lutke FP	Missaukee	WTC	20000	28	50
Mid-Michigan Logging	Missaukee	WTC	30000	25	50
Roger Bazuin & Sons	Missaukee	WTC	40000	30	50
Willie Outman FP	Missaukee	WTC	25000	26	50
Biewer sawmill	Missaukee	SMC	10000	30	50
Carroll's FP	Montmorency	WTC	25000	26	40
T R Timber Co	Ogemaw	WTC	30000	30	70
Stuckman FP	Otsego	WTC	30000	25	25
Al Lamberson	Otsego	WTC	20000	28	26
Elenz Inc	Otsego	WTC	25000	28	25
Timberline Logging	Otsego	WTC	35000	28	25
E H Tulgestka & Sons	Presque Isle	WTC	5000	28	75
Precision Forestry	Presque Isle	WTC	20000	28	70
Housler Sawmill	Wexford	SMC	4000	28	40
Total Tons			677000		

* WTC = Whole Tree Chip; SMC = Sawmill Chip

** These are volumes to Mancelona; actual volumes may be higher or lower.

***This is dollars per ton delivered to Mancelona in 2009 dollars

**** Miles from suppliers home base, miles from harvest location could be less.

Authors Vitae

Terry DeBlaay

Academic

Michigan Technological University, Master of Science in Wildlife Ecology, 1980

Michigan Technological University, Bachelor of Science in Forestry, 1978

Grand Rapids Junior College, Associates of Science, General Studies, 1976

Work Experience

Timberline Logging, Gaylord, MI, 2008 – Present

Forester: responsible for stumpage acquisition for whole tree chipping crew, scheduling job locations and moves for two chipping crews, timber cruising, property boundary location, harvest boundary location, timber sale contract implementation.

Fahl Forest Products, Mancelona, MI, 2004 – 2008

Forester: responsible for stumpage procurement of 1,000,000 board feet of hardwood grade logs per year, supervision of all aspects of the timber harvest (timber sale contracts, MDEQ permits, county surface water permits, county road permits, performance bonds on roads, property boundary location, identifying and marking trees for harvest), pricing of timber purchases to meet annual pricing goals.

Northern Timberlands, Inc., Alpena, MI, 2000 – 2004

General Manager: responsible for all operational decisions for a \$10 million annual budget, met contractual supply obligations with Georgia Pacific in Gaylord (150,000 tons/yr), Louisiana Pacific in Gwinn (50,000 cords/yr), Biewer Lumber in McBain (25,000 cords/yr), Beaver Log Homes in Kalkaska (25% of their annual usage), many smaller mills; supervised staff of three field foresters, one yard manager, one office manager; ensured stumpage procurement to meet all market obligations.

Hillman Power Company, Hillman, MI, 1994 – 2000

Procurement Supervisor: responsible for all procurement activities related to supplying wood fuel to a 20 megawatt wood fired electrical generating plant; tasks included securing and managing supply contracts with whole tree chippers, sawmills, wood residue grinders; purchase of tire derived fuel (TDF); inventory control.

Dow Corning Corp., Midland, MI, 1980 – 1994

Biologist/Forester for seven years, Department supervisor for seven years: supervise logging contractors, property and harvest boundary location, timber cruising, timber sale contract administration, timber pricing negotiations, supervise field staff and office staff, negotiate annual wood supply contracts, manage wood inventory levels for a 18 megawatt wood fired co-generation station.

Randy Kuipers

Academic

Michigan State University, Bachelors of Science in Forestry, 1977

Work Experience

Randy Kuipers Consulting Forester, LLC, Holland, MI 2007 – present.

Owner of forestry consulting business. Work with private forest landowners implementing forest and wildlife management. Work with four whole tree chip producers that supply energy chips, pellet chips and paper chips to various markets in SW Michigan. Work with private landowners and public owners of timberlands administering log sales, red pine saw timber sales and timber stand improvement projects. Assisted in the writing of two wood procurement plans for private industry.

Georgia Pacific, Gaylord, MI 2006

Wood Procurement Manager for six months until mill closed. Responsible for procurement of virgin fiber from southern wood shed (300,000 tons/yr.). Worked with whole tree chip producers and private landowners to supply the raw material needs of the Gaylord plant.

Menasha Corporation, Otsego, MI, 1984 – 2005

Woodlands Manager in charge of procuring 220,000 green tons of virgin wood fiber per year. Supervised senior forester and was key member of Menasha's leadership team. Monitored other chip markets that might threaten Menasha's fiber supply. Developed forest management plans for private forest landowners. Maintained 1 ½ - 2 year stumpage inventory at levels to run the Otsego Mill. Maintained excellent relationships with 20 sawmill and whole tree chip suppliers. Negotiated chip pricing and long term fiber supply contracts.

Availability for Additional Consultation

Developing a project of this magnitude is a daunting task. Gathering the best available information at the outset can allow for a smooth start up. This report contains comprehensive information on the wood fuel availability portion of this project. However, there are many other aspects to developing a biomass energy production facility. The authors have extensive experience in several of these fields. We are open to discussions pertaining to developing other elements of this project. Listed below are some possible areas for consideration.

- Developing a wood fuel procurement plan
- Implementing a wood fuel procurement plan
- Investigating alternative fuel sources (TDF, paper, etc)
- Consulting with plant designers on wood yard layout and design

Contact Information for Potential Suppliers

Information gathered from the suppliers listed in the “Potential Suppliers” list in the appendix includes some of the following: name, address, phone number, e-mail address, logging equipment owned, current markets for forest products, volumes currently delivered, pricing structures for current markets, interest in a new market at Mancelona, potential volumes to a new market, additional equipment needed for a new market, pricing requirements for a new market, and desired operational structure for a new market. Because of the large volume of data gathered from the potential suppliers, it is not listed in this report. The results of this raw data have been synthesized and are contained in the body of the report. This contact information is available upon request from the authors.

