Susan Ludwig
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April 25, 2016

VIA ELECTRONIC FILING
Daniel P. Wolf
Executive Secretary
Minnesota Public Utilities Commission
121 7th Place East, Suite 350
St. Paul, MN 55101-2147

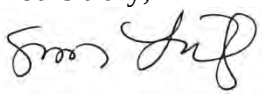
Re: Minnesota Power's Camp Ripley Solar Project Petition
Docket No. E015/M-15-773

Dear Mr. Wolf:

Minnesota Power hereby electronically submits its Compliance Filing to meet the requirements of Order Points 2 and 7 of the Minnesota Public Utilities Commission's February 24, 2016 Order in the above-referenced Docket.

Please contact me at the number above if you have any questions about this filing.

Yours truly,



Susan Ludwig

SL:sr
Encl

STATE OF MINNESOTA
BEFORE THE
MINNESOTA PUBLIC UTILITIES COMMISSION

****

In the Matter of the Petition of Minnesota Power for Approval of Investments and Expenditures in the Camp Ripley Solar Project for Recovery through Minnesota Power's Renewable Resources Rider under Minn. Stat. § 216B.1645 and Related Tariff Modifications	Docket No. E015/M-15-773 **COMPLIANCE FILING**

****

I. INTRODUCTION

On August 21, 2015, Minnesota Power ("the Company") filed a Petition with the Minnesota Public Utilities Commission ("Commission") seeking approval of investments and expenditures in the Camp Ripley Solar Project ("Ripley Project") and for cost recovery pursuant to Minn. Stat. § 216B.1645. The Company also requested Commission approval for changes necessary to appropriately allocate costs to customers as set out in the Minnesota Solar Energy Standard ("SES") in Minn. Stat. § 216B.1691, subd. 2f. The Commission issued an Order in this Docket on February 24, 2016, approving certain aspects of Minnesota Power's Petition, including the Company's proposal to add a new Rider for Solar Energy Adjustment ("SEA Rider") and a Solar Renewable Factor as part of the Company's Renewable Resources Rider. The Order included additional compliance requirements for Minnesota Power, namely a requirement to obtain an independent appraisal of the Company's land lease with Camp Ripley and a requirement for the Company to propose an alternative calculation of the Company's SEA Rider. Minnesota Power submits this Compliance Filing to meet the requirements of Order Points 2 and 7 of the February 24 Order. The Company also requests approval to adjust its existing Rider for Fuel and Purchased Energy Adjustment ("FPE Rider") and approval of its proposed SEA Rider.

II. VALUATION OF LAND LEASE

Throughout this Docket, the Department of Commerce – Division of Energy Resources ("Department") expressed concern that the lease payments Minnesota Power proposes to pay Camp Ripley for the use of the land to build the Ripley Project may be too high and that the lease

payments include a premium to the value of comparable land. This concern led the Commission to require Minnesota Power to obtain an independent appraisal of the valuation of the land lease in Order Point 2:

> 2. Approved Camp Ripley Project investments and expenditures are subject to further adjustment by the Commission.
>
> a. Minnesota Power shall obtain an independent property appraisal for the leased land as evidence of the value appropriate for recovery from ratepayers of the proposed land lease agreement. The appraisal shall be done to the standards the Department of Natural Resources uses for valuing easements and property purchases.
>
> b. Within 60 days of the date of this order, Minnesota Power shall file the independent appraisal with the Commission and the Commission will determine if the total approved recovery amount for the project should be adjusted for a different land lease payment.

As described in its October 23, 2015, Reply Comments, Minnesota Power and Camp Ripley approached the land lease by determining a fair value for the agreement based on the approximate market value of the cost of leasing a similar parcel of land in the area, plus additional costs that Minnesota Power would incur if a similar solar array was built elsewhere. These additional costs include an estimation of the fair value of property taxes, security, and permitting benefits. Camp Ripley is a protected military installation with round-the-clock security. Additionally, it is a state entity located on land owned by the State of Minnesota and is the ultimate permitting authority for most of the environmental approvals needed for the project to proceed. Consequently, the site offers additional benefits beyond the value of the land which have been reflected in the land lease. In addition to a value for land, property taxes, security and permitting benefits, Minnesota Power also included a payment of $25,000 in the land lease to partially fund a solar education center at Camp Ripley.

Minnesota Power obtained an independent property appraisal for the utilization of a similar parcel of land, done to the standards of the Department of Natural Resources. This appraisal, conducted by Ramsland and Vigen, Inc., includes a valuation of the land and property taxes for the 35-year term of the agreement with Camp Ripley and is included as Attachment 1 to this filing.

Additionally, Minnesota Power obtained an independent evaluation of the benefits of permitting and security that the Camp Ripley project will realize due to its location. This

evaluation, conducted by Burns & McDonnell, is included as Attachment 2, and identifies an additional benefit of the site location. Since the solar array is located within Camp Ripley, any initial fire response would be provided by National Guard personnel and would likely occur in less time than a typical response from the local fire department due to the close proximity of the Camp Ripley fire response personnel. With a quicker response time, damage to equipment could be reduced, and as a result, insurance premiums for the Ripley Project would likely be lower. Insurance premium reductions were not quantified in the evaluation and would be in addition to the savings estimates provided in the evaluation.

Minnesota Power's land lease with Camp Ripley includes total payments of $1.6 million over 35 years, or a net present value of $592,723. The results from the independent appraisals and a comparison to the actual lease are summarized in Table 1 below. The total payments from the independent appraisals are about $1.0 million and the net present value is $403,243.

Table 1. Net Present Value of Appraisal Results

	Lease Value	Appraisal Value
Land value	$200,000	$128,000
Property tax benefits	118,627	44,819
Security benefits	224,096	180,624
Permitting benefits	25,000	24,800
Solar Education Center	25,000	25,000
Total Value (NPV)	**$592,723**	**$403,243**

Minnesota Power signed the land lease with Camp Ripley on November 19, 2015, and the Company is bound by the terms of the lease as set out in the Initial Filing. The total payments using the appraisal values are $667,080 lower than the land lease payments the Company will pay to Camp Ripley over 35 years. Minnesota Power believes the lease payments are appropriate and justified given the benefits of siting a facility within Camp Ripley property. If the Commission determines that the total approved recovery amount for the project should be adjusted for the appraised value, the recoverable portion of operation and maintenance ("O&M") expense would be reduced by $19,059 per year.

III. ALTERNATIVE SEA CALCULATION

The February 24 Order in this Docket includes approval for the Company to add a new SEA Rider and a Solar Renewable Factor as part of the Company's Renewable Resources Rider. The Department recommended that Minnesota Power should submit an alternative calculation of the SEA which should rely on an on-peak energy offset or another methodology that would better reflect the actual avoided energy costs due to solar additions. Additionally, the Office of Attorney General – Residential Utilities and Antitrust Division and Fresh Energy recommended that the Company should include a credit in the SEA that accounts for additional benefits of solar energy, such as by using the Department's Value of Solar Methodology ("VOS") previously accepted by the Commission as required and limited by Minn. Stat. § 216B.164, subd. 10(e).[1] Consequently, the Commission's Order included the following compliance requirement in Point 7:

> **7.** Within 60 days of the date of this order, Minnesota Power shall submit a proposed alternative calculation of the SEA Rider. The proposal shall include, at a minimum:
>
> a. an on-peak energy offset or another method that would better reflect the actual avoided energy costs due to solar additions, and
>
> b. an analysis of the applicability of the VOS Methodology components.

Minnesota Power has developed a proposed SEA calculation with an on-peak energy offset and has conducted an analysis of the applicability of the VOS components, as discussed later in this section.

The SEA Rider, along with the Solar Renewable Factor, is needed in order for Minnesota Power to appropriately bill customers exempt from paying costs to meet the SES. Minn. Stat. § 216B.1691, subd. 2f(d) states that customers exempt from the SES "may not have included in the rates charged to them by the public utility any costs of satisfying the solar standard specified by this subdivision." The issue at hand is whether there are benefits associated with solar energy production needed to meet the SES which exempt customers enjoy and should pay for. Were it not for the need to exempt certain customers from paying costs needed to meet the SES, the SEA

[1] Docket No. E999/M-14-65.

Rider would not be needed, since all customers would pay for and receive the benefits of the solar production.

Minnesota Power approached developing a new methodology with the principle that solar benefits that would be paid by all customers, including exempt customers, would need to utilize known and measurable data and would need to represent the value from a least-cost perspective of duplicating those benefits from another resource.

A. Proposed SEA Rider Calculation

Minnesota Power has acknowledged that it is appropriate to account for time-of-day generation and usage considerations when crediting solar-paying customers to better reflect the actual avoided energy costs due to the addition of the solar project. The Company has revised its proposed SEA Rider calculation as described below.

1. Steps to Calculate SEA Rider

A sample calculation of the proposed alternative Solar Energy Adjustment ("SEA") in the SEA Rider is provided in Attachment 3. The steps are similar to those initially proposed and included in the August 21, 2015, Initial Filing. As previously proposed, the methodology calculates the Fuel and Purchased Energy Adjustment ("FPE Adjustment"), now altered to account for time of solar generation benefits, and creates a new SEA Rider. The FPE Adjustment is to be applied to all customer energy usage (as it currently does) and the SEA is to be applied only to the energy usage of solar-paying customers. The steps to calculate the proposed alternative SEA and FPE Adjustment are described below.

1) Solar energy costs related to purchases will be removed from the fuel costs in the FPE Adjustment.

2) The kWh of solar energy generation and purchases will be removed from the total kWh sales of electricity in the FPE Adjustment.

3) The FPE Adjustment without solar is calculated by dividing the non-solar energy costs in (1) by the kWh of non-solar energy generation in (2).

4) A new Time of Generation Adjustment ("TOGA") factor will be calculated, which accounts for the time of solar generation. This calculation, described fully in the next section, represents the "premium" value of solar energy's time of generation. The sample calculation in Attachment 3 assumes a TOGA factor of 0.12.

5) The TOGA is calculated by multiplying:
   a. The TOGA factor in (4), by
   b. solar generation MWhs, and by
   c. the FPE Adjustment without solar in (3)

6) The TOGA-adjusted FPE Adjustment is calculated by adding the TOGA in (5) to the non-solar energy costs in (1) and dividing this result by the non-solar generation in (2). This resulting TOGA-adjusted FPE Adjustment will be applied to all customers' kWh monthly usage. Note that this usage includes both solar and non-solar energy.

As in the previous proposal, Minnesota Power will then calculate the SEA, which is the means to allocate purchased solar costs and all solar production to solar-paying customers. The SEA will be either a credit or charge[2] on a per kWh basis, and will include an adjustment for the purchased solar energy already paid with the FPE Adjustment in step (6) above. The SEA will be calculated as follows:

7) Start with the cost of solar energy purchased. (If there are no solar PPA costs, this value will be zero.)

8) Add a credit for costs already allocated through the TOGA-adjusted FPE Adjustment in step (6) above. This is the total TOGA-adjusted FPE Adjustment applied to solar energy generation, calculated in dollars, plus the TOGA calculated in (5).

9) The amount of (7) plus (8) will be divided by the total kWh energy usage of solar-paying customers, resulting in the SEA. This SEA will be a credit or charge for solar-paying customers on a per kWh basis and will be applied to all energy usage of solar-paying customers.

[2] This adjustment would be a charge if solar energy costs are higher than non-solar energy costs. However, if solar energy costs are lower, or if there are no purchased energy costs associated with the solar energy (as in the Ripley Project), there would be a credit to solar-paying customers.

As previously proposed, the FPE Adjustment (now adjusted for the TOGA) will be applied to the total customer load subject to the FPE Adjustment, without the kWh associated with solar purchases or generation, on a per kWh basis. The SEA, which now accounts for the time of generation, will be applied only to solar-paying customers and will be applied to their total load. Since Company-owned generation to meet the SES will have zero fuel costs, revenue requirements for this generation will be recovered by the Solar Renewable Factor. Consequently, costs in the SEA are expected to include only purchased solar energy.

2. Steps to Calculate TOGA

The TOGA is the means the Company proposes to quantify the value of the time of generation for solar energy in order to appropriately compensate solar-paying customers for the time the solar energy is produced, rather than applying a 24-hour average cost, which is the current method for calculating the FPE Adjustment. The TOGA is to be added to the base FPE cost (as described in step 6 above) and the resulting TOGA-adjusted FPE Adjustment applied to all customer energy usage.

Attachment 4 includes a sample calculation of the proposed TOGA using data from May 2015, including solar generation data from a solar facility operating in Minnesota Power's system. The Company proposes to use the hourly avoided cost projections calculated as set out in Minn. Stat. § 216B.164, subd. 3(b)[3] on a monthly billing basis, overlaid with the hourly solar generation on a monthly billing basis, to determine a weighted average solar generation value and compare this to the 24-hour simple average currently used to calculate the FPE Adjustment. It is important to note that the hourly avoided cost projections utilized in the calculation are only used to determine hourly variances of costs to calculate the TOGA factor. The actual "value" of the TOGA, expected to be a premium, is calculated by applying the TOGA factor to the solar generation described in step 5 above.

The sample calculation included in Attachment 4 results in a TOGA of 0.12. This calculation is based on May 2015 data. The Company expects the TOGA factor to increase

[3] The avoided cost data is used in the Company's Annual Distributed Generation Rate Compliance Filing in Docket No. E015/M-04-2030. It is also filed annually in March with the Federal Energy Regulatory Commission in Minnesota Power's "Annual Formula Rate Update and True-Up" filing.

during summer months and decrease during winter months, since the timing of solar production more closely approximates peak load in the summer and does not as closely approximate the winter peak load which occurs in the evenings. So the TOGA factor in July will likely be higher than 0.12 and the factor in December will be lower.

The steps below outline the Company's proposed calculation of the TOGA factor.

1) Calculate a simple average of hourly avoided energy cost ($/MWh) for the billing month, using the data which is the basis for the avoided cost calculation as set out in Minn. Stat. § 216B.164, subd. 3(b). Consistent with the FPE Rider calculation, the Company proposes to use data for two of the previous three months.[4]

2) Calculate total hourly solar generation in kWhs. As in step one, this would include data for two of the previous three months.

3) Calculate the weighted average solar generation cost by multiplying the hourly avoided cost value from (1) by the hourly solar generation from (2), dividing by 1,000 to account for the conversion to MWh, and summing the total for the month. The result is a dollar value.

4) Calculate the weighted average solar generation cost in $/MWh to account for the marginal time of generation, by taking the dollar value from (3) and dividing by the total kWh solar generation from (2) and converting the value to MWh. The result is a $/MWh that reflects the time of generation of the solar energy.

5) Calculate the TOGA factor by dividing the $/MWh result from (4) by the simple average $/MWh calculated in (1) and subtracting one.

This approach has merit because it reflects the hourly variability of solar production alongside the hourly avoided Minnesota Power system cost, which is an appropriate basis to value the avoided fuel cost of solar generation for customers exempt from the SES.

[4] Because of the lag between the time when data is available to calculate the TOGA factor and the monthly billing cycle, the Company proposes to use an average calculation of two of the previous three months, as is used in calculating the FPE Adjustment. Note that the sample calculation in Attachment 4 uses one month of data for simplicity.

Additionally, the data is known and measurable and is expected to be fairly straightforward to administer on a monthly basis.

Minnesota Power requests approval of the edits to its existing FPE Rider as shown in Attachment 5, pages 1 through 6. The Company also requests approval of its proposed SEA Rider as shown in Attachment 6, pages 7 and 8. These riders have been updated to reflect the methodologies described in this section.

B. Applicability of VOS Components

Minnesota Power has analyzed the applicability of the VOS components in compliance with Order Point 7b of the Commission's February 24 Order. In Reply Comments filed October 23, 2015, in this Docket, the Company described its concerns with applying the VOS methodology, as approved by the Commission in Docket No. E999/M-14-65, into the SEA calculation. The Company has not filed a VOS tariff, nor is it required to. Additionally, under Minn. Stat & 216B.164, subd. 10(b), the VOS is intended to be used as an alternative tariff to net metered and small cogeneration facilities less than 1MW in size. However, the Company agrees there is merit in evaluating the individual components of the VOS for inclusion in the SEA Rider.

As previously stated, the Company believes that, although it is appropriate to account for time-of-day generation and usage considerations when crediting solar-paying customers, only known and measurable benefits associated with the solar generation should be included in the SEA in order to abide by the solar exemption statute. Minn. Stat. § 216B.1691, subd. 2f(d) is clear and the Company is concerned that adding additional "values" to solar generation beyond what is known and measurable and of value to exempt customers, could result in a legal challenge to the proposal in violation of the exemption statute. This in turn could adversely impact other solar projects the Company has developed and is contemplating, including the Community Solar Garden proposal in Docket E015/M-15-825. Consequently, the Company's analysis of the VOS components includes only known and measurable values in its SEA Rider calculation.

Solar is becoming more economical as a generation resource and eventually could be selected as a low-cost power source as part of the Integrated Resource Plan process. Once the

Company has reached the solar generation required under the SES, additional solar that is added as a low-cost resource will be paid for and enjoyed by all customers, as the solar exemption statute only applies to costs of solar generation required to meet the SES. Since Minnesota Power needs approximately 30 MW of solar energy to meet the SES, there is a ceiling to the amount of cost shifting expected between solar-paying and solar-exempt customers. Given that there is a limit to the benefits of solar needed to meet the SES, it is reasonable to weigh the scale of the value of cost shifting between customers with the administrative burden of determining methods and allocating costs for components which may have perceived conceptual values that are expected to be marginal.

The Company's evaluation of VOS components determined that several of the components – avoided fuel cost, avoided fixed and variable O&M, avoided generation capacity cost, and avoided environmental cost – would have no near-term value for Minnesota Power customers using the defined VOS methodology, since most components of the methodology are based on avoiding cost from a combined cycle or combustion turbine ("CT") existing in the Company's system today. Minnesota Power does not expect to add a gas generation resource to its system until 2023, so these VOS components would not provide a positive value until after this implementation.

The Company's evaluation also determined that quantifying and including many of the components in the FPE Rider, as the SEA is designed to do, could be problematic in that the FPE Rider is established to primarily be a mechanism to account for fuel and purchased energy. Minn. Stat. § 216B.16, subd. 7 (the "Energy Cost Adjustment Statute"), which provides the legal framework for the FPE Rider, allows an automatic adjustment of charges related to changes in wholesale energy rates, direct costs for natural gas, costs for fuel used in generation of electricity or the manufacture of gas, and prudent costs for emission controls. Most of the VOS components do not currently qualify for recovery under guidelines governing the FPE Rider and, consequently, would not be allowed to flow through the SEA.

With these limitations in mind, an evaluation of the applicability of each of the VOS components is included below.

1. Avoided Fuel Cost

Since energy generated from solar projects displaces fuel required to produce energy for the grid, this VOS component can be estimated and the Company agrees it should be included in the SEA Rider calculation. Minnesota Power proposes to use the SEA Rider and TOGA calculations described above to value the avoided fuel cost. Minnesota Power's proposal includes time of solar generation to value the avoided fuel cost of adding solar energy to the grid, and captures the estimated value of avoided fuel cost for solar-paying customers. The Company expects avoided fuel cost to be the most significant of all the VOS components in terms of value.

2. Avoided Plant Operation and Maintenance – Fixed

Minnesota Power generally agrees that the avoided fixed O&M costs could represent a benefit solar generation brings to all customers. Traditionally, the Company views the value of on-going avoided fixed O&M cost as a component of the market value of capacity. Consequently, this component is best "valued" as part of the avoided generation capacity cost, described later in this section. As previously mentioned, the Company does not expect there to be an actual value of avoided fixed O&M until 2023 at the earliest, using the VOS methodology. Further, avoided fixed O&M does not qualify to be included in the FPE Rider under the Energy Cost Adjustment Statute. Consequently, Minnesota Power does not believe it is applicable to include this VOS component in its current SEA.

3. Avoided Plant Operation and Maintenance – Variable

Minnesota Power generally agrees that the avoided variable O&M costs could represent a benefit of solar generation. However, this component is currently embedded in the Company's base rates and various riders and there is no known and measurable valuation of the benefit outside of a rate case. Because the value of avoided variable O&M due to solar is expected to be very small, given the Company's projection of solar additions required to meet the SES, and because this component does not qualify to be included in the FPE Rider under the Energy Cost Adjustment Statute, the Company does not believe it is applicable to include this VOS component in its current SEA.

4. Avoided Generation Capacity Cost

Minnesota Power agrees that solar energy brings capacity benefits. The Camp Ripley Project is expected to provide 5 MW of accredited capacity based on MISO's current rules for calculating the accredited capacity value of solar per BPM 11 – Resource Adequacy.[5] In Comments filed October 14, 2015, the Department stated that an appropriate methodology for allocating capacity cost between solar-paying and solar-exempt customers should be determined in Minnesota Power's next rate case. The Company agrees with this approach.

5. Avoided Reserve Capacity Cost

Because the Ripley Project will be accredited as a capacity resource in MISO's Resource Adequacy Requirements, there will be no avoided reserve capacity cost savings associated with the project. Per MISO's BPM 11 – Resource Adequacy, a capacity resource that is classified as a Load Modifying Resource and as Behind the Meter Generation, such as the Camp Ripley Project, will have no change to the Company's planning reserve margin requirements. Minnesota Power recognizes that a solar facility that reduces load directly (i.e. rooftop solar) and is not accredited in MISO as a capacity resource could produce a reserve capacity cost savings. However, this does not apply to the Camp Ripley project given it is not reducing customer load directly; it is a traditional generation resource that is accredited in MISO as a capacity resource. Additionally, the avoided reserve capacity cost would not be expected to apply to other future utility scale solar facilities.

6. Avoided Transmission Capacity Cost

An avoided transmission capacity cost would occur if solar generation were to reduce the peak customer demand for generation. Minnesota Power's peak is in the winter in the evening. Therefore, the Peak Load Reduction factor from a solar resource is expected to be at or near zero during the winter using the VOS calculation methodology. Further, avoided fixed transmission capacity cost does not qualify to be included in the FPE Rider under the Energy Cost Adjustment

[5] BPM 11 Resource Adequacy is the Resource Adequacy Business Practice Manual document which describes MISO's and other entities' roles and responsibilities related to maintaining Resource Adequacy, which is ensuring that Load Serving Entities (LSE) serving Load in the MISO Region have sufficient Planning Resources to meet their anticipated peak demand requirements plus an appropriate reserve margin.

Statute. Consequently, the Company concluded there should be no avoided transmission capacity cost included in the SEA Rider.

7. Avoided Distribution Capacity Cost

As with avoided transmission capacity cost, avoided distribution capacity cost would only occur if solar generation were to reduce the peak customer demand for generation. And again, since Minnesota Power is a winter peaking utility and the Peak Load Reduction factor per the calculation methodology is expected to be near or at zero during the winter, and since avoided distribution capacity cost does not qualify to be included in the FPE Rider under the Energy Cost Adjustment Statute, the Company concluded there should be no avoided distribution capacity cost included in the SEA Rider.

8. Avoided Environmental Cost

Minnesota Power agrees that solar energy could provide an avoided environmental cost once current and future environmental initiatives are rolled out and become known and measurable. For example, if a carbon regulation penalty were added in the future, solar energy would provide the benefit of avoiding the cost to emit carbon. The Company proposes considering a method to value avoided environmental costs once a carbon regulation penalty or other environmental initiative has been instituted and is known and measurable.

The Company believes its proposed SEA Rider is a fair method for allocating value associated with solar generation between solar-paying and solar-exempt customers. Although some stakeholders have argued that additional components of the VOS should be included in the SEA Rider, it is important to balance the solar exemption statute with the theoretical values solar energy brings to the grid. It is contrary to think that the policy enacted by the State to exempt certain customers from paying the costs to meet the SES, would result in these customers ultimately pay higher costs for energy than solar-paying customers. The Company's SEA Rider includes the largest VOS component – avoided fuel cost – in its calculation, while excluding other VOS components.

IV. CONCLUSION

Minnesota Power submits this Compliance Filing to meet the requirements of Order Points 2 and 7 of the February 24 Order and requests approval to adjust its existing FPE Rider and approval of its proposed SEA Rider. Minnesota Power appreciates the opportunity to provide additional information and looks forward to implementing the Camp Ripley Project and establishing a method to properly allocate solar costs to customers.

Dated: April 25, 2016

Yours Truly,

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April 20, 2016

Mr. Kristopher Spenningsby
Supervisor, Retail Accounts
Minnesota Power
30 West Superior Street
Duluth, Minnesota 55802

Re: Solar Array Site
Motor Pool Road
Camp Ripley, Minnesota

Dear Mr. Spenningsby:

Following your request for an appraisal of the above captioned property, I have inspected the property, reviewed available market data, and the findings are summarized herein.

This is an Appraisal Report which is intended to comply with the reporting requirements set forth under Standards Rule 2-2(a) of the Uniform Standards of Professional Appraisal Practice for a Summary Appraisal Report. The depth of discussion contained in this report is specific to the needs of the client and the intended use stated herein. As such, it presents only summary discussions of the data, reasoning, and analyses that were used in the appraisal process to develop the appraiser's opinion of value. Supporting documentation concerning the data, reasoning, and analyses is retained in the appraiser's files. The appraiser is not responsible for unauthorized use of the report.

The appraisal report, conclusions and value estimate are based on several Hypothetical Conditions or Extraordinary Assumptions discussed within the document.* Based on the analysis, findings and conclusions presented herein, it is my opinion that the market value of the subject property, or the most probable price estimated in terms of money which the subject would bring if exposed for sale in the open market, allowing a reasonable time to find a prudent purchaser who buys with a knowledge of all the uses to which it is adapted, and for which it is capable of being used, as of March 4, 2016.

ONE HUNDRED TWENTY-EIGHT THOUSAND DOLLARS
($128,000.00)

*Such caveats are commonly used in federal and state appraisal assignments when the appraisal assignment conditions vary from the actual land involved.

Respectfully submitted,

Gary A. Battuello, MAI
Certified General Real Estate Appraiser
Minnesota License #4000939

Solar Array Site

Camp Ripley

IDENTITY OF THE PROPERTY

The subject property of this report is ±60.8 acres of vacant land on the east side of Motor Pool Road at Camp Ripley Military Reservation, Morrison County, Minnesota,

This location in central Minnesota is ±7 miles north of the community of Little Falls and ±20 miles south of the Brainer-Baxter area.

Lands are level grasslands, partially covered with second-growth evergreen forest. Configuration of the site is shown on various exhibits, but is essentially rectangular with a north-south orientation.

A legal description is lengthy and is contained on the attached survey document.

A partial legal description is:

Part of Sections 4 and 9
Township 130 North-Range 29 West
Morrison County, Minnesota

PURPOSE OF THE APPRAISAL

The purpose of this appraisal is to estimate the market value of the herein described subject property. Market value is defined for federally related transactions and reproduced by the Appraisal Standards Board of The Appraisal Foundation on page 180 in its publication of the Uniform Standards of Professional Appraisal Practice, 2016 Edition (USPAP 16) as:

> MARKET VALUE: market value is the major focus of most real property appraisal assignments. Both economic and legal definitions of market value have been developed and refined. A current economic definition agreed upon by agencies that regulate federal financial institutions in the United States of America is:
>
> The most probable price which a property should bring in a competitive and open market under all conditions requisite to a fair sale, the buyer and seller each acting prudently and knowledgeably, and assuming the price is not affected by undue stimulus. Implicit in this definition is the consummation of a sale as of a specified date and the passing of title from seller to buyer under conditions whereby:
>
> 1. buyer and seller are typically motivated;
> 2. both parties are well informed or well advised, and acting in what they consider their best interests;
> 3. a reasonable time is allowed for exposure in the open market;
> 4. payment is made in terms of cash in United States dollars or in terms of financial arrangements comparable thereto; and
> 5. the price represents the normal consideration for the property sold unaffected by special or creative financing or sales concessions granted by anyone associated with the sale.

HYPOTHETICAL CONDITION

Market value estimates utilize a market value definition, such as the one on page 3, as a benchmark of understanding the valuation assignment. These definitions assume a normal buyer/seller relationship and the value estimate is that which would be obtained at a sale of the property.

The Camp Ripley property is within a military reservation and cannot technically be sold in the marketplace. However, for purposes of a market value estimate, a sale and associated sale price must be hypothesized or assumed. Since this is contrary to what is known to be true (i.e.; the property cannot be conveyed), it is necessary for credible appraisal results to use a Hypothetical Condition that the property could be sold or conveyed.

The Uniform Standards of Professional Appraisal Practice, 2016-2017, contains the following definition on page U-3.

> *Hypothetical Condition: a condition, directly related to a specific assignment, which is contrary to what is known by the appraiser to exist on the effective date of the assignment results, but is used for the purpose of analysis.*
>
> Comment: *Hypothetical conditions are contrary to known facts about physical, legal, or economic characteristics of the subject property; or about conditions external to the property, such as market conditions or trends; or about the integrity of data used in an analysis.*

Please note that the use of a Hypothetical Condition may impact assignment results.

INTENDED USE/USER OF THE APPRAISAL

This report and land value estimate are intended to assist in establishing costs of a use agreement for the subject site as a Solar Array location within the Camp Ripley Military Reservation.

It is intended to be used by the client, Minnesota Power; by administrators of Camp Ripley; and by regulators such as the Minnesota Public Utilities Commission.

PROPERTY RIGHTS APPRAISED

The subject of this report is the fee simple interest in the herein described real estate as of the date of inspection of March 4, 2016.

A fee simple interest represents the entire bundle of rights to use the land, including the right to hold, to use or to sell the property.

Technically, this again fits into the category of a Hypothetical Condition because the subject site is within the Camp Ripley Military Reservation and cannot actually be sold. From a valuation viewpoint a fee simple standard will be used to produce credible appraisal results.

SCOPE OF THE ASSIGNMENT

The appraisal process involved an inspection of the site on March 4, 2016. The site was viewed from a vehicle while driving the perimeter of the property. Photos were taken from various corners of the site.

A driving tour was also made of the nearby portions of the cantonment (developed) area of Camp Ripley.

Camp administrators were interviewed to verify land use, access, utility and security factors. County offices were contacted to confirm ownership, property assessment, tax and zoning information.

Land sales information was researched, gathered and analyzed from surrounding townships in Morrison County and in very southwest Crow Wing County abutting Camp Ripley. Land sales were mapped out and aerial photography/topographical maps and other aids were employed to estimate the character of the land sales.

Land sale information was used to develop a land value estimate for the subject site. Value was estimated as though the site was outside the military reservation and available for sale and use in a traditional fashion. Sales comparison is generally considered to be the most reliable indicator of value when sufficient comparable data is available. This is especially true when applied to vacant land.

HISTORY OF THE PROPERTY

The subject site has been held by the present owner, Camp Ripley, for many years. Camp Ripley staff indicate the site was at one time used as a landfill area, but it had been filled years ago, leveled and large portions of the site were planted with evergreens.

There is no known agreement to sell the property nor any current offering/listing of the site. An agreement for use of the site to build and operate a solar array has been negotiated between Minnesota Power and Camp Ripley (Minnesota National Guard). Full details of this agreement are not known, but the agreement is reported in public record to be for 35 years at a total cost of $1.6 million. This equates to an average of $45,714 per year. This payment would include the land plus fire protection, security and other amenities of being within the military reservation including use without payment of real estate taxes.

CURRENT USE

The lands are currently vacant and grass or tree covered. Two former baseball diamonds are located on the western edge of the site.

EXPOSURE TIME

Exposure time is the hypothetical period that the property would have been exposed to the market prior to the date of valuation. For the subject market area, this is estimated to be 6 to 24 months.

LARGER PARCEL

The subject property is 60.8 acres of vacant land within the 53,000 acre Camp Ripley Military Reservation. The purpose of this assignment is to estimate market value of the 60.8 acres of land to assist in setting a reasonable price for use of the land pursuant to a 35-year agreement between the landowner and Minnesota Power for the operation of a solar array.

Because of the proposed use of the land and the use of the appraisal report, the larger parcel will not be considered in this assignment, only the 60.8 acres identified as the solar array site.

AREA DESCRIPTION

Camp Ripley is a Minnesota National Guard Military Reservation in central Minnesota. It is also known as Camp Ripley Training Center (CRTC). Camp Ripley Military Reservation is a dominant feature in northern Morrison County. It occupies ±53,000 acres bordered on the east and north by the Mississippi River and represents the largest section of undeveloped shoreline on the river in Minnesota.

The CRTC serves as training grounds for Army National Guard units. It also has an on-going mission for training purposes of the Minnesota State Highway Patrol. Other public and private entities have access to various facilities at Camp Ripley for training and conference purposes.

State Highway 371 and U.S. Highway 10 are the major access roadways for the area. Surrounding lands are agricultural, forestry and recreational in character with scattered rural homesteads particularly along roadways and the Mississippi River corridor.

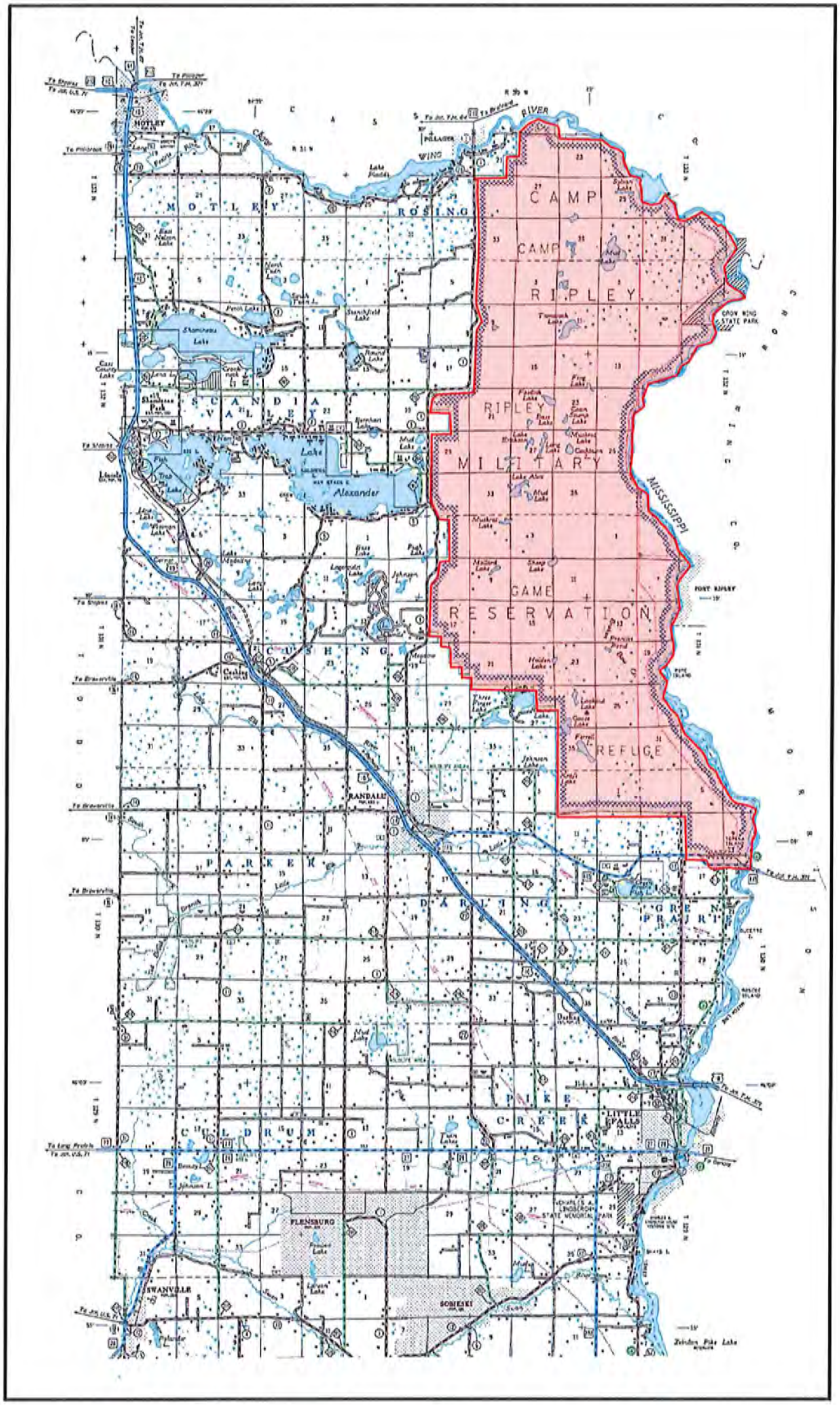
Nearby sizable communities are Little Falls to the south and Brainerd to the northeast. Little Falls is the Morrison County seat and Brainerd is the Crow Wing County seat.

Population data (U.S. Census) for the county and nearby cities are:

	2010	2000
Morrison County	33,198	31,712
Little Falls	8,343	7,719
Brainerd	13,590	13,178

National Atlas of the United States

Area Map

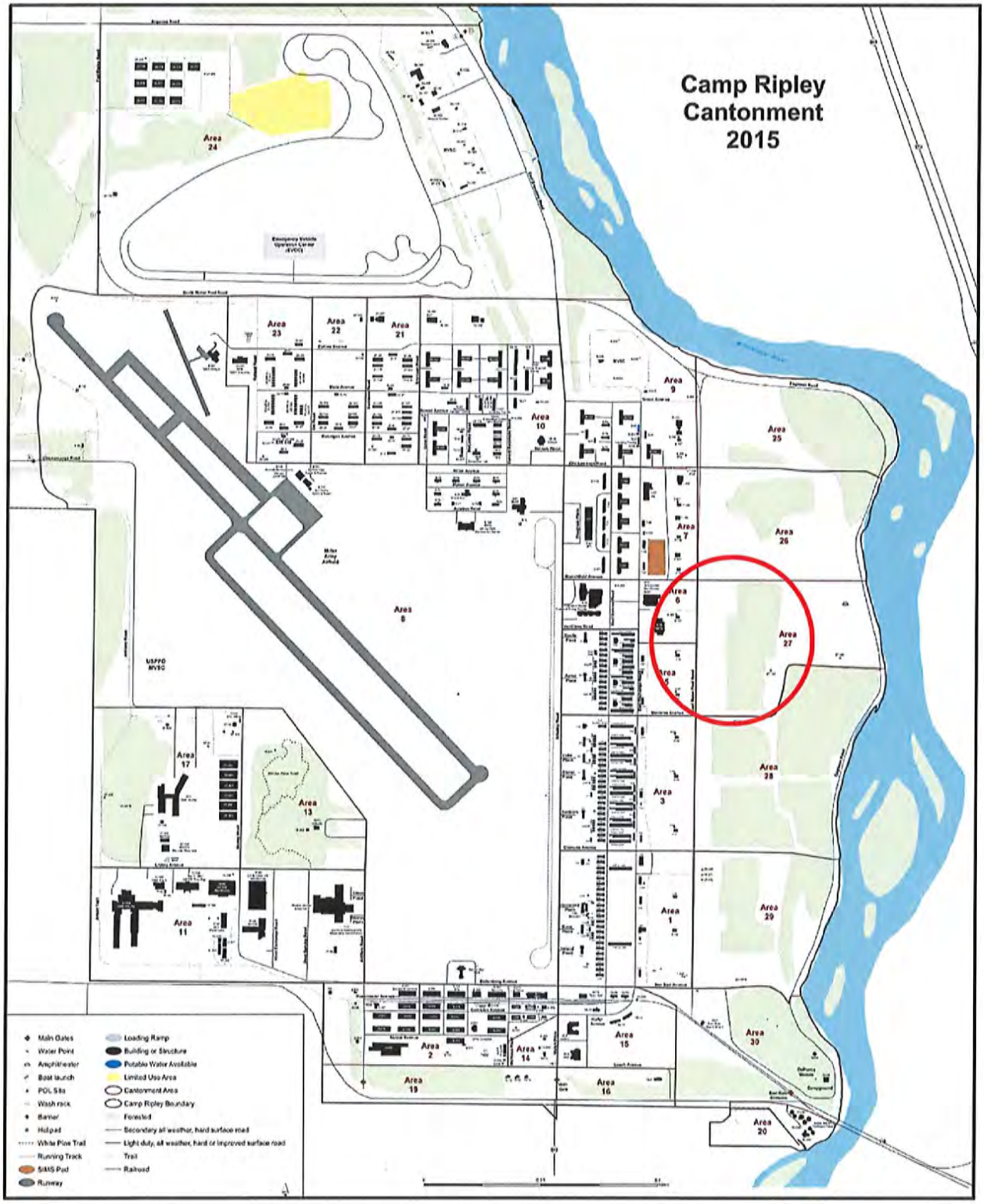

CAMP
CAMP
RIPLEY
RIPLEY
MILITARY
GAME
RESERVATION
REFUGE
MISSISSIPPI
RIVER
WING
Alexander
MOTLEY
ROSING
SCANDIA
VALLEY
CUSHING
PARKER
DARLING
GREEN PRAIRIE
PIKE CREEK
RANDALL
FLENSBURG
SOBIESKI
SWANVILLE
LITTLE FALLS
CROW WING STATE PARK
FORT RIPLEY

NEIGHBORHOOD DATA

The solar array lands are situated in the identified cantonment area of Camp Ripley. This is the populated and developed portion of the military reservation situated at the very southeastern section of Camp Ripley. This area is bordered on the east by the Mississippi River and on the south by State Highway 115, which is the access road to the gates of Camp Ripley. A rail spur also accesses the very southern tier of the Cantonment area.

This portion of Camp Ripley is developed with Miller Army Airfield, administration offices, maintenance and storage structures, permanent and temporary housing and recreational facilities.

Morrison County records identify the cantonment area of Camp Ripley as one parcel containing 2,640 acres. Lands here are essentially level, and undeveloped areas are typically grass or tree covered. Please view the following map of the Cantonment area to see site configuration, roads, and location of improvements.

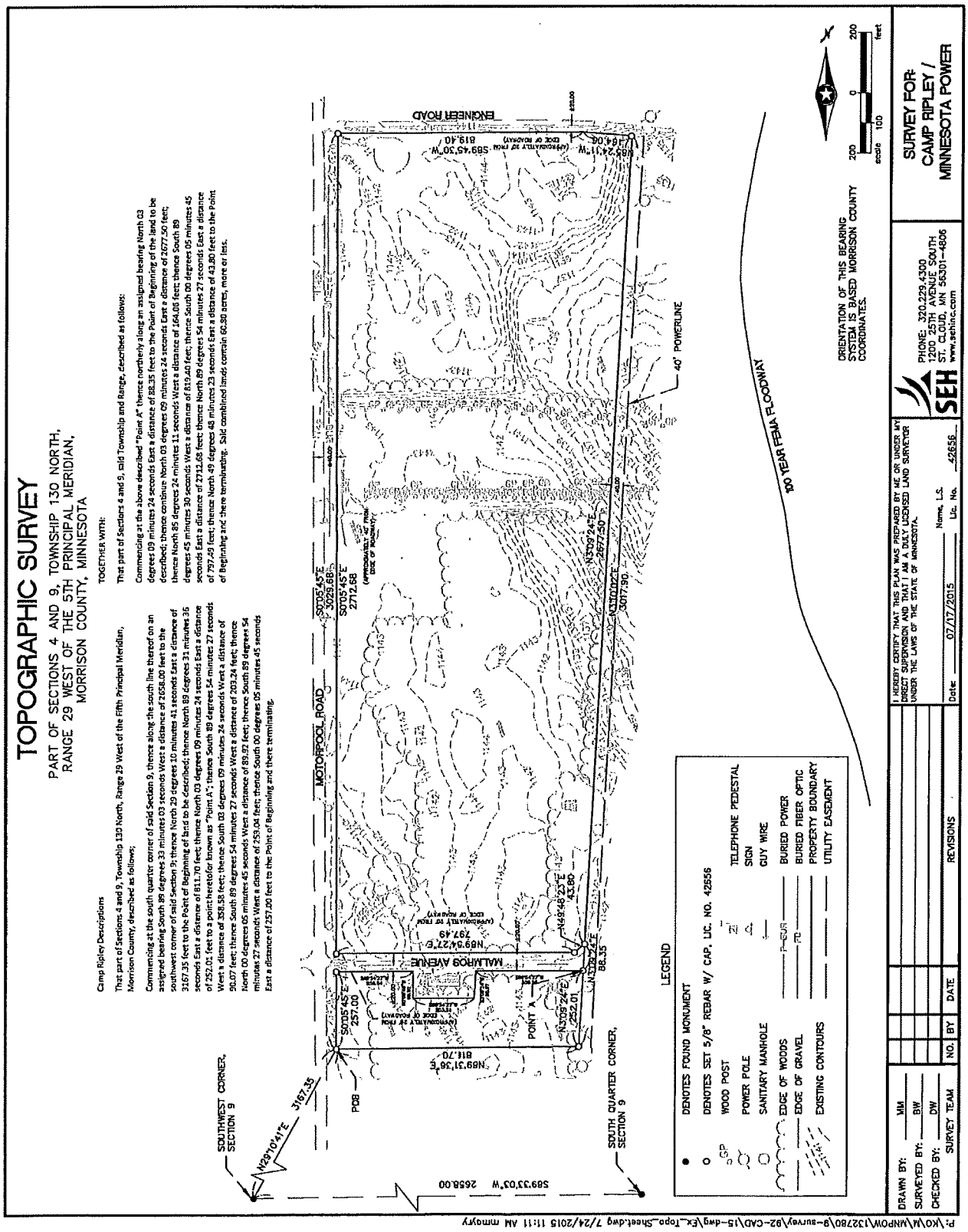

Camp Ripley
Cantonment
2015
Area 24
Area 23
Area 22
Area 21
Area 10
Area 9
Area 25
Area 7
Area 26
Area 6
Area 27
Area 8
Area 5
Area 28
Area 17
Area 13
Area 3
Area 11
Area 1
Area 29
Area 2
Area 14
Area 15
Area 30
Area 19
Area 16
Area 20
Main Gates
Water Point
Amphitheater
Boat launch
POL Site
Wash rack
Barrier
Helipad
White Pine Trail
Running Track
SRAS Pad
Runway
Loading Ramp
Building or Structure
Potable Water Available
Limited Use Area
Cantonment Area
Camp Ripley Boundary
Forested
Secondary all weather, hard surface road
Light duty, all weather, hard or improved surface road
Trail
Railroad

SITE DATA

The lands which are the subject of this report contain a surveyed 60.8 acres. Lands are level and grass or tree covered. The site is close to rectangular, on a north-south basis, and the northern line is wider than the southern line.

The site is bounded on the west by Motor Pool Road, on the north by Engineer Road and on the east by a powerline. Malmros Avenue runs through the southern portion of the site splitting off the southerly 4+ acres surrounding an electrical substation from the primary site intended for use as a solar array installation. Roadways are gravel.

A survey of the site with accompanying legal description is shown on the following page. As stated much of the site is level with limited elevation changes. The easterly portion of the north section of the site does have some areas sloping downward to the east towards the Mississippi River and its river corridor.


TOPOGRAPHIC SURVEY
PART OF SECTIONS 4 AND 9, TOWNSHIP 130 NORTH, RANGE 29 WEST OF THE 5TH PRINCIPAL MERIDIAN, MORRISON COUNTY, MINNESOTA
Camp Ripley Descriptions
That part of Sections 4 and 9, Township 130 North, Range 29 West of the Fifth Principal Meridian, Morrison County, described as follows;
Commencing at the south quarter corner of said Section 9; thence along the south line thereof on an assigned bearing South 89 degrees 33 minutes 03 seconds West a distance of 2658.00 feet to the southwest corner of said Section 9; thence North 29 degrees 10 minutes 41 seconds East a distance of 3167.35 feet to the Point of Beginning of land to be described; thence North 89 degrees 31 minutes 36 seconds East a distance of 811.70 feet; thence North 03 degrees 09 minutes 24 seconds East a distance of 252.01 feet to a point hereinafter known as "Point A"; thence South 89 degrees 54 minutes 27 seconds West a distance of 358.58 feet; thence South 03 degrees 09 minutes 24 seconds West a distance of 89.92 feet; thence South 89 degrees 54 minutes 27 seconds West a distance of 253.04 feet; thence South 00 degrees 05 minutes 45 seconds East a distance of 257.00 feet to the Point of Beginning and there terminating.
TOGETHER WITH:
That part of Sections 4 and 9, said Township and Range, described as follows:
Commencing at the above described "Point A" thence northerly along an assigned bearing North 03 degrees 09 minutes 24 seconds East a distance of 88.35 feet to the Point of Beginning of the land to be described; thence continue North 03 degrees 09 minutes 24 seconds East a distance of 2677.50 feet; thence North 85 degrees 24 minutes 11 seconds West a distance of 164.06 feet; thence South 89 degrees 45 minutes 30 seconds West a distance of 819.40 feet; thence South 00 degrees 05 minutes 45 seconds East a distance of 2712.68 feet; thence North 89 degrees 54 minutes 27 seconds East a distance of 797.49 feet; thence North 49 degrees 48 minutes 23 seconds East a distance of 43.80 feet to the Point of Beginning and there terminating. Said combined lands contain 60.80 acres, more or less.
SOUTHWEST CORNER, SECTION 9
N29°10'41"E 3167.35
POB
S89°33'03"W 2658.00
SOUTH QUARTER CORNER, SECTION 9
MOTORPOOL ROAD
ENGINEER ROAD
MALMROS AVENUE
POINT A
S00°05'45"E 257.00
S00°05'45"E 3029.68
S00°05'45"E 2712.68
N89°31'36"E 811.70
N89°54'27"E 797.49
N89°54'27"E 253.04
N89°54'27"E 358.58
N03°09'24"E 252.01
N03°09'24"E 89.92
N03°09'24"E 2677.50
N03°09'24"E 3017.90
N49°48'23"E 43.80
N89°54'27"E 86.35
S89°45'30"W 819.40
N85°24'11"W 164.06
40' POWERLINE
100 YEAR FEMA FLOODWAY
ORIENTATION OF THIS BEARING SYSTEM IS BASED MORRISON COUNTY COORDINATES.
LEGEND
DENOTES FOUND MONUMENT
DENOTES SET 5/8" REBAR W/ CAP, LIC. NO. 42556
WOOD POST
POWER POLE
SANITARY MANHOLE
EDGE OF WOODS
EDGE OF GRAVEL
EXISTING CONTOURS
TELEPHONE PEDESTAL
SIGN
GUY WIRE
BURIED POWER
BURIED FIBER OPTIC
PROPERTY BOUNDARY
UTILITY EASEMENT
I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED LAND SURVEYOR UNDER THE LAWS OF THE STATE OF MINNESOTA.
Name, L.S.
Date: 07/17/2015
Lic. No. 42556
SEH
PHONE: 320.229.4300
1200 25TH AVENUE SOUTH
ST. CLOUD, MN 56301-4806
www.sehinc.com
SURVEY FOR:
CAMP RIPLEY / MINNESOTA POWER
scale 1" = 100'
DRAWN BY: MM
SURVEYED BY: BW
CHECKED BY: DW
SURVEY TEAM
NO. BY DATE REVISIONS
P:\KOM\MNPOW\132780\9-survey\92-CAD\15-dwg\Ex_Topo_Sheet.dwg 7/24/2015 11:11 AM mmoyry

Looking northerly along Motor Pool Road from SW corner of primary site.

Looking easterly along Malmros Avenue from west side of site.

Looking southerly along Motor Pool Road from NW corner of site.

Looking easterly along Engineer Road from NW corner of site.

Looking southerly down powerline corridor from NE corner of site.

Looking westerly along north property line (Engineer Road).

Looking northerly along east property line from Malmros Avenue.

Looking easterly along Malmros Avenue from east property line.

Looking southerly along east property line (powerline) from Malmros Avenue.

Looking easterly along Malmros Avenue from Motor Pool Road.

Looking southerly along Motor Pool Road from Malmros Avenue.

Looking easterly from Motor Pool Road along southerly property line.

Solar Array Site

Camp Ripley

ZONING

Morrison County provides zoning administration for all non-urban areas of the county. It does not provide zoning administration within the Camp Ripley Military Reservation.

Staff at Camp Ripley indicate that there is no distinct zoning code or policy that has been established and administered within reservation boundaries. Camp Ripley only distinguishes land use between the "development" areas, which is essentially the identified cantonment area in the very southeast corner of the reservation, and the undeveloped remainder of the reservation. Camp administration generally allows for structural improvements within the cantonment area that are consistent with the mission of Camp Ripley as a military reservation/training center.

Therefore, structural improvements would be permitted on the subject site as long as they were consistent with the goals, mission and other uses within the cantonment area.

The subject site is outside of the identified 100-year flood area of the Mississippi River as shown on the previous survey of the land.

Since the purpose of this assignment is to estimate market value for the property as though it were available to be sold and to be used in the market, it is necessary to assume that the land is actually outside of the reservation from a comparative standpoint and that it would have land use controls similar to other nearby lands that can be sold and used for general market purposes. This also assumes typical land use controls such as found in the surrounding townships which are administered by Morrison County.

Because the land actually has no established zoning or land use controls, the assumption that, in the market, the subject site would have similar controls and use as nearby parcels is an Extraordinary Assumption in the appraisal lexicon. This is defined in USPAP 2016-2017 as:

> ***Extraordinary Assumption**: an assumption, directly related to a specific assignment, as of the effective date of the assignment results, which, if found to be false, could alter the appraiser's opinions or conclusions.*
>
> > *Comment: Extraordinary assumptions presume as fact otherwise uncertain information about physical, legal, or economic characteristics of the subject property; or about conditions external to the property, such as market conditions or trends; or about the integrity of the data used in an analysis.*

The use of Extraordinary Assumption(s) may affect assignment results.

REAL ESTATE TAX ASSESSMENT

Information from the Morrison County auditor's office indicates that the subject property is tax exempt, and that the owner is identified as Camp Ripley. However, exempt properties do have valuation placed on them for some level of analysis.

The cantonment area is one identified parcel (12.0143.001) of 2,640 acres. Values have been assigned to this parcel as follows:

Land	$95,884,400
Buildings	568,751,300
Total	$664,635,700

Again, the military reservation is exempt from taxation, and no real estate tax is levied against the parcel. The subject 60.8 acres is a small portion of the lands identified for this parcel.

For comparative purposes, the Morrison County auditor was contacted to provide an estimate of real estate taxes for similar lands. Vacant lands located in adjoining Ripley Township and located in the Little Falls School District with an assessed value of $120,000 would have taxes approximating $3,000 when classed as commercial use.

HIGHEST AND BEST USE

The highest and best use of a particular site can be considered as that use which at the time of the appraisal is most likely to produce the greatest net return to the land and/or buildings over a given period of time.

Highest and best use is a judgement that takes into consideration the concepts of physically possible, legally permissible, financially feasible and maximally productive.

The subject property consists of 60.8 acres of vacant, level land. The site has direct, gravel road access on three sides.

This site is located within the cantonment (developed) area of the Camp Ripley military reservation. Use of the property is not governed by any local or county zoning ordinance and camp administration does not have a defined land use plan. As pointed out earlier in the report, lands within the military reservation cannot be sold. Any market value estimate will rely on land sales outside the reservation and those lands will have normal land use controls such as county zoning.

Therefore, the subject site is assumed to have potential uses consistent with the available land sales from townships surrounding Camp Ripley.

Based on the moderate and reasonable number of available land sales researched for this assignment, demand exists in the area for similar size tracts of land to be used for agricultural, rural residential or recreational activities. So, absent the constraints of the military reservation, it is concluded that the 60.8 acre subject site would be used in the market for agricultural, rural residential or recreational purposes.

VALUATION PROCEDURE

Traditional appraisal practice uses three recognized indicators of value: the cost, income and sales comparison approaches.

A cost approach estimates the value of land which is added to the replacement cost new of the improvements less applicable depreciation. This method is most reliable for newer structures on land improved to its highest and best use.

An income approach is based upon the principle of anticipation. It estimates the potential income for a property, deducts relevant expenses to arrive at a net operating income, and then converts that income into an estimate of value.

Sales comparison is an appraisal method based upon collecting sales data for similar properties and directly comparing the sales to the subject property to arrive at a value estimate. It is most reliable when a sufficient number of properties closely resembling the subject are available for the comparison process.

The subject is a parcel of vacant land within a military reservation without established land use regulations and restricted as to conveyance.

Because the subject is vacant land, a cost approach to value cannot be performed for such a property. Income methods are also not applicable since similar sites are not commonly leased in the marketplace. Therefore, no cost or income approaches will be developed herein.

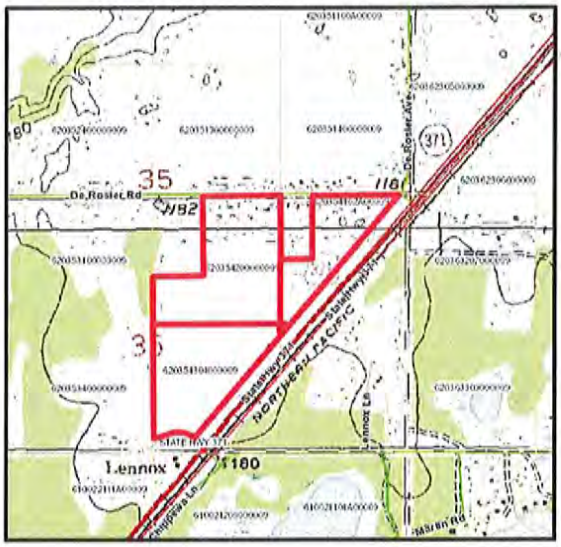
A value estimate will rely on a sales comparison approach to value. However, since the land is unable to be sold within the military reservation, a market value estimate will rely on sales of nearby lands outside the reservation and will also view the land as being outside of the military reservation. The resulting land value estimate will be a "prevailing" land value from the area surrounding the southern portion of Camp Ripley.

Land Sale 1

Location:	Crow Wing Lake Road Fort Ripley Township Crow Wing County, Minnesota
Seller:	Joseph Roskop Trust
Buyer:	Gilbert Michalski Jr., et ux
Date of Sale:	June 2015
Legal:	Part of NW ¼ - SE ¼; and Part of GL 4, Section 1, T43-R32
PIN:	610014200B00009 + 610014200000009
Land Area:	36.55 acres
Price:	$92,500
Price/Acre:	$2,531

Comments: Comparable is a parcel of level plantation land a short distance east of Crow Wing Lake and Highway 371.

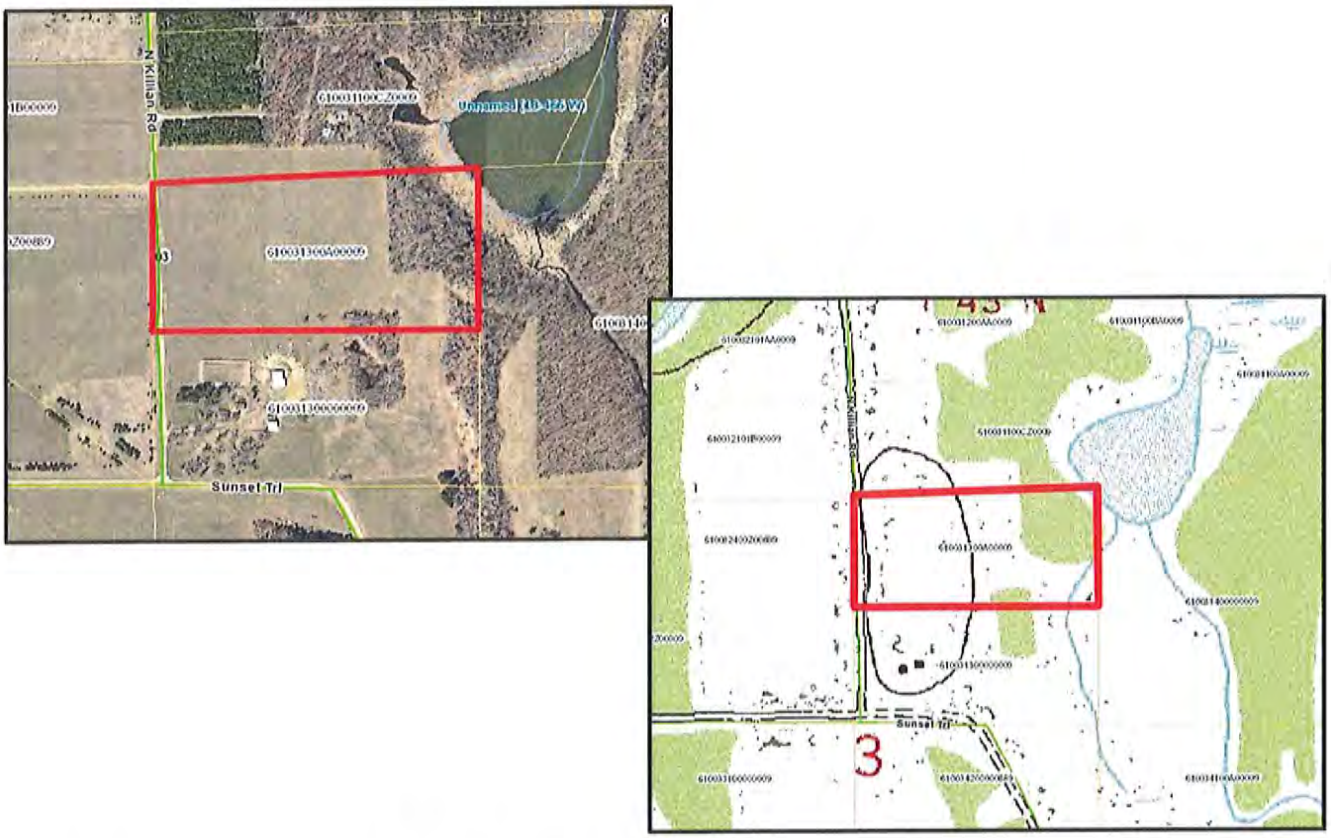
Land Sale 2



Location:	DeRosier Road Fort Ripley Township Crow Wing County, Minnesota
Seller:	Peoples National Bank of Mora
Buyer:	Patrick and Maria DeRosier
Date of Sale:	July 2014
Legal:	Part of Lot 2 and Part NW ¼ - SE ¼; Section 35, T43-R32
PIN:	620354200000009 +620354102A00009 + 620354403000009 + 620354304000009
Land Area:	70.0 acres
Price:	$126,034
Price/Acre:	$1,800

Comments: Comparable is an irregular, somewhat triangular parcel of level plantation land on the west side of Highway 371 with town road access on the north and south sides. The buyer held adjacent lands.

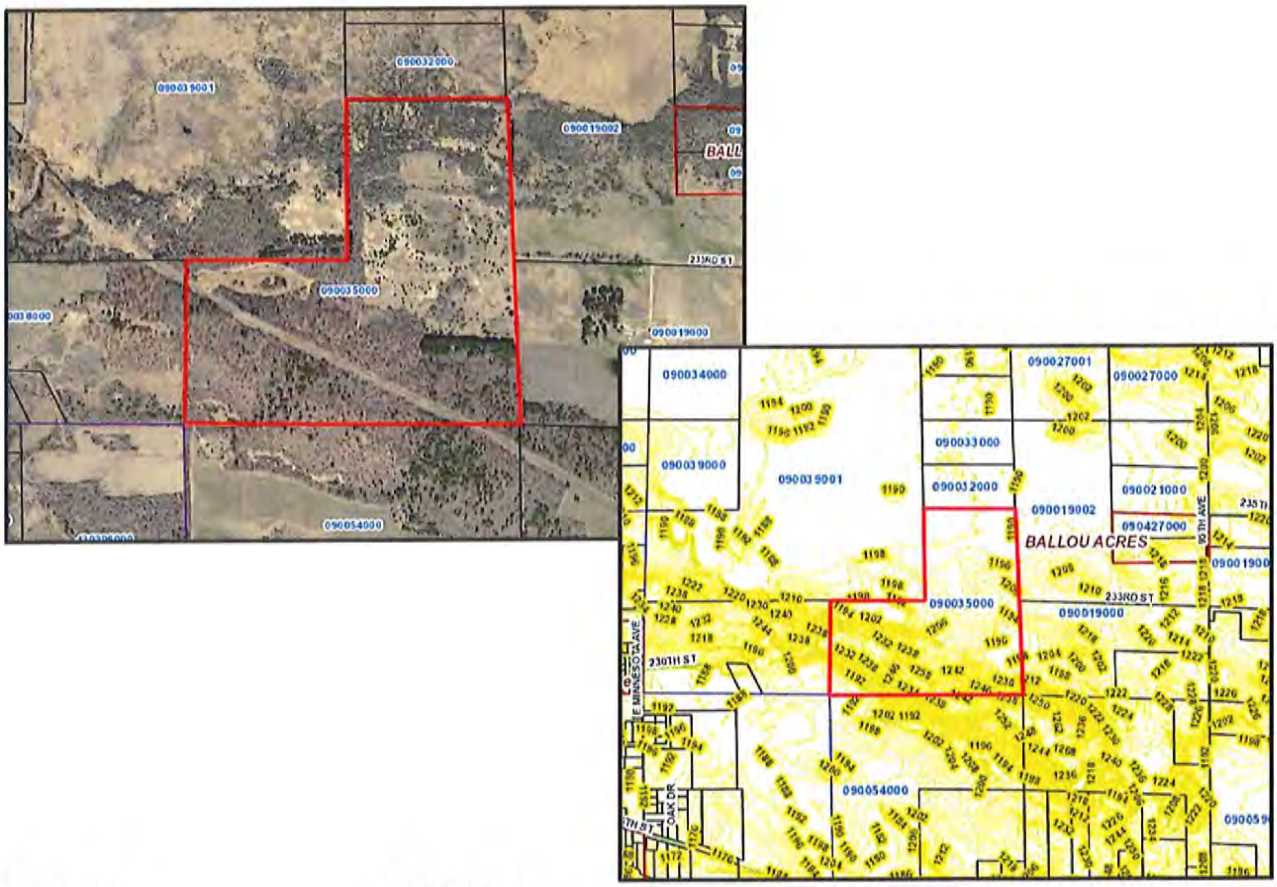
Land Sale 3



Location:	Killian Road Fort Ripley Township Crow Wing County, Minnesota
Seller:	Michael and Denise Reeser
Buyer:	Larry and Pam Japp
Date of Sale:	July 2015
Legal:	NE ½ - SW ¼ - NE ¼, Section 3, T43-R32
PIN:	610031300A00009
Land Area:	18.54 acres
Price:	$40,000
Price/Acre	$2,157

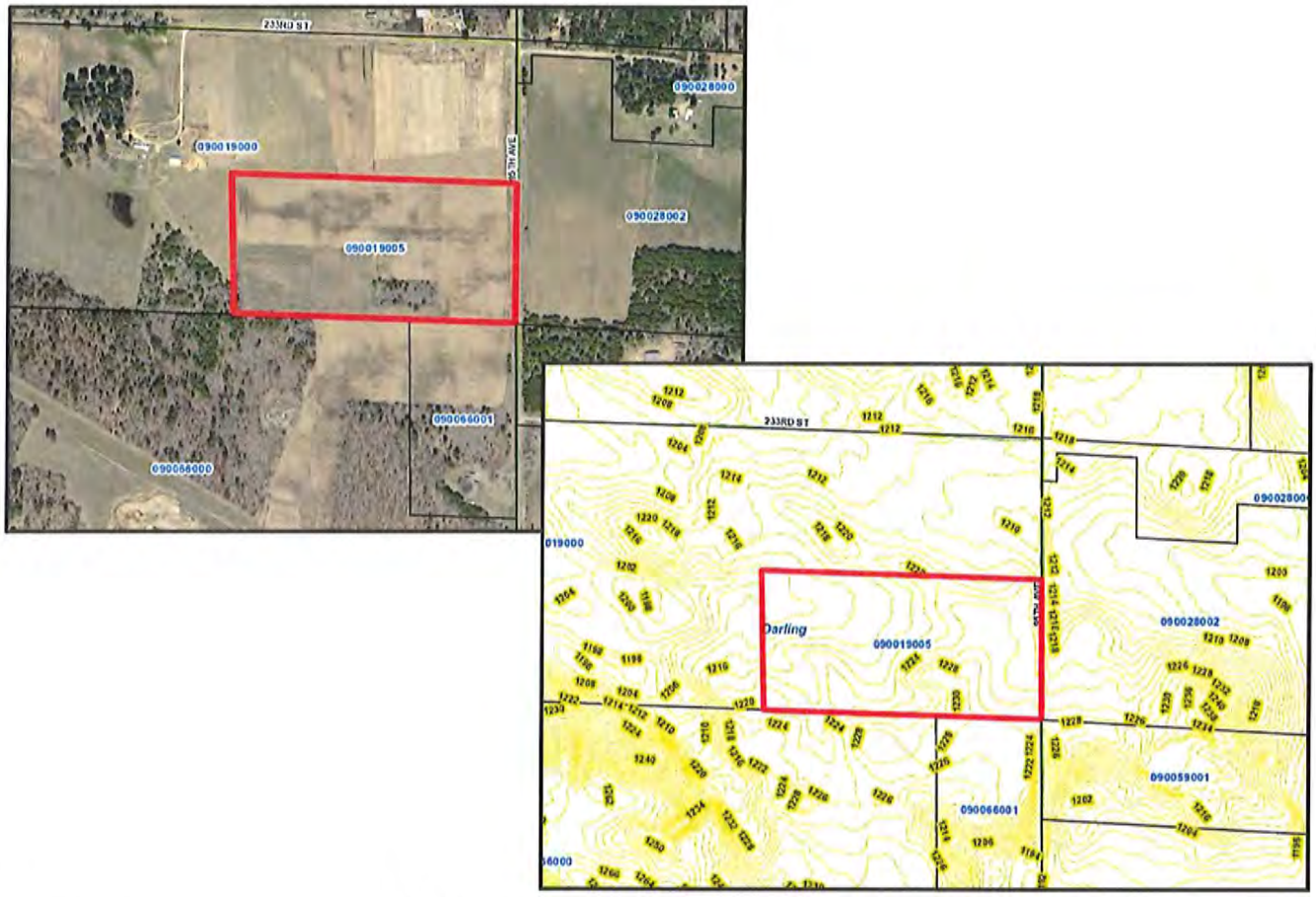
Comments: Comparable is a smaller parcel of partially wooded, but mostly pasture agricultural land. The buyer did own adjacent lands.

Land Sale 4



Location:	223rd Street Darling Township Morrison County, Minnesota
Seller:	Dorothy Burgardt
Buyer:	Robert and Roberta Ritters
Date of Sale:	May 2015
Legal:	S ½ - SE ¼ and NE ¼ - SE ¼, Section 5, T130-R30
PIN:	09.0035.000
Land Area:	120 acres
Price:	$240,000
Price/Acre:	$2,000
Comments:	Comparable is a larger parcel of land which is wooded and agricultural in character. Location is two miles west of Camp Ripley.

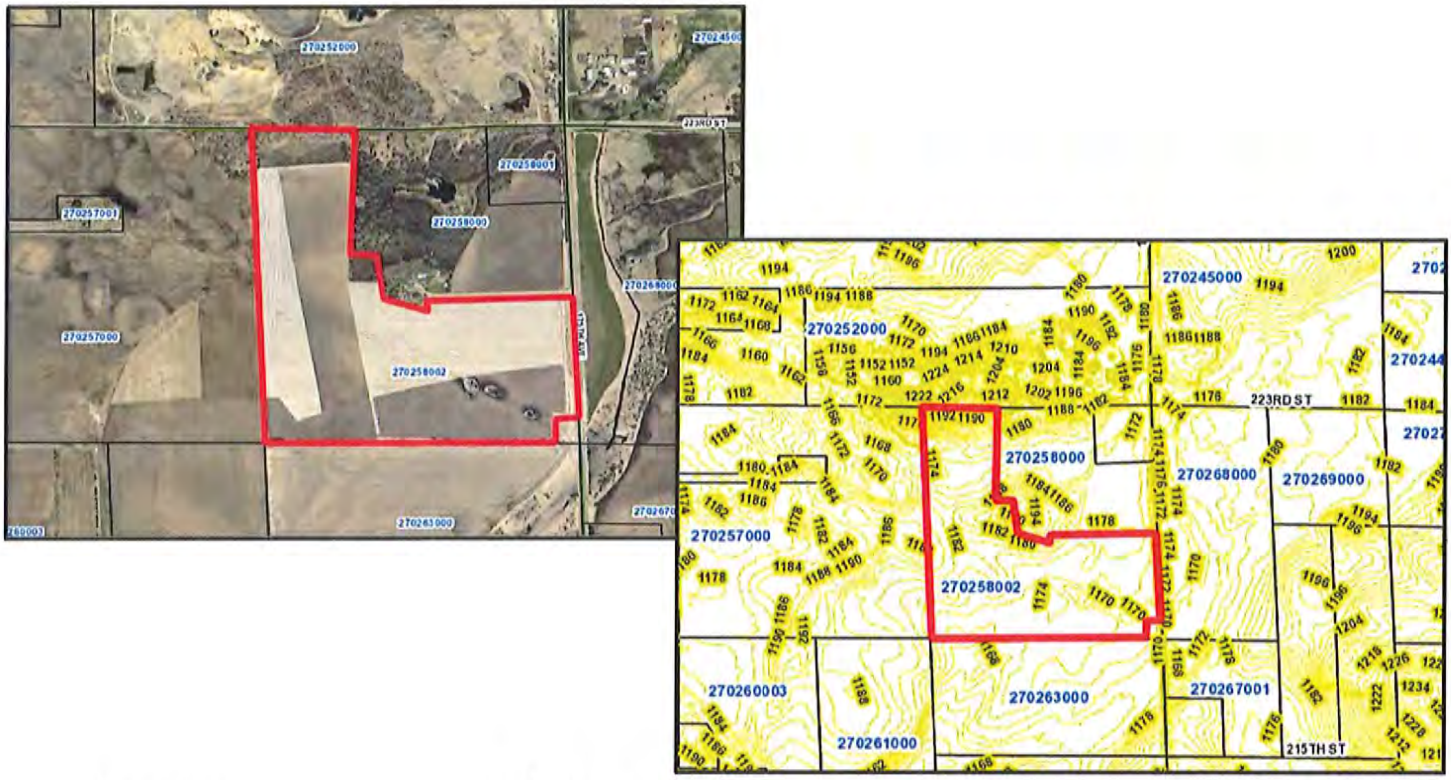
Land Sale 5



Location:	95th Avenue Darling Township Morrison County, Minnesota
Seller:	Ardell Killeaney
Buyer:	T. Frerich and D. Van Heel
Date of Sale:	October 2015
Legal:	S ½ - SE ¼ - SW ¼, Section 4, T130-R30
PIN:	09.0019.005
Land Area:	20 acres
Price:	$54,000
Price/Acre:	$2,700

Comments: Comparable is a smaller parcel of level, open agricultural land. It is two miles west of Camp Ripley.

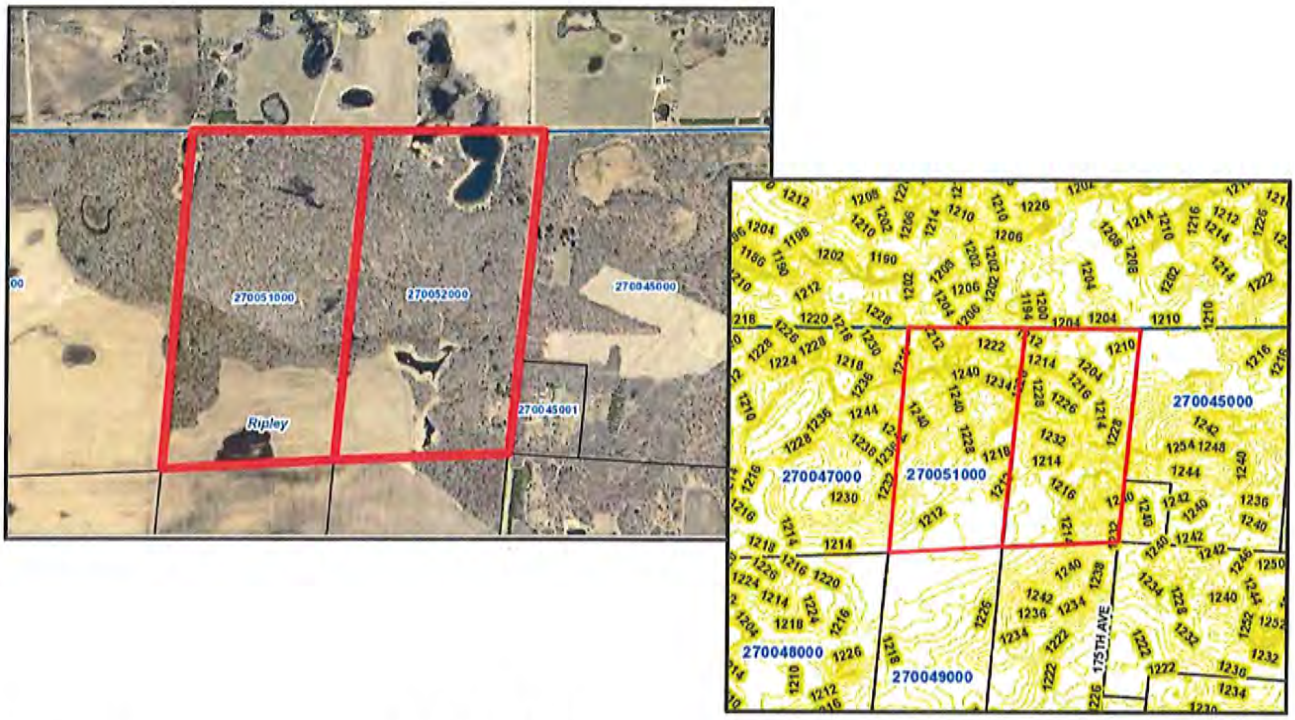
Land Sale 6



Location:	175th Avenue Ripley Township Morrison County, Minnesota
Seller:	John Schilling
Buyer:	Joseph and Nancy Berg Properties, LLC
Date of Sale:	February 2016
Legal:	Part of NE ¼, Section 31, T42-R31
PIN:	27.0258.002
Land Area:	100.76 acres
Price:	$210,000
Price/Acre:	$22,084

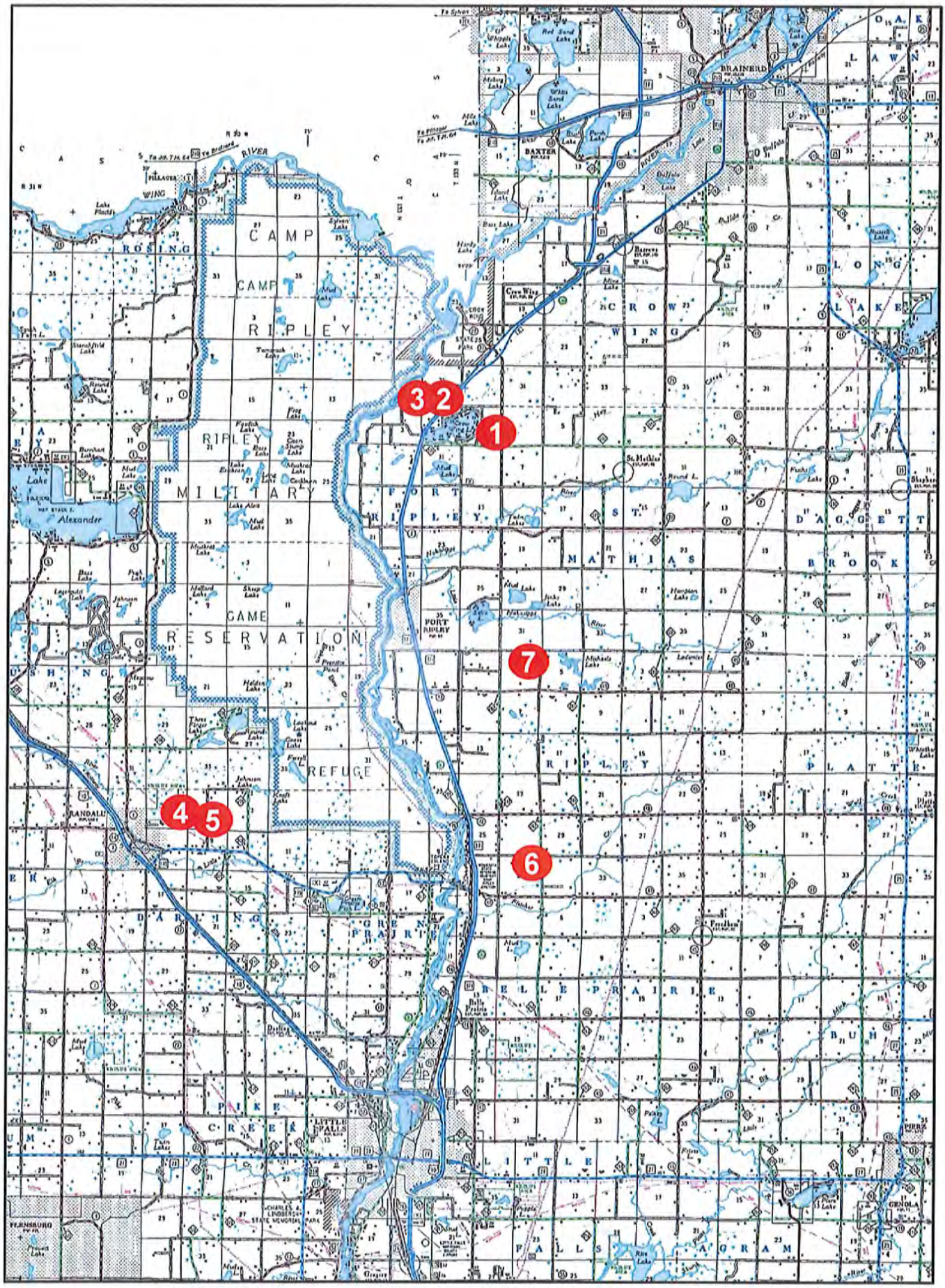
Comments: Comparable is a larger parcel of open agricultural land. It has gravel road access on the east and north sides. This location is ± 2 miles east of the southeast corner of Camp Ripley.

Land Sale 7



Location:	26901 175th Avenue Ripley Township Morrison County, Minnesota
Seller:	Eva Keehr
Buyer:	Joseph and Angela Nelson
Date of Sale:	October 2014
Legal:	W ½ of NE ¼, Section 6 and E ½ - NE ¼, Section 6, T42-R31
PIN:	27.0052.000 + 27.0051.000
Land Area:	150.5 acres
Price:	$350,000
Price/Acre:	$2,326

Comments: Comparable is a quarter section of wooded open agricultural lands with gravel road access on the east and north sides. Assessment records indicate a nominal building value, but reported intended use is agriculture.



Land Sale Map

Basic land sale information is summarized in the chart below.

Sale	Date	Acres	Price	Price/Acre
1	6/15	36.55	$92,500	$2,531
2	7/14	70.0	126,034	1,800
3	7/15	18.54	40,000	2,157
4	5/15	120	240,000	2,000
5	10/15	20	54,000	2,700
6	02/16	100.76	210,00	2,084
7	10/14	150.5	350,000	2,326
	Averages	73.8	$158,933	$2,228
	Weighted Average			$2,154

Sale prices range from $1,800 per acre to $2,700 per acre with an average of $2,228 per acre and a weighted average of $2,154 per acre. Sales 1, 3 and 5 are smaller parcels than the subject and tend to have a higher per acre price.

Sale 7 is the largest parcel at 150.5 acres, and yet has one of the higher per acre prices. The property assessment recognizes a modest assessed value for buildings at the time of sale. Values for 2014 were:

Land	$287,684
Building	20,726 (15% of total)
Total	$308,410

Adjusting the price by 15 percent for building improvements reduces the land price to $297,500 and the unit price to $1,977 per acres. This is more in keeping with the tradition size/value relationship of the datasets. The adjusted price for Sale 7 results in average sale price for the seven sales of $2,178 per acre and a weighted average of $2,053.

All sales are in close proximity to Camp Ripley and all sales occurred within the previous 20 months. All lands were generally usable and all sites had road access. Therefore, this dataset is considered a very good indicator of prevailing land value in the area immediately surrounding the southern end of Camp Ripley. A value estimate can reasonably and credibly be concluded at $2,100 per acre.

60.8 acres x $2,100 per acre = $127,680
Rounded to: $128,000

As mentioned earlier in this report, this market value estimate is essentially the estimated value of the land only and does not consider or include amenities from within the fence of the Camp Ripley Military Reservation such as fencing, proximity to fire protection, proximity to full time security, and use without real estate taxation.

CERTIFICATION

I certify that, to the best of my knowledge and belief:

The statements of fact contained in this report are true and correct.

The reported analyses, opinions, and conclusions are limited only by the reported assumptions and limiting conditions, and are my personal, impartial, and unbiased professional analyses, opinions, and conclusions.

I have no present or prospective interest in the property that is the subject of this report and I have no personal interest with respect to the parties involved.

I have not provided real estate valuation services regarding the property that is the subject of this report within the three-year period immediately preceding acceptance of this assignment.

I have no bias with respect to the property that is the subject of this report or to the parties involved with this assignment.

My engagement in this assignment was not contingent upon developing or reporting predetermined results.

My compensation is not contingent upon the reporting of a predetermined value or direction in value that favors the cause of my client, the amount of the value estimate, the attainment of a stipulated result, or the occurrence of a subsequent event directly related to the intended use of this appraisal.

I have inspected the property that is the subject of this report.

No one provided significant real property appraisal assistance to the person signing this report.

The reported analyses, opinions, and conclusions were developed, and this report has been prepared, in conformity with the requirements of the Code of Professional Ethics and Standards of Professional Appraisal Practice of the Appraisal Institute, which include the Uniform Standards of Professional Appraisal Practice.

The use of this report is subject to the requirements of the Appraisal Institute relating to review by its duly authorized representatives.

As of the date of this report, the undersigned, Gary A. Battuello, has completed the continuing education program for Designated Members of the Appraisal Institute.

Gary A. Battuello, MAI
Certified General Real Estate Appraiser
Minnesota License #4000939

ADDENDA

ASSUMPTIONS AND LIMITING CONDITIONS:

1. This Appraisal Report is intended to comply with the reporting requirements set forth under Standard Rule 2-2(a) of the Uniform Standards of Professional Appraisal Practice. As such, it contains discussions of the data, reasoning, and analyses used in the appraisal process to develop the appraiser's opinion of value. Supporting documentation concerning the data, reasoning, and analyses is retained in the appraiser's file. The information contained in this report is specific to the needs of the client and for the intended use stated in this report. The appraiser is not responsible for unauthorized use of this report.

2. No responsibility is assumed for legal or title considerations. Title to the property is assumed to be good and marketable unless otherwise stated in this report.

3. The property is appraised free and clear of any or all liens and encumbrances unless otherwise stated in this report.

4. Responsible ownership and competent property management are assumed unless otherwise stated in this report.

5. The information furnished by others is believed to be reliable. However, no warranty is given for its accuracy.

6. All engineering is assumed to be correct. Any plot plans and illustrative material in this report are included only to assist the reader in visualizing the property.

7. It is assumed that there are no hidden or unapparent conditions of the property, subsoil, or structures that render it more or less valuable. No responsibility is assumed for such conditions or for arranging for engineering studies that may be required to discover them.

8. It is assumed that there is full compliance with all applicable federal, state, and local environmental regulations and laws unless otherwise stated in this report.

9. It is assumed that all applicable zoning and use regulations and restrictions have been complied with, unless a non-conformity has been stated, defined, and considered in this appraisal report.

10. It is assumed that all required licenses, certificates of occupancy, or other legislative or administrative authority from any local, state, or national governmental, or private entity or organization have been or can be obtained or renewed for any use on which the value estimates contained in this report are based.

11. Any sketch in this report may show approximate dimensions and is included to assist the reader in visualizing the property. Maps and exhibits found in this report are provided for reader reference purposes only. No guarantee as to accuracy is expressed or implied unless otherwise stated in this report. No survey has been made for the purpose of this report.

12. It is assumed that the utilization of the land and improvements is within the boundaries or property lines of the property described and that there is no encroachment or trespass unless otherwise stated in this report.

13. The appraiser is not qualified to detect hazardous waste and/or toxic materials. Any comment by the appraiser that might suggest the possibility of the presence of such substances should not be taken as confirmation of the presence of hazardous waste and/or toxic materials. Such determination would require investigation by a qualified expert in the field of environmental assessment. The presence of substances such as asbestos, urea-formaldehyde foam insulation, or other potentially hazardous materials may affect the value of the property. The appraiser's value estimate is predicated on the assumption that there is no such material on or in the property that would cause a loss in value unless otherwise stated in this report. No responsibility is assumed for any environmental conditions, or for any expertise or engineering knowledge required to discover them. The appraiser's descriptions and resulting comments are the result of the routine observations made during the appraisal process.

14. The exhibits found herein are included to assist the reader in visualizing the property. The appraisers assume no responsibility in connection with the accuracy of such items.

15. Any proposed improvements are assumed to be completed in a good, workmanlike manner in accordance with the submitted plans and specifications.

16. The distribution, if any, of the total valuation in this report between land and improvements applies only under the stated program of utilization. The separate allocations for land and buildings must not be used in conjunction with any other appraisal and are invalid if so used.

17. Possession of this report, or a copy thereof, does not carry with it the right of publication. It may not be used for any purpose by any person other than the party to whom it is addressed without the written consent of the appraiser, and in any event, only with proper written qualification and only in its entirety.

18. Neither all nor any part of the contents of this report (especially any conclusions as to value, the identity of the appraiser, or the firm with which the appraiser is connected) shall be disseminated to the public through advertising, public relations, news sales, or other media without prior written consent and approval of the appraiser.

19. The Americans with Disabilities Act, "ADA," became effective January 26, 1992. The appraiser has not made a specific compliance survey/analysis of this property to determine whether or not it is in conformity with the various detailed requirements of the ADA. It is possible that a compliance survey of the property, together with a detailed analysis of the requirements of the ADA, could reveal that the property is not in compliance with one or more of the requirements of the Act. If so, this fact may have a negative effect upon the value of the property. Since there is no direct evidence relating to this issue, non-compliance with the requirements of ADA has not been considered in estimating the value of the property.

QUALIFICATIONS OF THE APPRAISER

Gary A. Battuello, MAI

Present Position:	Ramsland & Vigen, Inc. (1981 - present) Real Estate Appraisers & Consultants 302 West Superior Street #600 Duluth, Minnesota
Member:	Appraisal Institute – North Star Chapter MAI Designation, Certificate No. 7477 AI-GRS Designation, 2014 Lake Superior Chapter – President 1993, 2004-2005
Licenses:	Minnesota Real Estate Appraiser - #4000939 (Cert General) Wisconsin Real Estate Appraiser - #16-10 (Cert General) Illinois Real Estate Appraiser - #553.002118 (Cert General)
Academic Education:	University of Minnesota Graduate School of Business and Economics Masters of Business Administration (1992) University of Wisconsin-Superior Data Processing Major, B. S. - Summa Cum Laude (1983) Michigan Technological University Engineering (1970 - 1972)
Appraisal Education:	SREA Courses, University of Wisconsin Course 101 (1977) R-2 examination (1978) Narrative Report Seminar (1978) AIREA Courses, University of Minnesota Capitalization II and III (1983) 2-2, Report Writing (1984) 2-3, Standards of Professional Practice (1985) General Review Theory (2014) AIREA Examinations Capitalization I (1983) 1A-2, Procedures (1984) 2-1, Case Studies (1984) 6, Real Estate Investment Analysis (1985) Recent Appraisal Institute Seminars USPAP Update (2014) Subdivision Valuation (2013) DCF Model: Concepts, Issues & Apps (2013) Business Practices & Ethics (2013) USPAP Update (2013) Internet Search Strategies – (2011) Appraisal Review – General (2011)

Battuello (continued)

Publications:

"Appraisal Issues in the Valuation of Extremely Large Buildings," *The Appraisal Journal,* (October 1996): 394-398, The Appraisal Institute, Chicago

"The Impact of Real Property Taxation Upon Economic Development," Master's Dissertation, 1992, University of Minnesota

Mr. Battuello is an acknowledged contributor to the recently published "Appraising Industrial Properties" text of the Appraisal Institute (2005)

Partial List of Clients:

Allete/Minnesota Power
Aluminum Corporation of America (ALCOA)
Burlington Northern Santa Fe Railroad
Canadian National Railway
Enbridge Energy Ltd Partnership
Federated Department Stores
Ford Motor Company
General Electric
Great Lakes Gas Transmission Company
J C Penney Company Inc
Kraft Foods
Minnesota Department of Transportation
Sears Holding Corporation
Tate & Lyle (formerly A E Staley)
United States Steel

The Appraisal Institute conducts a voluntary program of continuing education for its designated members. MAIs and RMs who meet the minimum standards of this program are awarded periodic educational certification. I am currently certified under this program.

BURNS McDONNELL

April 15, 2016

Mr. Kristopher Spenningsby, P.E.
Supervisor – Retail Accounts
Minnesota Power
30 West Superior Street
Duluth, MN 55802-2093

Re: Camp Ripley Solar Land Lease Agreement – Land Use Permit and Site Security

Dear Mr. Spenningsby:

Burns & McDonnell reviewed the likely cost savings that can be expected by locating the 10 MW Camp Ripley Solar project (Project) on property leased from the Minnesota Army National Guard. The site lease on Army National Guard property is an alternative to the purchase or lease of private land parcel(s). If private lands were utilized for the Project, there are a number of additional requirements placed on the project owner. This review focuses on two additional cost items and one potential cost savings:

1. If the Project is located on private property, receipt of a conditional use permit from Morrison County allowing for construction and operation of a solar PV project on property that does not currently allow power generation from a PV facility would be required.
2. Construction of the Project in a security controlled environment within Camp Ripley will eliminate the need for overnight site security during construction of the Project and security responses that may be required to address vandalism, theft, intrusion or other site threats during operation of the Project.
3. If the Project is located within Camp Ripley, the initial fire response would be provided by National Guard personnel and would likely occur in less time than a typical response from the local fire department due to the close proximity of the Camp Ripley fire response personnel. With a quicker response time, damage to Project equipment could be reduced. As a result, insurance premiums for the Project would likely be lower. Insurance premium reductions are not quantified in this document. As such, those savings would be in addition to the savings estimates provided in this review.

The following analysis quantifies the benefits the Project will receive by being located within Camp Ripley. While it is possible savings could be higher or lower depending upon the location of an alternate, private land parcel(s) and on the frequency of actions that require a security response, the approach within this review can be considered as the expected case, neither unreasonably high nor unreasonably low.

9400 Ward Parkway \ Kansas City, MO 64114
O 816-333-9400 \ **F** 816-333-3690 \ burnsmcd.com

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Morrison County Conditional Use Permit

The Project is located in Morrison County Minnesota. If it is not sited on Camp Ripley property, a conditional use permit from the Morrison County Planning Commission will be required in order to construct and operate the facility. The key steps necessary to obtain a conditional use permit are as follows:

1. Prepare and submit a Development Review Team (DRT) meeting application to the Planning & Zoning department
    a. Provide preliminary site plan, property boundaries, proposed structures, and property line setbacks
2. Attend the DRT meeting and provide project information
3. Prepare and submit the conditional use permit application. Provide the following information:
    a. Interconnection agreement
    b. Stormwater and erosion control plan
    c. Foundation designs
    d. Proof of compliance with applicable codes
    e. Detailed site plan with equipment and environmental attributes
    f. Natural resource impact assessment
    g. Aviation analysis
    h. Decommissioning plan
4. Prepare and submit an application for a conditional use permit public hearing
    a. Public hearing fee of $500 and a recording fee of $46
5. Pay the conditional use permit fee. For a solar plant, the fee is $250/MW. With a 10 MW capacity, the fee for the Project would be $2,500.
6. Issue public notices to area property owners
7. Attend the conditional use public meeting
8. Solicit input from property owners and address concerns (this step may require additional public meetings)
9. Attend the County Board hearing

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Table 1 – Expected Conditional Use Permit Costs

	Action/Task	Internal Hours[1]	External (Consultant) Hours[1]	Total Cost
1	Prepare/submit DRT meeting application	1	1	$300
2	Attend DRT meeting	3	10	$2,300
3	Prepare/submit conditional use permit[2]	1	3	$700
4	Prepare/submit application for condition use public hearing	2	-	$200
5	Public hearing fee[3]	-	-	$546
6	Conditional use permit fee[4]	-	-	$2,500
7	Prepare for and attend public meeting	20	40	$10,000
8	Address public questions and concerns	20	20	$6,000
9	Prepare for and attend County Board hearing	3	10	$2,300
			Total Cost	**$24,846**

Notes
1. Average cost for fully loaded internal labor is $100/hr and consultant cost is $200/hr.
2. Assumes all drawings, data, studies, assessments, etc. are being completed for the Project regardless of its location on private land or Camp Ripley property. Additional time and costs to complete work in support of the conditional use permit have not been included.
3. The public hearing fee is $500 with a recording fee of $46, for a total cost of $546.
4. The conditional use permit fee for a solar plant is $250/MW. For the Project, the total cost would be $250/MW x 10 MW = $2,500.

For comparative purposes, Burns & McDonnell has assisted with other solar PV projects that required conditional use permits. The activities required to obtain those permits were not identical to the requirements of Morrison County, but the processes have similarities. The cost for Burns & McDonnell to obtain the permits were as follows:

- Maricopa County, AZ – $70,000 (400 hours)
- Kern County, CA – $35,000 (200 hours)

- Clark County, NV – $35,000 (200 hours)

Security Response Savings

The added security provided by locating the Project on Camp Ripley will result in operational savings as well as reductions in property losses that may occur due to theft and vandalism. From an operational savings standpoint, there will be significant cost reduction during construction due to the elimination of the need for overnight, onsite security. Typically, when solar projects are constructed on unsecured property, 24-hour security is required. Since construction activities are typically ongoing during the day, a security guard is required for approximately 12 hours each night at a cost of $15-25/hr, depending on the level of skill and whether the security officer is armed or unarmed. The Project is expected to require seven months for construction. If the low end of the security guard cost range is used, the cost equates to:

7 months x 30 days/month x 12 hours/day x $15/hr = $37,800

Once the Project enters operations, it will primarily be unmanned, except during periods of routine maintenance and inspection. As an unmanned facility, if it is located in an unsecured environment, there will be security alarms that occur from time to time that require resources to be dispatched in order to determine the reason for the alarm. When a dispatch occurs, a line worker or substation technician will be sent to the site. The alarms, typically due to vandalism, intrusion, theft, or false alarm due to an equipment malfunction, usually occur at night. This results in premium pay to the technician, as well as the cost of dispatching the truck. For purposes of quantifying the cost of the alarms, it is assumed the rate of alarms will average one per month, or twelve alarms per year. The annual cost for investigating the cause of the alarms would be:

12 alarms/yr x 4 hours/alarm x $95/hr[1] = $4,560/yr

If any of the alarms are the result of vandalism or theft, there would be additional costs to repair the damage and/or replace materials impacted by the act. Vandalism or theft could result in damage to perimeter fencing, control house door damage from forced entry, cleaning or repainting of buildings or equipment that are vandalized with aerosol paint, theft of equipment or supplies, theft of materials such as copper or aluminum, theft of computer equipment or other valuable electronics, vandalism or breakage of modules, and other acts that result in costly repairs and equipment replacement. It is difficult to quantify the costs of such acts in advance of

[1] Where $95/hr is the average labor cost, including truck and overtime charges

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their occurrence, but a low estimate of the cost to repair minimal damage on an annual basis is $5,000. If vandalism or theft occurs, it is possible that repair costs could be significantly higher.

Summary

As described in this analysis, there are significant savings to the Project that result from being located on Camp Ripley. The savings from not being required to obtain a conditional use permit are approximately $24,800. The savings from not needing overnight security during construction of the Project are $37,800. Finally, there will be an annual estimated savings of $4,560 and $5,000 due to the elimination of site alarms that require response from an offsite utility employee and repair costs due to vandalism or theft.

Sincerely,

Bryan Hawthorne

Bryan Hawthorne, PE
Global Practice Regional Manager

Sample Calculation of Alternative Solar Energy Adjustment (SEA)

Assuming No Solar Energy Purchases

	Assumptions*	**MWhs**	**cost / MWh**	**total cost**
	Generation before "Time of Generation Adjustment" (TOGA)			
A	Non-solar generation	900,000	$15	$13,500,000
B	Solar generation	5,000	$0	$0
C	Total generation	905,000		$13,500,000
D	TOGA Factor	0.12		
	Customer usage (load) MWhs			
E	Non solar-paying load	600,000		
F	Solar-paying load	305,000		
G	Total customer usage	905,000		

**Note that these assumptions are for illustration purposes only and do not include actual costs or customer usage; also, the example does not include any solar costs which would be included in the Solar Renewable Factor within the Renewable Resources Rider.*

	Step 1: Calculate FPE Adjustment without solar		
H	FPE costs excluding solar (A)	$13,500,000	
I	Non-solar generation MWhs (A)	900,000	
J	FPE Adjustment without solar (H/I)	$15.00	
	Step 2: Calculate TOGA		
K	TOGA Factor (D)	0.12	
L	Solar-generation MWhs (B)	5,000	
M	FPE Adjustment without solar (J)	$15.00	
N	TOGA (K*L*M)	$9,000	
	Step 3: Calculate TOGA-adjusted FPE Adjustment		
O	FPE costs excluding solar (H)	$13,500,000	
P	TOGA (N)	$9,000	
Q	Non-solar generation MWhs (I)	900,000	
R	TOGA-adjusted FPE Adjustment ([O+P]/Q)	$15.01	*To be applied to all customer usage MWhs*
	Step 4: Calculate credit for use in SEA		
S	Solar generation MWhs (B)	5,000	
T	TOGA-adjusted FPE Adjustment (R)	$15.01	
U	Add TOGA (N)	$9,000	
V	Credit for use in SEA ([S*T]+U)	$84,050	*Credit for costs already allocated through the FPE Rider, plus a time of generation adjustment*
	Step 5: Calculate SEA		
W	Solar energy purchase cost (B)	$0	*Solar purchases would be included here*
X	Credit for use in SEA (-V)	($84,050)	
Y	Net solar (credits) costs (W+X)	($84,050)	
Z	Solar-paying energy sales MWh (F)	305,000	
AA	SEA (Y/Z)	($0.28)	*To be applied to solar customer usage MWhs*
	Verification		
AB	TOGA-adjusted FPE Adjustment (R)	$15.01	
AC	Total customer usage MWhs (G)	905,000	
AD	Total amount billed with FPE Adjustment (AB*AC)	$13,584,050	
AE	SEA (AA)	($0.28)	
AF	Solar-paying energy sales MWhs (F)	305,000	
AG	Total amount billed (credited) with SEA (AE*AF)	($84,050)	
AH	Total amount billed with FPE Adjustment and SEA (AD+AG)	$13,500,000	
AI	Compare with total cost in Assumptions (C)	$13,500,000	
AJ	Verification of methodology (AH-AI)	$0	*Result of $0 shows all costs are recovered through riders*

Time of Generation Adjustment (TOGA) Factor
Sample Calculation - May 2015

The TOGA Factor is an adjustment which is applied to the base FPE Adjustment. The purpose is to quantify the value of the time of generation for solar energy in order to appropriately compensate solar-paying customers for the time the solar energy is produced, rather than applying a 24-hour average, which is the method for calculating the base FPE Adjustment.

Data and Assumptions*

**For demonstration purposes, only 24 hours of data from the month is included below, although the totals are based on data for the entire month. Actual calculations will include hourly data for two of the previous three months.*

Hour	MP avoided costs	solar gen kwh	cost x solar gen
	$ per MWh	kwh	$
1	$20.45	-	$0
2	$17.35	-	$0
3	$17.39	-	$0
4	$20.35	-	$0
5	$26.28	-	$0
6	$25.71	50	$1
7	$25.51	621	$16
8	$27.57	1,669	$46
9	$32.67	4,224	$138
10	$31.22	6,314	$197
11	$31.83	7,981	$254
12	$31.05	6,565	$204
13	$31.43	8,818	$277
14	$31.74	9,480	$301
15	$31.72	9,470	$300
16	$30.35	7,447	$226
17	$30.61	4,641	$142
18	$29.16	4,004	$117
19	$27.03	2,416	$65
20	$27.65	569	$16
21	$28.93	77	$2
22	$27.50	-	$0
23	$23.71	-	$0
24	$21.38	-	$0
Monthly Totals	$27.03	1,353,679	$40,945
	A (monthly avg)	B (monthly total)	C (monthly total)

Step 1: **Calculate average of hourly projected avoided cost for the latest billing month**

A — Source: production model that projects avoided cost calculation as described in Minn. Statute § 216B.164, subd. 3(b)., $/MWh — $ 27.03

Use average hourly data for two of the previous three months, consistent with FPE Rider calculation

Step 2: **Calculate total hourly solar generation**

B — Total in kWh — 1,353,679

Use total hourly data for two of the previous three months, consistent with FPE Rider calculation

Step 3: **Calculate weighted average solar generation cost**

C — Multiply hourly avoided cost data by hourly solar generation / 1000 (A*B/1000) and sum the total for the month — $40,945

Step 4: **Calculate weighted average solar generation cost in $/MWh**

D — Convert value to $/MWh (C/B*1000) — $30.25

This is to determine marginal time of generation

Step 5: **Calculate TOGA Factor** — 0.12

E — Calculates adjustment factor of solar proxy value to market data ([D/A]-1)

RIDER FOR FUEL AND PURCHASED ENERGY ADJUSTMENT

FUEL AND PURCHASED ENERGY ADJUSTMENT

Applicable to electric service under all Company's Retail Rate Schedules except Competitive Rate Schedules Rate Codes 73 and 79 and Erie Mine Site Service Schedule - Rate Code 72.

There shall be added to or deducted from the monthly bill an amount per kilowatt-hour determined as the amount by which the Fuel and Purchased Energy Costs divided by the actual Kilowatt-Hour Sales is greater than or less than the Base Cost of Energy as specified below.

The System Average Fuel and Purchased Energy (FPE) Cost shall be the FPE Cost divided by the Kilowatt-Hour Sales. The System Average FPE Adjustment shall be the System Average FPE Cost less the System Average Base Cost of Energy. The applicable FPE Adjustment will be included monthly on each customer's bill according to customer's rate class.

AVERAGE FUEL AND PURCHASED ENERGY COST

The Fuel and Purchased Energy Cost shall be the **sum** of the following during the first two of the preceding three months:

(a) The fossil and nuclear fuel consumed in Company's generating stations,

(b) The net energy cost of energy purchases, exclusive of capacity or demand charges (irrespective of the designation assigned to such transaction) when such energy is purchased on an economic dispatch basis, this encompasses energy being purchased to substitute for Company's own higher cost energy,

(c) The actual identifiable fossil and nuclear fuel costs associated with energy purchased for reasons other than identified in (b) above,

(d) The cost of steam from other sources used in the generation of electricity at the Company's generating stations,

(e) The cost of the Released Energy Credit paid to Customer(s) for avoided energy purchases under the Rider for Released Energy,

(f) The cost of the Buyback Energy Credit paid to Customer(s) for avoided energy purchases under the Rider for Voluntary Energy Buyback,

(g) Fuel and purchased energy expenses incurred by the Company over the duration of any Commission approved contract, as provided for by Minnesota Statutes, Section 216B.1645, to satisfy the renewable energy obligations set forth in Minnesota Statutes, Section 216B.1691 excluding the cost of fuel and purchased energy related to meeting the Solar Energy Standard,

(h) All MISO costs net of revenues allowed to flow through the FPE Adjustment by Commission's December 20, 2006 Order in Docket No. E-015/M-05-277, excluding the MISO Day 2 costs that are recovered under provision (b) of the FPE Rider, and

(i) The cost of the purchase of SO_2 allowances,

~~(i)~~(j) The Time of Generation Adjustment as calculated in the Rider for Solar Energy Adjustment

Approved by: Marcia A. Podratz
Marcia A. Podratz
Director - Rates

RIDER FOR FUEL AND PURCHASED ENERGY ADJUSTMENT

And **less**

~~(j)~~(k) Revenues from the sale of SO_2 allowances,
~~(k)~~(l) The cost of fossil and nuclear fuel and the cost of steam from other sources recovered through inter-system sales including the fuel and steam costs related to economy energy sales and other energy sold on an economic dispatch basis and
~~(l)~~(m) Net revenues from the sale of environmental attributes from any Commission approved contract.

The Kilowatt-Hour Sales shall be Company's total kilowatt-hour Sales of Electricity, excluding inter-system sales referred to in (~~k~~l) above and solar energy production and purchases referred to in (g) above; all for the first two of the preceding three months.

MINNESOTA POWER **SECTION** V **PAGE NO.** 50.2

ELECTRIC RATE BOOK - VOLUME I **REVISION** 2~~10~~

RIDER FOR FUEL AND PURCHASED ENERGY ADJUSTMENT

CLASS COST FACTORS

A separate Class Cost Factor shall be applied to calculate the Base Cost of Energy and FPE Adjustment for each Rate Class.

Rate Class	Class Cost Factor
Residential	1.07076
General Service	1.07093
Large Light & Power	1.00424
Large Power	0.97769
Municipal Pumping	0.98103
Lighting	0.74029

BASE COST OF ENERGY

The System Average Base Cost of Energy is 1.018¢/kWh. The class-specific Base Cost of Energy for each rate class is obtained by multiplying 1.018¢/kWh by the applicable Class Cost Factor.

Rate Class	Base Cost of Energy
Residential	1.090¢/kWh
General Service	1.090¢/kWh
Large Light and Power	1.022¢/kWh
Large Power	0.995¢/kWh
Municipal Pumping	0.999¢/kWh
Lighting	0.754¢/kWh

FUEL AND PURCHASED ENERGY ADJUSTMENT

The FPE Adjustment for each rate class shall be determined by multiplying the System Average FPE Adjustment by the applicable Class Cost Factor.

RIDER FOR FUEL AND PURCHASED ENERGY ADJUSTMENT

FUEL AND PURCHASED ENERGY ADJUSTMENT

Applicable to electric service under all Company's Retail Rate Schedules except Competitive Rate Schedules Rate Codes 73 and 79 and Erie Mine Site Service Schedule - Rate Code 72.

There shall be added to or deducted from the monthly bill an amount per kilowatt-hour determined as the amount by which the Fuel and Purchased Energy Costs divided by the actual Kilowatt-Hour Sales is greater than or less than the Base Cost of Energy as specified below.

The System Average Fuel and Purchased Energy (FPE) Cost shall be the FPE Cost divided by the Kilowatt-Hour Sales. The System Average FPE Adjustment shall be the System Average FPE Cost less the System Average Base Cost of Energy. The applicable FPE Adjustment will be included monthly on each customer's bill according to customer's rate class.

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The Fuel and Purchased Energy Cost shall be the **sum** of the following during the first two of the preceding three months:

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(d) The cost of steam from other sources used in the generation of electricity at the Company's generating stations,

(e) The cost of the Released Energy Credit paid to Customer(s) for avoided energy purchases under the Rider for Released Energy,

(f) The cost of the Buyback Energy Credit paid to Customer(s) for avoided energy purchases under the Rider for Voluntary Energy Buyback,

(g) Fuel and purchased energy expenses incurred by the Company over the duration of any Commission approved contract, as provided for by Minnesota Statutes, Section 216B.1645, to satisfy the renewable energy obligations set forth in Minnesota Statutes, Section 216B.1691 excluding the cost of fuel and purchased energy related to meeting the Solar Energy Standard,

(h) All MISO costs net of revenues allowed to flow through the FPE Adjustment by Commission's December 20, 2006 Order in Docket No. E-015/M-05-277, excluding the MISO Day 2 costs that are recovered under provision (b) of the FPE Rider, and

(i) The cost of the purchase of SO_2 allowances,

(j) The Time of Generation Adjustment as calculated in the Rider for Solar Energy Adjustment

Approved by: Marcia A. Podratz
Marcia A. Podratz
Director - Rates

RIDER FOR FUEL AND PURCHASED ENERGY ADJUSTMENT

And **less**

(k) Revenues from the sale of SO_2 allowances,
(l) The cost of fossil and nuclear fuel and the cost of steam from other sources recovered through inter-system sales including the fuel and steam costs related to economy energy sales and other energy sold on an economic dispatch basis and
(m) Net revenues from the sale of environmental attributes from any Commission approved contract.

The Kilowatt-Hour Sales shall be Company's total kilowatt-hour Sales of Electricity, excluding inter-system sales referred to in (l) above and solar energy production and purchases referred to in (g) above; all for the first two of the preceding three months.

RIDER FOR FUEL AND PURCHASED ENERGY ADJUSTMENT

CLASS COST FACTORS

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Rate Class	Base Cost of Energy
Residential	1.090¢/kWh
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Large Power	0.995¢/kWh
Municipal Pumping	0.999¢/kWh
Lighting	0.754¢/kWh

FUEL AND PURCHASED ENERGY ADJUSTMENT

The FPE Adjustment for each rate class shall be determined by multiplying the System Average FPE Adjustment by the applicable Class Cost Factor.

RIDER FOR SOLAR ENERGY ADJUSTMENT

APPLICATION

Applicable to electric service under all Company's Retail Rate Schedules except Competitive Rate Schedules Rate Codes 73 and 79 and Erie Mine Service Schedule – Rate Code 72. This Rider shall be applicable to customers who are not exempt from Solar Energy Standard obligations under Minnesota Statutes, Section 216B.1691, subd. 2(f), hereby defined as Solar-Paying Customers.

SOLAR ENERGY ADJUSTMENT

The Solar Energy Adjustment (SEA) shall be added to or deducted from each Solar-Paying Customer's monthly bill in an amount per kilowatt-hour determined as described below.

The SEA shall be calculated each month using data for the first two of the preceding three months as follows:

(a) Cost of solar energy purchased,
(b) Plus a credit for fuel and purchased energy costs included in the Rider for Fuel and Purchased Energy Adjustment (FPE Rider). The credit is an adjustment for cost already collected through the FPE Rider, including the Time of Generation Adjustment (TOGA). This credit is determined by multiplying the solar energy generation by the TOGA-adjusted FPE Adjustment (e) and adding the TOGA (d) as defined below.

Total of (a) and (b) shall be divided by the total kilowatt-hour sales for Solar-Paying Customers for the first two of the preceding three months.

TIME OF GENERATION ADJUSTMENT

The TOGA shall quantify the value of the time of generation for solar energy in order to compensate Solar-Paying Customers based on the time the solar energy is produced. The TOGA shall be added to the FPE cost and the resulting TOGA-adjusted FPE Adjustment shall be calculated in the FPE Rider as follows and applied to all customer energy usage:

(c) Calculate the FPE Adjustment without solar ($/MWh) by dividing the FPE costs excluding solar costs ($) by the non-solar energy generation (MWh);

Approved by: Marcia A. Podratz
Marcia A. Podratz
Director - Rates

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(d) Calculate the TOGA by multiplying the TOGA Factor as determined below by the solar energy generation and by the FPE Adjustment without solar;
(e) Calculate the TOGA-adjusted FPE Adjustment by adding the TOGA to the FPE costs excluding solar costs and dividing this sum by non-solar energy generation.

TIME OF GENERATION ADJUSTMENT FACTOR

The TOGA Factor shall be determined as follows:

(f) Calculate the simple average of hourly projected avoided energy cost ($/MWh) for the first two of the preceding three months as set out in Minn. Statute § 216B.164, subd. 3(b);
(g) Calculate the total hourly solar energy generation (MWh) for the first two of the preceding three months;
(h) Calculate the weighted average solar generation cost by multiplying each hourly projected avoided energy cost ($/MWh) by the associated solar energy generation amount (MWh) and then summing the total for the month ($);
(i) Calculate the weighted average solar energy generation cost ($/MWh) by dividing (h) by (g);
(j) Calculate the TOGA Factor by dividing (i) by (f) and subtracting 1.

STATE OF MINNESOTA	)	AFFIDAVIT OF SERVICE VIA
	) ss	ELECTRONIC FILING
COUNTY OF ST. LOUIS	)	

Susan Romans of the City of Duluth, County of St. Louis, State of Minnesota, says that on the **25th** day of **April, 2016**, she served Minnesota Power's Compliance Filng in Docket No. E015/M-15-773 on the Minnesota Public Utilities Commission and the Office of Energy Security via electronic filing. The persons on the attached service list were served as requested.

Susan Romans

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