13-474

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MINNESOTA PUBLIC
UTILITIES COMMISSION

April 3, 2014

Dr. Burl Haar, Executive Secretary
Minnesota Public Utilities Commission
121 7th Place East, Suite 350
Saint Paul, MN 55101-2147

Re: In the Matter of North Dakota Pipeline Company LLC,
MPUC Docket #13-474 and #13-473

Dear Dr. Haar:

Please accept our attached North Dakota Pipeline Company (NDPC) Sandpiper Pipeline Project comments. The Carlton County Land Stewards is a grassroots group of families, farmers, landowners, and individuals that oppose the creation of a new pipeline right of way (ROW) corridor in Northern Minnesota for the proposed Sandpiper Pipeline Project. The new hazardous liquid pipeline could completely disrupt some of the most productive farm and forestlands in Carlton County and cross virgin wetlands and waterways. The pipeline could invade our community and potentially destroy the delicate balance of the surrounding ecosystem and negatively affecting the socio-economics of the area; in particular the vibrant organic sustainable farming businesses in eastern Carlton County. It could risk future economic growth of sustainable farming in our area.

We commend our Commissioners for their forward visions and NDPC for their willingness to propose a more environmentally and socio-economically sound Preferred Route through eastern Carlton County. The revised Preferred Route submitted in January 2014 is a significant improvement. **We urge the PUC to <u>dismiss</u> the originally proposed Preferred Route now referred to as the Carlton County Route Alternative.**

The majority of the revised Preferred Route in eastern Carlton County is now proposed to follow existing ROWs in accordance with the State's non-proliferation principles. Eastern Carlton County has numerous existing ROWs crossing the area (see exhibit 1 under separate cover from Loretta Cartner). There is no justifiable reason why a pipeline would need to be routed through 14.7 miles of greenfield as proposed in the Carlton County Route Alternative. **We believe the Public Utilities Commission should seriously consider permitting the proposed pipeline along the Northern Route Alternative that follows Enbridge's existing Mainline hazardous liquid pipeline corridor. We ask the PUC to require the pipeline route to follow existing ROWs.**

Our overall impression of the project Environmental Information Report (EIR) is that it is a good start but it lacks details and is not clear as to what impacts may occur. Consequently, project impact mitigation measures are limited and need to be further developed to address additional impacts not examined or disclosed. We ask that the U.S. Department of State, June 5, 2009, Final Environmental Impact Statement and Executive Summary for the Presidential Permit application for Line 67 (Alberta Clipper) be incorporated by reference into our comments. We request that these documents be used as an example of the type of details that should be included in the Sandpiper project environmental analysis. Many issues and environmental effects should be similar and much of the same mitigation would apply and should be included in the project permit. We are attaching electronic versions of the main parts of these documents for your convenience (see exhibit 2 under separate cover from Loretta Cartner).

Since the EIR is limited in scope, it is difficult to fully understand what impacts can be expected and without that detail it has been very difficult to develop alternatives to submit during this public comment period for the route application. We ask that the EIR be improved and offered back to the public for comments and alternatives.

Thank you for this opportunity to voice our comments and concerns relating to the project. We believe cooperation between all parties will result in a more socio-economic and environmentally sound permit.

Sincerely,

s/s Carlton County Land Stewards

Carlton County Land Stewards

cc: Larry Hartman, Minnesota Dept. of Commerce

April 2, 2014

Dr. Burl Haar, Executive Secretary
Minnesota Public Utilities Commission
121 – 7th Place East, Suite 350
St. Paul, MN 55101-2147

RE: PUC Docket Number PL-6668/PPL-13-474

Dear Mr. Haar:

The W.J. McCabe Chapter of the Izaak Walton League supports this submittal on behalf of the Carlton County Land Stewards. McCabe Chapter's interest- in this matter are covered in EIR chapter 2 for the Route Selection and Alternative Analysis.

McCabe Chapter wants it to be clear, however, that the other comment chapters and paragraphs included in this submission by the Carlton County Land Stewards should not be considered opinions that conflict with the McCabe Chapter Izaak Walton League. McCabe Chapter Izaak Walton League is simply emphasizing the projects impacts on subjects that deal with the Izaak Walton League core mission.

This submittal approved by the W.J. McCabe Chapter Board of Directors for April 2, 2014.

Sincerely,

Rich Staffon

Rich Staffon, Chapter President

Comments on the Sandpiper Pipeline Proposal
MN Environmental Information Report

Introduction – 1.0

Routing Permit Docket No. PL-6668/PPL-13-474
Certificate of Need Docket No. PL-6668/CN/13-473

These comments are provided by the Carlton County Land Stewards (CCLS).

1.1 Project Description and Need

In para. 2 it says "The project purpose ... is to meet the increased demands of refineries and markets in the Midwest and East Coast." All Minnesota refineries, and the Superior WI refinery, are already at capacity and have no need for additional crude. According to the "Information Brief from the MN House of Representatives", dated June 2013, "Minnesota's refineries cannot absorb additional crude supplies at this time." And in a newspaper article, written by Russell Gold and Nicole Freidman for the Wall Street Journal and reported in the business section of the Minneapolis Star Tribune (Dec. 8th, 2013), titled "An Oil Glut Forms in the U.S. Gulf", it states "The glut reflects surging output from West Texas and North Dakota..." The glut is actually depressing the price of crude, and they say, "experts believe a nationwide oil glut is coming". Yet today, Enbridge is pursuing permits to expand pumping capacity in Line 67 (increasing from 450,000 bpd - to 800,000-880,000 bpd), is pursuing permits for the proposed Sandpiper pipeline (initially 375,000 bpd – eventually to 711,000 bpd), and announced replacement and expansion of Line 3 (increasing from 390,000 bpd - to 760,000 bpd). That is a proposed increase of 1,431,000 bpd or 170% over current capacity. It may imply that this pipeline is in the "public interest" and negate trying to challenge the pipeline and the use of eminent domain by a foreign for profit company. According to Table 7853.0240-C.1, 95% pumping capacity appears to be going out of state and region. Refineries Served Directly or Indirectly by Enbridge Systems". In NDPC Sandpiper CN application, MN and Wisconsin refineries have only 5% of the total refining capacities of other refineries throughout the US and Canada that this pipeline could serve. Most of this oil will not be going to MN or Wisconsin and is not in the "public interest" for MN and its' citizens. In fact, this oil appears to not be needed by MN or Wisconsin due to limited refining capacity, and in reality it is needed out of the region to destinations such as Illinois, Ohio, Pennsylvania, Canada, Oklahoma, Kansas, and Texas. If NDPC says this oil is destined to MN and Wisconsin, then they are shifting the oil from their other pipelines out of MN and Wisconsin and replacing it with oil from this project pipeline thereby trying to mask where this oil really is needed.

Calumet Refinery in Superior, Wisconsin, located at the end of the proposed Sandpiper Pipeline, has already been reporting over-capacity since early 2013 as justification to pursue permits to ship crude oil cross the Great Lakes. NDPC's proposal to create a new

southerly corridor in Minnesota is being done simply to justify expansion of their capacity beyond the Midwest, either through pipelines to the Gulf or east coast, or by barge through the Great Lakes. NDPC's statement in 2.1 that "residents of Minnesota and neighboring states will be negatively impacted without the capacity expansion afforded by this Project" is inconsistent not only with the findings of the Legislature, independent observers of the business community, and actions of NDPC's partner Calumet Refinery, but also inconsistent with any reasonable evaluation of the currently proposed expansions. The demand to ship more oil is a result of an extraction decision. It does not constitute a public need of Minnesotans, especially if demand for petroleum products continues to decline in Minnesota. ***The statement indicating that there is a legitimate demand is unsubstantiated, and therefore the need for this line must also be viewed as unsubstantiated, and approval to proceed with this project must be denied.***

1. On pg. 5, 1st para. – "The project will generally be co-located with existing pipeline or third-party rights-of-way..." There is no detail provided in the report about discussion with these third-parties, no discussion about the compatibility of their uses, and whether they are agreeable to the merging of the rights-of-way (ROW). ***The PUC should request that the DOC study this alternative and file a report. Till further details answering questions about possibly incompatible third-party implications are satisfactorily addressed in this document, the PUC must withhold the final decision on this routing.*** In the same para., there is also objection to the analysis that the line "crosses minimal Greenfield parcels for approximately 158 miles..." By most standards destroying 158 miles of farmland, woods and peoples properties are anything but **minimal**. ***To attempt to marginalize the impact to the environment and people's lives is unprofessional. The PUC must view this as a veiled attempt to hide the real impact of the creation of an all new ROW corridor, and they must require the applicant to utilize their existing ROW, the Northern Route Alternative.***
2. On pg. 6, 1st line – "This 120-foot-wide construction right-of-way will allow... safe operation of construction equipment. The project will use a 95 foot-wide construction right-of-way in wetland areas." ***If it is safe to use a 95 foot ROW in wetlands, why not the same standard for uplands? This would greatly reduce the overall footprint of the Project and prevent disturbance to a substantial number of acres.***

1.2.1 Additional Temporary Workspaces

1. In the 1st para. – "Additional temporary workspace will be included ... For example, ... wetlands..." If they are saying they are narrowing the ROW in wetlands to 95 feet, why are they also saying they will then need to widen it for temporary workspace? How often will this happen, and how wide will this additional workspace

be. Under what circumstances, and specifically where are they going to need this extra workspace? When this happens, will the landowner receive extra compensation? Is the location and specifics of this extra workspace a negotiable item for the landowner? ***The document lacks sufficient detail to address these questions, therefore the PUC must reject this statement until these issues have been documented.***

2. On pg. 11, 2nd para. – Why is hydrostatic testing done after backfilling, and not before the backfill is in place? This would obviously obscure small leaks, inhibit repairs, and add costs to the inspection and repair process during this step. These repairs need attention before the line goes into service, not weeks, months, or years later. ***Regulators should require hydrostatic testing prior to backfilling so lines can be visually inspected and repaired, prior to being covered. If there is question about damage to the pipe during backfilling, the pipe should be hydrostatically tested a second time.***

3. On pg. 13, para. 2 – "...NDPC will retain Environmental Inspectors ("EI") to verify environmental protection measures..." So, who is paying for this service, and is there independent, third-party verification? If the Applicant is paying the inspectors, then it would appears the fox is guarding the henhouse. ***Regulators should require independent, third-party verification of all environmental standards, and act as watch-dogs over this project from start to finish.***

Comments on the Sandpiper Pipeline Proposal
MN Environmental Information Report

Route Selection and Alternative Analysis 2.0

Routing Permit Docket No. PL-6668/PPL-13-474
Certificate of Need Docket No. PL-6668/CN/13-473

These comments are provided by the Carlton County Land Stewards (CCLS).

Northern Alternative Route

1. It appears the Northern Route was largely rejected because NDPC is unable to use eminent domain on tribal, federal, state and county lands to acquire their ROW, in particular citing an inability on Leech Lake and Fond du Lac Indian Reservations lands, saying "As project planning progressed, it became apparent NDPC would not have been able to assemble a continuous right-of-way (ROW) for a significant portion of the Northern Route." This explanation lacks detail. It is unclear from the document if NDPC ever had any recent formal contact or negotiations with the tribal governments located on the Northern Route. NDPC needs to contact and return to the bargaining table with the tribal governments to reach a fair settlement. NDPC's apparent unwillingness to bargain in good faith and pay fair compensation should not be a justification for ignoring the principle of non-proliferation and rejecting the best possible route. ***Therefore the PUC must reject this premise and require NDPC to return to the negotiation table with the tribal governments to reach an equitable financial solution that will then allow construction of the Northern Route. If NDPC and the tribal governments cannot reach an agreement on their own, we suggest that the PUC should ask that a State Mediator be brought in to facilitate an agreement, possibly through binding arbitration or similar mechanism. The NDPC "preferred route" will pass through and impact the White Earth Reservation, so all of the alternatives will have direct impacts on the native communities. However, an entirely new corridor will have far greater impacts than adding one pipe to an already existing ROW.***
2. After citing several advantages to the Northern Route, all of which should be weighed and thoughtfully considered against any negative impacts, NDPC lists several disadvantages. One, the route crosses 7.8 miles of additional wetlands. In shedding some light on this, the wetlands along the Northern Route are already heavily impacted by the existence of six other Enbridge industrial pipeline developments, and further impacts as a result of another pipeline installation, done with due consideration to safety and thoughtful protection of the environment, will have far less overall impact on the environment than putting that same pipeline in the comparatively pristine environment of the "preferred route". One additional pipe in the present corridor will have far fewer social and environment consequences than

the proliferation of an all new ROW. ***Therefore, the PUC must reject this argument by NDPC that this project will negatively impact the wetlands along the Northern Route to a greater extent than the "preferred route", and the PUC must require NDPC to utilize their existing Mainline ROW, the Northern Route Alternative.***

3. NDPC also says the Northern route would "cross approximately 34 miles of Chippewa National Forest and 12 more miles of state forest land..." Since the northern route already crosses these same parcels of land, it will have far less impact than the creation of an all new ROW. In addition, since a "public service corporation" is building the pipeline, it would seem reasonable that publicly owned lands should bare the greatest burden for the ROW. The PUC should not permit the Applicant to "Gerrymander" to avoid public lands, when the Project is for use by a public service corporation. This would allow the proliferation of a new corridor that is 44 miles longer than the existing ROW. NDPC should be required to utilize public lands as much as possible, thus reducing the burden placed on private landowners for the construction of an industrial, hazardous materials corridor, all for the benefit of a for-profit "public service corporation". This is particularly burdensome for private landowners, who unlike the public sector which receives ongoing financial payments for the leased ROW, private landowners receive **no** ongoing due compensation for their perpetual personal sacrifice. The applicant is demanding these private landowners assume economic, financial, and environmental risks without receiving ongoing financial compensation. ***Therefore, the PUC must reject the overt attempt by NDPC to avoid public lands in their routing, and require NDPC to utilize their existing pipeline ROW, the Northern Route, for this proposed project.***

4. Placing the right-of-way on public lands also allows increased financial benefits to the public through lease fees to the applicant, and in return the public receives additional benefits by receiving increased scrutiny and inspection of the project during the planning and construction phases, scrutiny laymen seldom have the expertise or financial resources to acquire. ***The PUC should require NDPC to utilize the Northern Route, so that the public receives financial compensation through leasing dollars to the federal, state, county and tribal governments, where the route crosses their lands.***

5. At the bottom of page 2-10 it says "Although the Northern Route would have met the project objective, NDPC determined that the alternative was infeasible because it (was) unable to assemble the requisite ROW easement and would have introduced additional environmental impacts to federal and tribal lands that the preferred route avoids." In other words, the route works, but if they move the route they will not have to deal with tribal, federal and state statutory regulations and assume ongoing financial commitments. And, if they use the "preferred route" not only do they avoid

all these regulations and minimize ongoing financial payments to government units, on private lands they make a minimal one-time payment for land costs to the private landowners, and/or use eminent domain to take the private lands (which can't be done on public lands) to obtain their ROW as cheaply as possible, and with less bureaucratic oversight. ***The PUC needs to identify the Northern Route as the best choice for the route, since it has met "project objectives" and has been feasible six times since the original line was installed in 1949, including the recently constructed Line 67 (Alberta Clipper). We submit this route to the PUC for consideration (see attached map - Exhibit 3). Furthermore, the Applicant has shown no documentation that there has been any significant change in their ability to acquire the necessary easements along the route. The PUC must reject NDPC's claims that this route will result in greater impacts to Federal and tribal lands, as well as other ownership along the existing Northern Route, and see that proliferation of a new route will inject far greater harm to the environmental and social fabric of northern MN.***

6. In the last paragraph, NDPC mentions construction constraints associated with the Northern Route. These are not worthy of routing concerns. Enbridge says they will have difficulty installing a pipeline in the existing ROW and it's not safe. They have already safely installed 6 lines in their Mainline, the Northern Route, including the recently installed Line 67. Each additional pipeline has had to deviate at times from being immediately adjacent to the previously installed pipeline, but that does not substantiate the need for an entirely new corridor. Furthermore, NDPC has not provided any documentation of the construction constraints along with number and location of these. In a recent Duluth News Tribune article dated March 5, 2014, Enbridge's spokeswoman indicated from Clearbrook, MN to WI that Line 3 "could follow either the Alberta Clipper or old Line 3 route to Superior or move south and follow the route where Enbridge wants to build the new Sandpiper line." Thus, even Enbridge recognizes there is available space in the Mainline (Northern Route) for another pipeline. ***The PUC should reject the claim by NDPC that there are too many construction and safety problems with installing another line in their Mainline (Northern Route), and require NDPC to install the proposed line in their Mainline (Northern Route).***

7. In reviewing the comparison data in Table 2.3.3-1 (or by viewing the map in Figure 2.3.1 on pg. 2-13) the Northern Route is shorter (44 miles); utilizes more existing ROW (12 miles); impacts far fewer miles of Greenfields (55); fewer NWI wetland sites (62); fewer miles with highly erodible soils (57); and fewer miles of prime farm soils (16). It also provides better access (19 more road access points), and more rail access points (10). Using some basic math calculates the Northern Route impacts about 623 fewer acres, or almost one square mile less of undisturbed ground. These are significant improvements over the preferred route. ***The PUC must***

recognize the important environmental positives associated with the Northern Route alternative, reject the possible proliferation of pipeline corridors on our landscape, including the associated social, financial, and environmental damages, and require NDPC to build this proposed pipeline on their existing ROW.

8. In reviewing Table 2.3.3-1, there is no data on the landowner impacts. As 75.5% of the miles in the Southern Preferred route crosses private lands, this is an important element to the equation. ***The PUC should direct NDPC to add private landowner impacts to this table, by providing data tabulating and comparing the number of individual landowners impacted by each route, so an accurate comparison can be made.***

9. Our overall impression of the project Environmental Information Report (EIR) is that it is a good start but it lacks details and is not clear as to what impacts may occur. Consequently, project impact mitigation measures are limited and need to be further developed to address additional impacts not examined or disclosed. ***We ask that the U.S. Department of State, June 5, 2009, Final Environmental Impact Statement and Executive Summary for the Presidential Permit application for Line 67 (Alberta Clipper) be incorporated by reference into our comments. We request that these documents be used as an example of the type of details that should be included in the Sandpiper project environmental analysis.*** Many issues and environmental effects should be similar and much of the same mitigation would apply and should be included in the project permit. We are sending under separate cover, as exhibit 2 from Loretta Cartner, electronic versions of the main parts of the documents for your convenience. In addition, it would seem likely that most of the resources, impacts, and mitigation would directly apply to the Northern Route Alternative.

Aitkin County Powerline Alternative

1. In reporting on the Aitkin County Powerline Alternative, it fails to point out that it is one possible alternative to avoiding the State of Minnesota - Kennecott mineral lease sites in Aitkin and Carlton counties. Utilizing this route would circumvent this State lease site, and avoid conflict between these two potential users. ***The PUC must carefully weigh the conflicts associated with the preferred route, as it crosses the State mineral lease site purchased years ago by Kennecott, and thoughtfully consider the Aitkin County Powerline Alternative as a viable option that would eliminate this user conflict.***

2. The Aitkin County Powerline Alternative represents a vast improvement over the preferred route, when comparing ROW development impacts; requiring 50 miles fewer new ROW construction miles than the preferred route; it impacts zero (0) miles of Greenfield using the powerline, as opposed to 46 new miles of destroyed

Greenfield under the preferred route; there are almost 16 miles less of highly erodible soils with this route; there are 3 miles fewer disturbed prime farmland; and there are fewer road crossings. All this greatly reduces proliferation and impacts across the landscape. However, table 2.3.3-2 is deceptive in that it only compares the difference in these two line segments, beginning at MP 515.5 and ending at 565.3 where they meet at a point on the preferred alternative. The table fails to provide a full comparison of the routes as a whole, and fails to display most of the impacts along the entirety of the preferred alternative. ***Using this report, it would be tedious and difficult for the public to accurately compile the data for the entire length of this proposed route. Therefore the PUC must require NDPC to fully display the environmental comparisons in table form for each alternative over its entire length, from one end of the project in MN to the other, and discuss all of the cumulative impacts for the entire length, not just the segment's impacts. This data needs to be provided in this report and the public must be given ample opportunity to review the data and provide informed public comment.***

3. In reviewing Table 2.3.3-1, there is no data on the human impacts. As 75.5% of the miles in the Southern Preferred route crosses private lands, this is an important element to the equation. ***The PUC should direct NDPC to add private landowner impacts to this table, by providing data tabulating and comparing the number of individual landowners impacted by each route, so an accurate comparison can be made.***

Allete Powerline Alternative

1. The report says "The Allete Powerline Route Alternative would have met the project objective...", but NDPC believes there may be additional construction and safety risks. Both routes have wetlands to cross, 25.7 on Allete and 22.2 on preferred, a mileage difference of 3.5 miles, which isn't so great as to be a significant difference in construction workability in the winter. Loggers across the state deal successfully with wetland access and harvesting operations each winter, and consider it just part of the job. ***The PUC must recognize that northern Minnesota has vast areas of wetlands, and any linear project of this magnitude is going to have to cross these wetlands, and it will require winter work in the swamps to get the job done. This is not a reason to reject a project that meets the project objective. The PUC should thoughtfully consider the Allete Powerline alternative and reject NDPC's dismissal of this alternative.***
2. The accessibility issue seems to be a case where NDPC wants to have its cake, and to eat it, too. When the proposed route crosses the public transportation system, they look at it as a negative, something to avoid because of its impact on residences, and because of the extra cost involved in crossing roads and rail lines. When

access is limited, they say the access is poor for construction supplies, equipment, and emergency response personnel in case there's an accident. They need to make a choice, call it a benefit or a detriment, but be consistent. ***The PUC should disregard NDPC's claims that access is a defining issue for route selection, since Applicant selectively chooses when this becomes an issue. Both limited access and sites with good to great access (too many roads, ie higher construction costs) affect business costs equally.***

3. In reviewing Table 2.3.3-3, there is no data on the human impacts. As 75.5% of the miles in the Southern Preferred route crosses private lands, this is an important element to the equation. ***The PUC should direct NDPC to add private landowner impacts to this table, by providing data tabulating and comparing the number of individual landowners impacted by each route, so an accurate comparison can be made.***

Aitkin County Soo Line Route

1. Since the NDPC proposal only discusses one (1) pipeline in this ROW, the fact that "... in addition to easement width, only one side of the right-of-way would have been usable, and as such, the trail in many areas would have been permanently impacted via grading and/or cutting down of the trail" should have no bearing on its serviceability for this project, and certainly is not grounds for rejecting the alternative. In fact, there would have been little or no lasting negative impact on recreational users once final grading of the surface is completed. Burying the pipeline directly beneath the old railroad bed in the center of the ROW would be an ideal fit. There would be little or no wetland impact, construction could take place virtually any season of the year with minimal winter construction issues, and it's a highly compatible use for this old industrial site. If this ROW could accommodate a railroad, it can certainly accommodate a pipeline. ***We offer the Soo Line (see attached Exhibit 4) as an alternative to the PUC where the Sandpiper pipeline project should utilize the entire Soo Line Grade, that could nearly encompass this project from start to finish through Minnesota. The PUC should request that the DOC evaluate utilizing all or significant portions of the Soo Line Grade for this project, and add it to the routes considered viable for this pipeline.***
2. The Soo Line ROW is 100 ft wide, more than enough for a single pipeline. But in this document NDPC states "... in addition to easement width, only one side of the right-of-way would have been usable..." indicating that NDPC believes that this ROW will eventually be used by more than one pipeline. If that is the case, then the cumulative impact of more than one pipeline needs to be evaluated at this time. ***In fact, Enbridge announced on March 5th, 2014 that they could re-construct Line 3 on the proposed Sandpiper Route. It is clear that Enbridge has plans beyond just one pipeline. Therefore, the PUC needs to order NDPC to begin this***

process over, and incorporate all of their development plans for multiple projects within the same construction horizon. Thus, the PUC must order a full EIS or GEIS, to include the cumulative impacts of all its projects in the evaluation process.

3. If the present 100 ft. ROW of the Soo Line is not adequate, then NDPC can acquire a temporary easement of 20 feet alongside the Soo Line Grade during the construction phase. That would still be far fewer acres impacted than an all new 120 foot ROW. ***For the impacted landowners along the Soo Line, this is about one-sixth the impact landowners would experience along most of the other alternate routes, and it would only be for a temporary workspace, with no permanent easement required from these landowners. The remainder of the ROW on the Soo Line Grade is in public ownership, so no permanent acquisition of lands would be necessary. A lease of the Soo Line is all that's needed to acquire this space. Since this proposal is both environmentally superior, and has very limited human impact, the PUC should consider this as the second best construction alternative, behind only the Northern Route.***
4. ***Use of the Soo Line, a former industrial corridor, for this pipeline project will have far fewer environmental and socio-economic impacts than any of the other alternatives, except the Northern Route where there is already an existing pipeline corridor.***
5. An obvious advantage of the Soo Line for NDPC and the nearby public, will be the free, nearly constant surveillance of its pipeline, as recreational users travel the length of the corridor throughout the four seasons.
6. The comments by NDPC about trail closures for a season or two is not nearly as detrimental as having an industrial site imposed upon many hundreds of landowners in perpetuity. ***For recreational users it will be nothing more than a temporary nuisance. For landowners with a new ROW through their land, it's an impact that lasts a lifetime. Those aren't equally balanced issues. In the end, recreation users would get a newly rebuilt, beautiful recreation trail and NDPC would have a new pipeline corridor.***
7. In reviewing Table 2.3.3-3, there is no data on the human impacts. As 75.5% of the miles in the Southern Preferred route crosses private lands, this is an important element to the equation. ***The PUC should direct NDPC to add private landowner impacts to this table, by providing data tabulating and comparing the number of individual landowners impacted by each route, so an accurate comparison can be made.***

The Carlton County Route Alternative pg 2-23 to 2-25

The original preferred route (what is now called the Carlton County Route Alternative and often referred to as the original Southern Route through eastern Carlton County) was

drafted by NDPC in the office using available technology and limited understanding of on-the-ground resources. Understandably, as the company met with landowners and the Carlton County Commissioners, they began to better understand the issues along the route; especially negative affects to sustainable farming, soils, watershed, large tracts of forest, and socio-economics of the area. NDPC consulted and worked closely with the Carlton County Commissioners to address specific socio-economic and environmental issues and concerns in eastern Carlton County. The new revised Preferred Route is a significant improvement, but more particularly the Northern Route Alternative does a much better job of utilizing existing rights-of-way than any route using the Carlton County Route Alternative, which was entirely made up of Greenfield. ***We believe the Carlton County Route Alternative must be dismissed by the PUC for numerous reasons including:***

1. According to the route selection criteria in MN Statute 7852.1900, Subpart 3, A., this route fails to meet consideration of "existing and planned future land use". The organic farms in that area are successful businesses that rely on healthy soils and a balanced surrounding environment. These farms supply the growing demand for sustainably grown foods in the Duluth region. The growth potential to this industry is favorable, and currently new farms are developing and existing farms are expanding. In the near and not too distant future, one could expect the land between these farms to be converted to organically grown produce. Based on one farmer's experience in the area, $25,000 per acre of crop value can be expected for these types of organic farms. If the Carlton County Route Alternative is dismissed, this would eliminate the destruction of the highest prime farmland soils for eastern Carlton County. In the near future, if 150 acres were added to grow organic produce, that is an increase of $3,750,00 a year in business. An increase of jobs could also be expected along with increased taxes paid.
2. According to the route selection criteria in MN Statute 7852.1900, Subpart 3, F. "use of existing rights-of-way and right-of-way sharing or paralleling", the Carlton County Route Alternative completely fails by having an additional 10.5 miles of Greenfield compared to the new Preferred Route. There is absolutely no reason to harm the landowners, environment and County by constructing a new ROW pipeline corridor through pristine forests, protected watersheds, prime farmland and citizen's private property. ***Eastern Carlton County has numerous viable existing ROW routes that could be utilized (see exhibit 1). Following existing ROWs in accordance with the State's non-proliferation principles should be followed.***

Proposed Project Route - aka Preferred Route Alternative

The preferred route has a number of disadvantages, as pointed out in the other alternative discussions above. When compared to the Applicants existing pipeline corridor from Clearbrook to Superior, the Project is 44 miles longer in length, and includes 50 miles additional Greenfield development. In fact, with the exception of the Carlton County Route

Alternative, which the Applicant later deemed to be less environmentally sound and had greater socio-economic impacts than their new Preferred Route Alternative, every other alternative studied showed that the Preferred route would have greater impact to Greenfields than any of those alternatives. These two factors alone should provide sufficient reason for this project alternative to be rejected, as it does not follow Minnesota's long-standing policy of non-proliferation, and because it is not environmentally sound, nor does it minimize the socio-economic impacts to private landowners along this proposed ROW. Furthermore, though the Applicant says the Preferred Route has nearly as many miles of co-location with other utilities as the existing route, this is a false comparison when viewing the differences in the types of impacts caused by non-pipeline utilities. Although powerline corridors and pipeline corridors may appear to be similar, they have significant differences that need to be considered. A powerline impacts the soil and water significantly less than a pipeline. Where a powerline augurs a 2-3 ft diameter hole in the ground for each pole placement, the pipeline must dig a trench 7+ft deep and at least 8-10 ft wide, continuously for hundreds of miles. Those levels of disruption are not equal. While powerlines can span across waterbodies without disturbing the bed of the waterbody, contributing very little to sedimentation of the water, pipelines must trench through waterbodies, which has significant impact on water quality and kills off aquatic organisms nearby. And while the use of powerline corridors is preferable to use of new Greenspace, it should not be viewed as comparable to that of a pipeline. ***To minimize environmental damage, this project should use an existing industrial pipeline corridor, either the Northern Route Alternative (the Applicants Mainline), the old railroad bed and corridor found at the Soo Line Grade, or one of many pipeline corridors already found on the Minnesota landscape.***

Landowners on power lines do not have to contend with the possibility of a leak that could make their land permanently toxic or contaminate their drinking water. On the other hand, power lines cause more problems with sightlines and visual pollution than buried pipelines. One must conclude that while ROW sharing is certainly preferable to Greenfield development, to be consistent with the principal of non-proliferation and the rationale behind it, pipelines should be routed alongside other pipelines - to the greatest extent possible. The applicant makes no distinction between different types of ROW sharing. This is unacceptable because there are clear differences in the environmental and socioeconomic impacts between different types of rights of way. ***The PUC and DOC should compel NDPC to provide detailed information on types of right of way shared by each route proposal and the differing impacts should be fully examined as part of their application. Furthermore, the PUC and DOC should request analysis from the Minnesota Department of Agriculture on the impacts expected from pipeline vs. power line development on agricultural land.***

In viewing the Preferred Route Alternative from the socio-economic viewpoint, the impact to private property owners is far greater than under the Northern Route Alternative. With almost 76% of the Preferred route on private land, this places a disproportionately high burden upon the tax-paying private sector. ***While the impacts to public lands need to be closely scrutinized and properly managed to create as little disturbance and impact as possible to our State's important natural resources, we feel that as a public service project, the public land base should shoulder the greatest proportion of the burden for this project, rather than focusing that impact largely on the private sector.***

In reading through the report, the Applicant has failed to provide evidence to their claim that they are unable to acquire easement for this Project along their existing ROW. Without this documentation, there is no way to make an informed decision on the validity of their claim. In attempting to establishment a new corridor, the Applicant would expose the citizens along the Preferred Route to additional hardship as additional new utilities are added to this ROW. Following the PEER vs. Minnesota Environmental Quality Council ruling *in 1978, it was recognized by the MN Supreme Court that "...the establishment of a new route today means that in the future, when the principle of non-proliferation is properly applied residents living along this newly established route may have to suffer the burden of additional powerline easements." The ruling also said "The destruction of protective environmental resources, however, is not noncompensable and injurious to all present and future residents of Minnesota.* ***Therefore the burden to prove that the Applicant has no other feasible alternative but to create a new ROW corridor, must be definitively shown to the DOC, PUC and the public, and that failure to do so means that the Applicant must utilize their pre-existing route which will minimize the impact of a new intrusion by limiting its effects to those who are already accustomed to living with the existing route.***

The No-Action Alternative

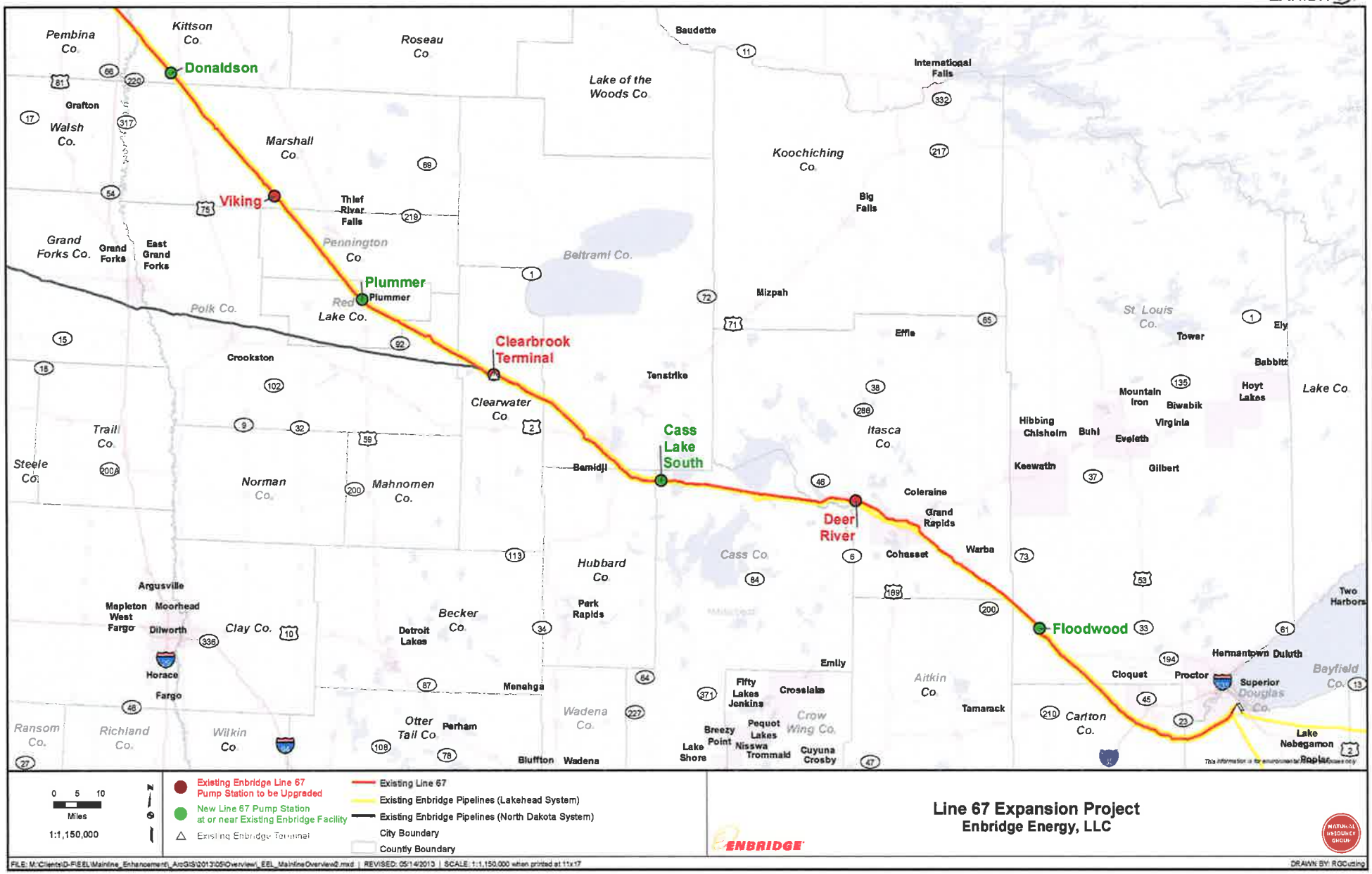
The no-action alternative was summarily rejected by NDPC as not meeting the project objective. According to the "Information Brief from the MN House of Representatives", dated June 2013, "Minnesota's refineries cannot absorb additional crude supplies at this time." And in a newspaper article, written by Russell Gold and Nicole Freidman for the Wall Street Journal and reported in the business section of the Minneapolis Star Tribune, entitled "An Oil Glut Forms in the U.S. Gulf", it states, "The glut reflects surging output from West Texas and North Dakota..." Yet, Enbridge is pursuing permits to expand pumping capacity in Line 67 (increasing from 450,000 bpd - to 800,000-880,000 bpd), is pursuing permits for the proposed Sandpiper pipeline (initially 375,000 bpd – eventually to 711,000 bpd), and announced replacement and expansion plans of Line 3 (increasing from 390,000 bpd - to 760,000 bpd). This will flood the Minnesota and Wisconsin markets with oil (a proposed increase of 1,431,000 bpd or 170% over current capacity). Calumet Refinery in Superior Wisconsin, located at the end of the proposed Sandpiper Pipeline, has already been

reporting over-capacity since early 2013, as justification to pursue permits to ship crude oil cross the Great Lakes. NDPC's proposal to create a new southerly corridor in Minnesota is being done simply to justify expansion of their capacity beyond the Midwest, either through pipelines to the Gulf or east coast, or by barge through the Great Lakes. NDPC's statement in 2.1 that "residents of Minnesota and neighboring states will be negatively impacted without the capacity expansion afforded by this Project" is inconsistent not only with the findings of the Legislature, independent observers of the business community, and actions of NDPC's partner Calumet Refinery, but also inconsistent with any reasonable evaluation of all these currently proposed expansions. ***Therefore, the No-Action alternative must be considered by the PUC as a viable option for Minnesota because there is adequate flexibility in existing lines in the Northern route to provide additional supply that will more than meet the needs of regional refiners.***

Summary (in descending preference)

- The PUC must recognize that the No-action Alternative is the best fit for the current circumstances, where local markets refiners are seriously overcapacity with crude oil. Expansions of other existing lines will more than meet our state's needs for additional oil for the foreseeable future.
- In light of the recent announcements by Enbridge touting all their expansion plans, the PUC must now request a full EIS to study the cumulative impacts of all these projects. Approval of this project must wait for completion, and review of the EIS findings before ruling on this proposed project.
- If after an EIS, the PUC and DOC believe this project is necessary, then the PUC must recognize that the existing Northern Route Alternative is the best route to available for this proposed pipeline, complying with the MN State Supreme Court verdict in the CAPX case (OAH docket No. 3-2500-21181-2 and PUC docket No. ET002/TL-09-1448) that further reinforced anti-proliferation requirements, and this route minimizes environmental and social impacts over all other alternatives. The PUC must tell the Applicant (NDPC) to enter into negotiations with the tribal governments to secure a route that follows this existing corridor.
- Only after thorough negotiations have been exhausted between NDPC and the tribal governments, including use of an independent State Mediator, then the PUC should look at the next best alternative.
- The PUC must recognize that selecting the old industrial ROW provided by the Soo Line Grade, in its entirety, is the second best available route alternative. If the NDPC and the tribal governments cannot reach a reasonable settlement, than the Soo Line Grade must be selected as the site for this proposed pipeline.
- If the PUC and DOC are unwilling to require use of the entire Soo Line Grade as we've proposed, then the PUC must choose either the Soo Line Alternative as submitted by NDPC, or the Allete Route also proposed by NDPC as an alternative.

EXHIBIT 3


Donaldson
Viking
Plummer
Clearbrook Terminal
Cass Lake South
Deer River
Floodwood
Pembina Co.
Kittson Co.
Roseau Co.
Lake of the Woods Co.
Baudette
International Falls
Grafton
Walsh Co.
Marshall Co.
Koochiching Co.
Thief River Falls
Big Falls
Grand Forks Co.
Grand Forks
East Grand Forks
Pennington Co.
Beltrami Co.
Mizpah
Polk Co.
Red Lake Co.
St Louis Co.
Effie
Tower
Ely
Babbitt
Crookston
Tenstrike
Clearwater Co.
Mountain Iron
Biwabik
Hoyt Lakes
Lake Co.
Hibbing
Chisholm
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Eveleth
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Trail Co.
Steele Co.
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Bemidji
Keewatin
Gilbert
Coleraine
Grand Rapids
Cass Co.
Cohasset
Warba
Hubbard Co.
Park Rapids
Argusville
Mapleton
West Fargo
Moorhead
Dilworth
Clay Co.
Becker Co.
Detroit Lakes
Two Harbors
Horace
Fargo
Menahga
Emily
Fifty Lakes
Jenkins
Crosslake
Aitkin Co.
Cloquet
Proctor
Hermantown
Duluth
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Bayfield Co.
Douglas Co.
Ransom Co.
Richland Co.
Wilkin Co.
Otter Tail Co.
Perham
Wadena Co.
Breezy Point
Pequot Lakes
Nisswa
Trommald
Crow Wing Co.
Tamarack
Carlton Co.
Lake Shore
Cuyuna
Crosby
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Poplar
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Existing Enbridge Line 67 Pump Station to be Upgraded
New Line 67 Pump Station at or near Existing Enbridge Facility
Existing Enbridge Terminal
Existing Line 67
Existing Enbridge Pipelines (Lakehead System)
Existing Enbridge Pipelines (North Dakota System)
City Boundary
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ENBRIDGE
Line 67 Expansion Project
Enbridge Energy, LLC
FILE: M:\Clients\D-F\EEL\Mainline_Enhancement_ArcGIS\2013\05\Overview_EEL_MainlineOverview2.mxd | REVISED: 05/14/2013 | SCALE: 1:1,150,000 when printed at 11x17
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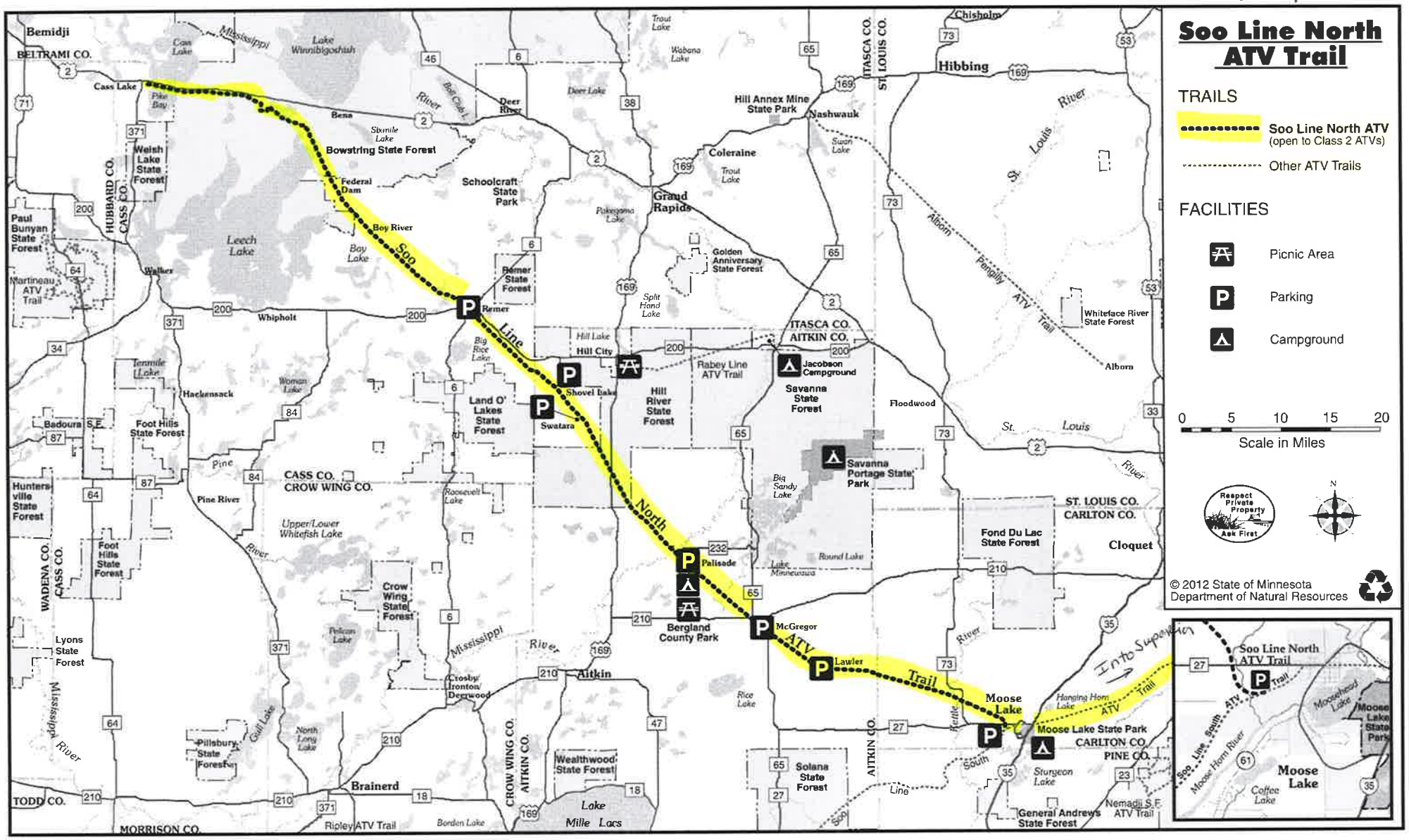
EXHIBIT 4


Soo Line North ATV Trail
TRAILS
Soo Line North ATV (open to Class 2 ATVs)
Other ATV Trails
FACILITIES
Picnic Area
Parking
Campground
0 5 10 15 20
Scale in Miles
Respect Private Property Ask First
N
© 2012 State of Minnesota Department of Natural Resources
Bemidji
BELTRAMI CO.
Cass Lake
Bena
Bowstring State Forest
Federal Dam
Boy River
Schoolcraft State Park
Grand Rapids
Coleraine
Hill Annex Mine State Park
Nashwauk
Hibbing
Chisholm
Whipholt
Remer
Hill City
Jacobson Campground
Savanna State Forest
Savanna Portage State Park
Floodwood
Palisade
Bergland County Park
McGregor
Lawler
Moose Lake
Moose Lake State Park
Aitkin
Brainerd
Cloquet
Fond Du Lac State Forest
Solana State Forest
Wealthwood State Forest
Crow Wing State Forest
Land O' Lakes State Forest
Hill River State Forest
Swatara
Shovel Lake
Soo Line North ATV Trail
Into Superior
Soo Line South ATV Trail
Moose Lake
Coffee Lake
Moosehorn Lake
Moose Lake State Park
Nemadji S.F. ATV Trail
General Andrews State Forest
Sturgeon Lake
Hanging Horn Lake
Rabey Line ATV Trail
Albora Pangilly ATV Trail
Whiteface River State Forest
Alborn
Paul Bunyan State Forest
Martineau ATV Trail
Hunters ville State Forest
Foot Hills State Forest
Lyons State Forest
Pillsbury State Forest
Ripley ATV Trail
Mille Lacs
Lake Winnibigoshish
Leech Lake
Upper/Lower Whitefish Lake
Big Sandy Lake
Round Lake
Lake Minnewaska
Rice Lake
Pelican Lake
Gull Lake
North Long Lake
Roosevelt Lake
Woman Lake
Tennile Lake
Pike Bay
Cass Lake
Deer Lake
Trout Lake
Wabana Lake
Swan Lake
Pokegama Lake
Split Hand Lake
Big Rice Lake
Hill Lake
Borden Lake
Stamile Lake
Bay Lake
Walker
Badoura S.F.
Hackensack
Pine River
Mississippi River
St. Louis River
Pine River
Kettle River
Boy River
Bass Lake
Deer River
Bass Creek
Golden Anniversary State Forest
Remer State Forest
Golden Anniversary State Forest
Crosby/Ironton/Deerwood
Soo Line
North
ATV
Trail
BELTRAMI CO.
HUBBARD CO.
CASS CO.
WADENA CO.
CASS CO.
CASS CO.
CROW WING CO.
ITASCA CO.
AITKIN CO.
ST. LOUIS CO.
ITASCA CO.
AITKIN CO.
ST. LOUIS CO.
CARLTON CO.
CARLTON CO.
PINE CO.
CROW WING CO.
AITKIN CO.
AITKIN CO.
TODD CO.
MORRISON CO.

Comments on the Sandpiper Pipeline Proposal
MN Environmental Information Report

Socioeconomics 3.0

Routing Permit Docket No. PL-6668/PPL-13-474
Certificate of Need Docket No. PL-6668/CN/13-473

These comments are provided by the Carlton County Land Stewards (CCLS).

3.0 Socioeconomics

The first paragraph contains a partial list of short-term and long-term socioeconomic impacts. It lacks detail, and it focuses largely on community impacts rather than impacts on individuals. The sole long-term impacts discussed involve adding money to the tax rolls. It omits some of the more personal, potential short and long-term impacts to private landowners, including to mention but a few, reduced property values; potential economic and social impacts associate with difficult resale of a residence or properties due to the presence of an industrial corridor containing a hazardous material pipeline; potential loss of privacy during initial construction and during ongoing maintenance and monitoring activities conducted by the Applicant; loss of economic opportunity from the growth and harvest of multiple forest crops that grew within the pipeline right-of-way (ROW); reduced long-term crop yields for farmers – particularly organic farmers that depend on intact ecosystems to maintain soil fertility and an integrated pest management system; damage to long-term crop rotation systems that maintain soil health; uncertainty and inability to conduct future planning on property that will likely be disturbed by future pipeline construction and maintenance operations; and injection of human stresses leading to psychological stresses similar to PTSD for the residents living along the ROW who must on a daily basis contemplate the possibility of an unintended release that will destroy their economic security, their health, their livelihood, and their future. ***The PUC must require a more robust socioeconomic analysis of the impacts of this proposed Project. Those impacts should be studied by an independent third-party analyst, and reported to the PUC, with the results published in this report. The public must then be given an opportunity to make public comment on the results, and the PUC should withhold approval of the project until after the public comments have been received and studied by the PUC.***

3.1 Existing Socioeconomic Conditions

The analysis is a half-hearted list of glittering generalities, including such meaningless stats as "people per square mile", "county level population", and "per capita income". These valueless numbers fill space in the report but tell little about the socioeconomic impacts a project such as this will have on the economic health of each specific community and what the impacts will be to the individuals affected by the project. ***The PUC must require a***

more thorough socioeconomic analysis of the real economic and social impacts of this proposed Project on each community along the route. Those impacts should be studied by an independent third-party analyst, and reported to the PUC, with the results published in this report. The public must then be given an opportunity to make public comment on the results, and the PUC should withhold approval of the project until after the public comments have been received and studied by the PUC.

3.2.1 Construction Schedule and Workforce

1. In the first paragraph, the report states that the project will require about 17,315 person-years of temporary construction jobs. Those hours would likely be reduced somewhat if the Project utilizes the Northern Route alternative, since that route is approximately 44 miles shorter. Given that the Applicant will likely claim that the Northern Route will be slower and more difficult to construct, it may be fair to assume that both routes will require roughly the same number of person-years of work to complete. So, route selection will have little or no bearing on the gross number of person-years required to complete the project, and both will have about the same economic cost/benefit to complete.
2. Based upon anecdotal reports of hiring of local contractors during the recently completed Alberta Clipper Pipeline construction project, it appeared that most of the temporary workers were from out-of-state. Since this is a highly specialized field, this is to be expected. However, this results in fewer than expected local workers being hired for these well paying jobs. It also means that most of the monies paid out here are often spent in other states, and the benefits to local merchants must tempered with this reality. Once could expect a bump in sales for some vendors, but it will be not be for big ticket items, and will be for smaller ticket items such as food, clothing, fuel and temporary shelter.
3. Housing demand will increase as workers from outside the area arrive. Since housing is already critically short, this could have negative impact on those seeking rental housing such as college students, new families, and low-moderate income individuals, all of which could quickly be priced out of the rental market by these highly paid temporary workers. During the construction of the Alberta Clipper available rooms were in high demand. Because most of the workers were from out-of-state many workers stayed in "man-camps" located a short distance from the project site. This type of camp will likely be necessary again to accommodate the influx of these out-of-state temporary workers. Inadequate supply of hotel rooms also causes hardship for tourism-based businesses that provide important sources of economic activity for many areas along the proposed route.
4. Congestion from workers and equipment tends to be localized near the project sites, and the highways to the sites. This is unlikely to cause significant delays. There will be some delays and detours of traffic at job construction sites. These detours will

need to be closely coordinated with state and local road authorities. On page 3-7 it says that "NDPC does not anticipate that these Project-related demands on local authorities will be significant." There is no discussion in the report about reimbursement of LUGs for services rendered, beyond those that are anticipated. The Applicant and the LUGs need to come to an agreement for reimbursement of services whenever a threshold of hours is exceeded. Also, there will undoubtedly be higher than normal wear and tear on roads in and around the construction sites, due to higher traffic volumes and because of the size and weight of machinery used on these sites. NDPC should be made accountable for any unusual damage to state, county and township roads, as well as any non-public, state, county or corporate forest roads, used to access the Project. Private lands adjacent to the route are likely to be affected by encroachment by project vehicles, worker vehicles, and litter.

3.2.4 Loss of Agricultural and Timber Production

The Applicant believes that the project will have little more than a temporary impact on the productivity of agricultural sites. This may or may not be true for traditional farmers that depend on petroleum based herbicides and fertilizers. The same cannot be said for organic farmers that depend on the inherent soil fertility of their topsoil, and the microorganisms that inhabit the natural soil structures to maintain the fertility. They also depend on the surrounding ecosystem to provide pollinators, and predators that help control pests. These relationships are forever disrupted when a major project such as ROW construction through their farm destroys that delicate balance. This damage has been well documented in the MinnCan case (PUC docket #05-2003), including in the expert testimony provided by Dr. Deborah Allen in support of the Gardens of Eagan farm.

Since that time, conventional farmers have begun to recognize that the soil health and microbial activity that is essential to provide proper growing conditions in organic systems is also beneficial to their own farming systems. Soil health has also become a major focus of mainstream programs by the USDA, NRCS and University of MN Extension because of its role in making farming systems more resilient to flood, drought, insect damage, and disease suppression. Farmers are encouraged through mainstream agricultural programs such as the Conservation Security Program to develop long-term crop rotation systems that involve a variety of crop mixes including annuals and perennials. Construction activities cause significant medium-term damage to these crop rotations. Significant long-term damage is also likely since this route will likely be chosen for future pipelines, such as the Line 3 replacement program, and ongoing maintenance and repair operations frequently require periodic construction activity that disrupts the normal course of agricultural activity. For example, a number of farmers along the current mainline route in Wrenshall, MN have had some type of pipeline construction, mitigation, repair, or maintenance activities on their property each year for nearly 10 years. This represents serious disruption to these

agricultural systems. Northern Minnesota is in short supply of Class I prime farmland, and any damage to new parcels that have not previously seen pipeline construction should be taken very seriously. Prime and organic farmland are valuable natural resources that must be protected. Damage to these resources cannot be compensated for monetarily, and there is no way to damage it in one place and replace it elsewhere.

Finally, agricultural production, particularly organic farming and particularly in sensitive areas such as northern Minnesota, is heavily reliant on a network of other farmers and supportive institutions, businesses and consumers to be successful. The most successful hubs of organic production are formed when a critical mass of these factors come together to promote each other and the wider goals of food and community. The Blackhoof/Carlton/Wrenshall area near Duluth is one of those burgeoning hubs of activity, with new farmers supported by a network of existing farmers, retail businesses, non-profits, restaurants and local governments that all value the principles of local food and the community and connection that develops when a critical mass of rural residents is able to make a living from their own land. Because there is limited supply of land suitable to this type of production, this critical mass is endangered by new pipeline proposals, particularly those that seek routes that do not follow existing pipelines. It is not simply the agricultural system that is degraded, but also the social fabric of rural communities when proposals like that of the applicant are introduced with no regard to the impacts specific to each area and the special qualities of each property.

We use this as simply one example of the impact to an agricultural community along the route that has gone unnoticed in the applicant's documents. The members of the Carlton County Land Stewards have provided significant information to NDPC in the months preceding the route selection and are surprised that none of this information regarding the specific concerns of our area made it into the application. We are quite sure that other areas have their own specific needs and concerns about the proposed route, and are also dismayed that the applicant has provided no specific information about the environmental or socioeconomic issues particular to other communities along the route.

3.2.5 Tax Revenues

The tax benefits paid by the Applicant will do little more than offset the losses associated with decreased property values for all those private parcels along the proposed ROW. Once a pipeline is built on a property, there is a 10-20% drop in value of the ROW. Determining a drop in value for the home is more difficult to immediately determine, since this isn't calculated until after the property is sold. Since many properties become difficult or impossible to sell (without significantly reducing the asking price), many homeowners become trapped on their property, unwilling or unable to take the financial loss.

Finally, nowhere in this document is there an analysis of how many landowners, lessees or renters are impacted, how many homes, other buildings, wells or other personal property must be moved or removed to make room for this project, and how many farms and businesses will be impacted or displaced. Nor has there been an analysis of these factors with respect to the other alternatives in this report. ***The DOC and PUC must request an analysis of the above factors for each of the alternative routes, and the results are to be submitted for public review and comment. Only after these comments have been received and reviewed by the PUC should the decision on the route be made.***

Comments on the Sandpiper Pipeline Proposal
MN Environmental Information Report

Land Use 4.0

Routing Permit Docket No. PL-6668/PPL-13-474
Certificate of Need Docket No. PL-6668/CN/13-473

These comments are provided by the Carlton County Land Stewards (CCLS).

Land Use Affects pg 4-1 to 4-11

1. It is unfortunate that NDPC has chosen to consolidate data collected by LULC from 29 categories down to 5. This is the sort of step that makes interpretation of the data nearly impossible, and could lead to inaccuracies and incorrect assumptions. ***The PUC should request that NDPC provide an unfiltered, unconsolidated data set so that the public and DOC can fully evaluate the land uses across the landscape.***
2. According to the EIR the pipeline project will temporarily remove from timber production almost 2000 acres of land, 623 of which is permanent. Because this data is generated from satellite imagery, and likely was never ground truthed for accuracy, there is the possibility that the data under-represents young stands of timber, classifying them as grassland or shrub/scrub lands, meaning that there could be an even bigger impact on forest land than what is reported. Unfortunately, unlike agricultural use, forestry is considered incompatible with the development of this project, so this must be considered a permanent financial and habitat loss. ***The PUC must recognized the permanent loss of timber production, and the impact that an all new right-of-way (ROW) will have on the landowner's income and the forest industry as a result of this permanent loss. The forest products industry is a vital part of northern MN's economy. This should also be addressed under the socioeconomics section in the EIR.***
3. In table 4.2-1 Land Use Affected by Construction of the Sandpiper Project and 4.4-2 Land Uses Affected by Operation of the Sandpiper Pipeline Project, the data is displayed in such a way that there is no County by County analysis of the breakdown by land use categories. The tables don't display the percentage of each category within each county. For example, what percentage of the total land in Carlton County is forested, how much is agriculture, developed, etc. This information should be clear so the public, DOC, and PUC understand the potential affects of the project. ***NDPC should add a table to display the data so the percent by land use type by county is displayed in table form.***
4. In 4.2.1 NDPC identifies that almost 77% of the land proposed for this project is located on private lands with the balance made up of State and County lands. In order to accomplish this feat, NDPC has chosen to divert its project along a

proposed route that is 44 miles longer, and is completely out of the way of their existing ROW. The existing route, the Northern Route Alternative, makes a relatively direct line from terminal in Clearbrook, MN to the Project destination in Superior WI. The percentage of private land impacted by this proposal is far outside the average representation for land ownership in northern Minnesota, and is an obvious attempt to shift the burden of pipeline location disproportionately onto the private sector for this "public service corporation" project. We believe this is being done in large part so that NDPC can force its will upon these private individuals through threats of or use of eminent domain. ***The PUC must not allow this to happen, and must place the project on a route that more accurately reflects the ownership pattern across the northern part of Minnesota. To avoid public lands for a public service project is an inexcusable abuse of the law of eminent domain, and it cannot be allowed.***

5. In 4.2.2 para. 2, "NDPC has initiated consultations with affected watershed districts and counties to ensure that the Project is designed and constructed in a manner that is consistent with these land use plans." This entire paragraph offers nothing for the reader of this document to comment on, with no information on what these land use plans say, with no stated details of the discussions, no identification of potential issues, no discussion about possible resolutions to the issues, nothing. The reader is left completely in the dark as to the content or conclusions of the alleged consultations. ***The PUC must insist that details be provided to the DOC and the public, so informed decision-making can take place.***

6. The document in 4.3.1 Forest Land states that almost 2000 acres will be disturbed by this project, and about one square mile of forests will be permanently converted to grasses and herbaceous vegetation. ***The PUC must consider this permanent loss of forest land as a result of the creation of an all new ROW corridor, the wildlife and vegetative habitat lost, including the impacts of forest fragmentation on interior forest birds and other edge sensitive plant and animal species; the income that is lost to individual landowners and to the forest products industry; the loss of timber as a source of carbon sequestration; the impact on coldwater trout stream habitats once forest vegetation is permanently removed from the stream banks or in adjacent forests; the introduction of invasive species to the adjoining forests; the impacts caused by micro-climatic differences associated with the corridor opening; and the potential loss of cultural and recreational opportunities (enjoyment of their land). The EIR should clearly address these potential impacts so that the public, DOC and PUC are completely informed of the consequences and require NDPC to mitigate them. To mitigate these negative impacts, the PUC must place this project on the existing Northern Route***

Alternative or at the very least, require that the route follow existing Rights-of-Way (ROW).

7. In the final para. of 4.3.1 the document indicates that in the temporary ROW and workspace, the forested vegetation will be allowed to naturally regenerate to early successional forests, followed by late successional forest species. This will only happen if NDPC places one and only one pipeline within the proposed ROW. If as we anticipate, NDPC returns several more times to install additional pipelines, this stated successional pattern will never happen. ***The PUC must not be lulled into thinking that this is the final pipeline project for NDPC, on either the proposed "preferred route" or along one of the alternate routes. There will be more pipelines, and the cumulative impacts to the environment and the citizens of Minnesota will mount with each pipeline. However, impacts will be far less along an existing ROW, the Northern Route, than along an all new corridor. The PUC must place the proposed route on the existing Mainline ROW, the Northern Route Alternative or at the very least, require that the route follow existing ROWs.***

8. In the first sentence in 4.3.2 Agricultural Land, NDPC says "Approximately 1761 acres of agricultural land will be temporarily disturbed during construction..." The word, temporarily, is inaccurate. Once the pipeline trench has been dug, the soil can never be put back the way it was originally found. This is a permanent disruption of the soil profile. Based on examples found locally on the existing Enbridge Mainline ROW, replacement of the critically important topsoil could best be described as hit and miss after construction of the recent Alberta Clipper/Southern Lights project. There are local farmers that are still unable to get proper restoration of their field. One farmer said Enbridge backfilled the trench with frozen soils, resulting in sunken holes in his field. Topsoil over the excavation site is still lacking depth found in the adjacent portions of their fields. So, calling it a temporary impact clearly is more fiction than fact. Using frozen soil resulted in a second example of a cavity event, which occurred last fall when a section of County Road 1 sunk, caving in the blacktop. This resulted in a daylong road closure on the south side of the town of Wrenshall, MN, while temporary road repairs were done. Final repairs are to be done in the spring. The applicant states that they "consulted with the Minnesota Department of Agriculture ("MDA") to determine if any organic farms will be crossed by the preferred route" but made no reference to what they did with the information. Organic farms are sensitive ecosystems and are valuable natural resources that must be protected and any routing decision must take this into account. It is insufficient to mitigate damage through the APP; instead, pipeline routes must avoid crossing organic farmland whenever possible. ***The PUC needs to realize that once the soils are disturbed by excavation, there is no way to restore the natural environment of the site - the site is permanently damaged. That is why it is***

important that all new pipeline projects, including this proposal, stay within the same corridor to limit the damage to just that ROW or other existing ROWs and not proliferate damage to soils in "greenfield" areas.

9. In section 4.3.3, Open Water, it says "...NDPC will reduce the construction workspace width to 95 feet in wetlands to reduce impacts..." While 95 ft is a small step forward from the standard 120 foot width, it needs to be taken in context of future realities. ***Once the new ROW is established by this project, there is an overwhelming likelihood that additional pipelines will be added to the corridor, eventually widening the ROW. To prevent increased impacts at several locations across the landscape, the PUC needs to restrict ROW proliferation and require NDPC to use their existing ROW, the Northern Route Alternative or at the very least, require that the route follow existing ROWs.***

Comments on the Sandpiper Pipeline Proposal
MN Environmental Information Report

Geology 5.0

Routing Permit Docket No. PL-6668/PPL-13-474
Certificate of Need Docket No. PL-6668/CN/13-473

These comments are provided by the Carlton County Land Stewards (CCLS).

5.1.1 Mineral Resources

1. On pg. 5-5, second para., there is a statement that says there are (47) sites within 1500 ft the preferred route that are "possibly associated with non-metallic resources (20 gravel pits, 3 sand/gravel pits, and 1 sand pit) and 23 are tracts associated with active metallic mineral leases, all of which are in Carlton County." In Table 5.1.1-1 there is a listing of each site(County and milepost location, operation (type of mineral) and distance to the right-of-way (ROW). On pg. 5-7 there is then a statement that says the ROW would cross 10 active State Mineral Lease sites in Carlton County, leased to Kennecott Exploration Company, and that 2.4 miles of the active lease site would be crossed by the Project. At the bottom of pg. 5-7 it says the Project would cross an area of Greenstone is western MN, and that Greenstone belts have the potential to contain gold mineralizations. ***At no time is there a discussion of the impacts the Project would have on these 24 active sites, including physical disruption, loss of revenue to the landowners, mitigation strategies to reduce or eliminate conflicts between the Applicant and these landowners, and compensation planned to the landowners over real and future losses from the benefits these resources provide. It also only identifies existing mineral utilization sites, and fails to identify all of the commercially viable mineral deposits that are on the landscape, waiting to be developed in the future, and how that would also impact landowners financially in the future. The report also never addresses directly the challenges of crossing the Kennecott lease sites, nor the potential development of mineral resources at the Greenstone formation in western MN. So the public has a better understanding of theses two mineral formations, the Applicant should obtain a map from the MNDNR of the lease lands, and of the geologic formation considered to have potential exploitable mineral resources. These maps must be obtained, and the aforementioned issues must be addressed prior to route selection by the PUC.***
2. ***The PUC should require the Applicant to create a map displaying the information found in Table 5.1.1-1 so it's clear what is at stake for the landowners along the Project. There should be a second map showing potential sand and gravel resources within 1500 ft either side of the proposed***

project ROW. The public should have ample time to study these maps and provide informed public comment.

5.2 General Construction and Operation Impacts and Mitigation

1. In para. four it says, "There is the potential that future use of sand and gravel or mineral resources will be precluded where the pipeline is installed across these mineral deposits. In areas where the Project is located adjacent to any existing utilities, and sand and gravel deposits in the Project area will be unavailable for mining." ***Therefore, it is critically important that the DOC and PUC thoughtfully consider these ramifications during route selections, so that these potential losses of both resources and economic gain for present and future, are balanced against the need for this project at this location.***
2. On pg. 5-9 first paragraph, it says the "NDPC will continue to consult with the MNDNR, Carlton County, and Kennecott concerning metallic mineral resources and active mineral leases that will be crossed by the Project." ***First, this statement offers nothing for the public to comment on, because it fails to outline any of the potential issues being discussed or any possible solutions being offered. There is recognition that these are sensitive discussions and that some ambiguity is necessary at this time. Therefore, this document should not have been released until these issues were finalized. The PUC should reject this document at this time, due to its lack of specificity. There is no way for the public to comment on the matter, and no way for the PUC to rule on the route until this issue is settled. Once a settlement has been reached, the Applicant should amend this document and resubmit it for public comment.***
3. The Applicant needs to discuss strategies and identify locations on a map where unstable soils, primarily clay soils, are located along the proposed project ROW. This is a major issue of concern in eastern Carlton County where the Carlton County Soil and Water Conservation District (SWCD) is attempting to manage these clay soils to prevent slips, slides, and other erosion from reaching area streams that carry heavy sediment loads into Lake Superior. All disturbed soils are particularly vulnerable to this excessive erosion and the SWCD has been aggressively trying to reforest old farmlands and other grassy openings in an attempt to slow the erosion process. ***The DOC and PUC should request from the Applicant a set of strategies for successfully addressing erosion in clay soils within the project ROW, and also request a soil map overlaid with USGS topographic lines, so proper evaluation of the project and the remedies can be studied. DOC should review these strategies in conjunction with the Carlton County SWCD and seek their input as to the effectiveness of the proposed strategies.***

Comments on the Sandpiper Pipeline Proposal
MN Environmental Information Report

Soils 6.0

Routing Permit Docket No. PL-6668/PPL-13-474
Certificate of Need Docket No. PL-6668/CN/13-473

These comments are provided by the Carlton County Land Stewards (CCLS).

6.2.2 Soil Characteristics and Assessment

1. In Table 6.2.2-2, Topsoil depth >18 inches, it shows 42.2 acres. This is extremely doubtful, and suggests an error in the dataset. The possible error becomes more pronounced when the reader looks at Table 6.2.2-3 Topsoil Depths for Prime Farmland and finds zero (0) acres listed for soils >18 inches. While this is believable, it points out the inconsistency between the two Tables. ***The Applicant should correct this error and then redistribute this document.***
2. In Table 6.2.2-1 there is a column labeled "Reveg. Concerns". The number of acres is sizeable, approaching 1560 acres. This issue is never defined in the document, nor are these concerns or the necessary mitigation strategies ever addressed. ***The DOC and PUC must request that the Applicant define the concerns, address these issues and describe mitigation strategies, and then offer the public an opportunity to comment on these concerns and how the Applicant proposes to address them.***

6.3.1 Prime Farmland and Topsoil Segregation

At the top of pg 6-5 the document states that about 36% of the soil crossed by the project is considered prime farmland and 25% is soil of statewide importance. So, about 61% of the proposed ROW is on the best farmland available in a region of the state where such land is in short supply is an unacceptable burden to place on communities in northern MN. This is important because once these soils are disturbed by the construction of this right-of-way (ROW), they will be in a degraded state as a result of soil compaction and rutting, loss of topsoil or mixing of topsoil and subsoil, destruction of soil ecology that is essential to organic and sustainable farming, erosion of the soils as the site is re-vegetating, and disruption of surface and subsurface drainage patterns. It's unlikely these sites could ever again be considered as prime farmland. Areas with clay subsoil and shallow topsoil such as can be found in the vicinity of Wrenshall, MN are particularly sensitive to this type of disturbance, and many farms in the area have experienced direct, long-term impacts from the construction of previous pipelines. Other areas of the state may or may not suffer such significant impacts, but the Applicant makes no mention of different characteristics of the agricultural soils in different parts of the route and engages in no examination of the issue. This is despite a great deal of public input during their route selection process from many members of this community. Therefore, we would disagree with the statement made in the

last sentence of the 2nd para on pg 6-5, where it says, "With mitigation measures specified in the APP ... these impacts will be temporary and will not result in a permanent decrease in soil productivity." These sites will take centuries or millennia to heal. In addition, it seems unlikely that impacts will only happen during the initial construction phase. Additional damage will occur for the life of the ROW as routine maintenance is performed and as additional pipelines are added to the ROW. This exacerbates the injury to the soils and keeps the wound from healing until after all ROW operations have been permanently suspended. Furthermore, future uses of this land would be limited, as soils disturbed by pipelines are no longer suitable for high-value crop production such as organic crops and vegetables.

The Applicant believes that the project will have little more than a temporary impact on the productivity of agricultural sites. This may or may not be true for traditional farmers that depend on petroleum based herbicides and fertilizers. The same cannot be said for organic farmers that depend on the inherent soil fertility of their topsoil, and the microorganisms that inhabit the natural soil structures to maintain the fertility. They also depend on the surrounding ecosystem to provide pollinators, and predators that help control pests. These relationships are forever disrupted when a major project such as ROW construction through their farm destroys that delicate balance, resulting in reduced long-term crop yields and quality and damage to long-term crop rotation systems that maintain soil health. This damage has been well documented in the MinnCan case (PUC docket #05-2003), including in the expert testimony provided by Dr. Deborah Allen in support of the Gardens of Eagan farm.

Since that time, conventional farmers have begun to recognize that the soil health and microbial activity that is essential to provide proper growing conditions in organic systems is also beneficial to their own farming systems. Soil health has also become a major focus of mainstream programs by the USDA, NRCS and University of MN Extension because of its role in making farming systems more resilient to flood, drought, insect damage, and disease suppression. Farmers are encouraged through mainstream agricultural programs such as the Conservation Security Program to develop long-term crop rotation systems that involve a variety of crop mixes including annuals and perennials. Construction activities cause significant medium-term damage to these crop rotations. Significant long-term damage is also likely since this route will likely be chosen for future pipelines, such as the Line 3 replacement program, and ongoing maintenance and repair operations frequently require periodic construction activity that disrupts the normal course of agricultural activity. For example, a number of farmers along the current mainline route in Wrenshall, MN have had some type of pipeline construction, mitigation, repair, or maintenance activities on their property each year for nearly 10 years. This represents serious disruption to these agricultural systems. Northern Minnesota is in short supply of Class I prime farmland, and any damage to new parcels that have not previously seen pipeline construction should be

taken very seriously. Prime and organic farmland are valuable natural resources that must be protected. Damage to these resources cannot be compensated for monetarily.

6.3.4 Droughty Soils

The document identifies that about 37% of the soils are identified as droughty. These soils can be difficult to re-vegetate except during times of ideal moisture frequency. The Applicant proposes to use extra mulch to hold in moisture, use a drought tolerant seed mix, and they propose doing "timely reseeding". While the first solution seem reasonable, dependence on "species tolerant of dry conditions" and "timely seeding" seems somewhat problematic. Even drought resistant species require sufficient moisture to germinate and establish themselves. The resistance to drought is inherent not in the new sprouts, but in well established mature plants with deep root systems. Young plants are always susceptible to drought. And a prolonged drought during the rehab phase will make vegetation establishment on these naturally droughty soils very difficult or nearly impossible for extended periods of time. This failure in revegetation will leave the site susceptible to continued erosion, resulting in further degradation of soil life and topsoil sedimentation being deposited in streams and wetlands. The plan fails to address these critical components. ***The DOC and PUC must request that the Applicant develop a more robust alternative for dealing with failed revegetation on these droughty soils. Failure to adequately revegetate these soils leave them vulnerable for extended periods to erosion from wind and heavy downpours, resulting in soil movement off site into nearby wetlands and watercourses. This would clearly be a violation of MN Stormwater Permitting and would cause long-term damage to crop land and the aquatic ecosystems***.

The report identifies a number of other challenges with the soils along the "preferred route" that are not discussed in any way in the report. For example, there are over 1900 acres of hydric soils (water saturated), almost 1200 acres of soils that are compaction prone, and 4432 acres of highly erodible soils. These deserve to be addressed, with potential strategies listed for the protection or treatment of these problematic soils. Some solutions are simple, such as using frozen ground operations only in hydric soils. Others are going to need more fleshing out, such as protections for and treatment of compacted soils. With over eight square miles impacted by the Project, there is ample soil disturbance to warrant close scrutiny. The sites considered challenging for these reasons must be detailed by the applicant so that the public, particularly landowners, can correct the record in case the applicant does not have a correct understanding of the potentially sensitive nature of the soils on their property. ***Therefore, the DOC and PUC should request a more detailed discussion of the issues and possible solutions for dealing with these challenging soils identified in Table 6.2.2-1.***

TABLEs 6.2.2-1 and 6.2.2-2 – According to table 6.2.2-1, 50% of the land along the route in Carlton County is in prime farmland and 50% along the route has revegetation concerns. According to the table 6.2.2-2, 86% of the soils along the preferred route in Carlton County has 0-6 inches of topsoil. Table 6.2.2-3 shows that 100% of the prime farmland along the preferred route in Carlton County has 0-6 inches of topsoil. This indicates it is imperative to preserve the topsoil quality in Carlton County and its prime farmland. With such a thin veneer of soils, it is critical to not intermix topsoil with subsoils. NDPC states they will salvage this topsoil and replace it during reclamation. However it is difficult, if not impossible, to salvage such a thin layer using a dozer or excavator without intermixing it with subsoils which are predominately clays. The Environmental Protection Plan (EPP) states, "If less than 12 inches of topsoil are present, the Contractor will attempt to segregate to the depth that is present". This does not sound like NDPC takes salvaging topsoil seriously and does not commit to preserving it. Will the NDPC contract require topsoil 0-6 inches thick to be salvaged and hold the contractor accountable or will the contract only say they should "attempt" to salvage it? Will there be a quality control/quality assurance (QA/QC) clause in the contract to salvage critical topsoil? Repeated trips by heavy equipment, trucks, and other motorized vehicles on fine textured soils will result in deep compaction of soils. Section 1.18 of the EPP, NDPC states, "Cultivated fields and compacted or rutted areas will be tilled prior to topsoil replacement with a tillage device or chisel plowed to loosen compacted subsoils." The result of such tilling would leave deep furrows. Placing 0-6 inches of already compromised topsoil over this very rough terrain would intermix the topsoil even more with subsoils and most would end up in the deep furrows after rains and settling. Therefore, we believe, the productivity of 86% of the topsoil in Carlton County will be greatly compromised during construction and after reclamation and will have a much reduced capacity for growing crops and thus will permanently be considered undesirable for agricultural purposes. We expect that all of the capacity of prime farmland along the route (50% of the route miles in Carlton County) would be negatively affected and result in an undue burden on landowners and negatively affect the socio-economics in Carlton County. In addition to reducing the productivity of the topsoil, weeds and invasive species will have an advantage in this soil that has been marginalized and will most likely out compete native plants. The pipeline route would convert agricultural fields and other areas to weed patches requiring huge mitigation efforts that would include treating soil compaction caused by motorized vehicles and may require the use of dangerous chemicals for a very long time. ***Therefore, the PUC must not permit NDPC's route in "greenfield" areas in Carlton County and must require them to follow the already compromised Northern Route or follow other existing utility ROWs. The Carlton County Route Alternative should be dismissed since this route is through the "organic farming district" that has some of the best prime farmland in the county. In addition, more effective soil mitigation methods should be required in the permit.***

Comments on the Sandpiper Pipeline Proposal
MN Environmental Information Report

Vegetation, Wildlife, and Fisheries 7.0

Routing Permit Docket No. PL-6668/PPL-13-474
Certificate of Need Docket No. PL-6668/CN/13-473

These comments are provided by the Carlton County Land Stewards (CCLS).

7.1.1 Existing Vegetation Resources

The vegetation patterns described in the report give such a broad overview that it is of little value, and provides nothing that a reader can comment upon. There should be a more detailed listing of the survey data and a more thorough evaluation of that data, with a Table designed to stimulate thought about the evaluation of the project. We don't need generalities, we need specifics about the land and vegetation right where the pipeline alternatives are proposed. What happens outside the corridor is just background information that distracts from the evaluation of the Project. ***As an example, a local naturalist on the preferred route has observed 200 wildflowers species. That's the kind of detail surveying and reporting needed for this document.***

7.1.2 Ecological Classification

1. Since this project crosses four different ECS Provinces, we need a more discrete dataset that segregates the types of vegetation seen along the proposed right-of-way (ROW) in each Province with a display by percent for each vegetation type.
2. There needs to be a map showing the Provinces, and displaying each of the proposed alternatives, as well as the "preferred route".
3. The description of the Provinces is to too general to be of much benefit. The data needs to be more specific to the vegetation found along the proposed ROW, including all of the alternatives and the preferred route. For example, without a map it is difficult to know where in the Tallgrass Aspen Parklands Province the route passes. For example, the description of the Province says "Agriculture is the dominant land use in the southern half of the subsection, though more recently extensive areas have also been cleared for farming in the northern half." So, is the proposed route in a largely agricultural area or not? This report doesn't provide that information, and therefore is of little value in developing specific comments about the project.

7.1.3 Sensitive Plant Communities

Native Plant Communities

The report states that "In 2014, NDPC will complete early-season rare plant surveys at 17 sites and late-season rare plant surveys at 9 sites." What is their definition of a site? Since

survey work has not been completed, and preliminary results of data from 2013 was not revealed, it would appear this EIR is not ready at this time for public review and comment. ***The PUC should withhold approval of this document until after the results of the survey for sensitive rare plants is completed, the results are published in this document, and the public and MNDNR has had ample time to review and comment on the findings. The Applicant and PUC in coordination with the MNDNR should develop mitigation strategies that protect sensitive plants and plant communities, and see to their inclusion in a revision of this document.***

Sensitive Forest Resources

In addition to the special features identified in the report, including Old Growth, the MNDNR is also in the process of finalizing criteria for selection of Lowland Old Growth Forests. ***In order to avoid possible conflicting management goals, the Applicant should consult with the MNDNR regarding implementation of the Lowland Old Growth Criteria for stand selection. The Applicant should request that the MNDNR review the new Lowland Old Growth Criteria and provide the Applicant with a stand level review along the proposed preferred route, as well as the other alternatives, to see that there are no candidate stands of Lowland Old Growth in these corridors.***

7.1.4 General Construction and Operation Impacts and Mitigations

1. In para. 1, the report recognizes both short and long-term consequences resulting from the project. Depending on the Province, vegetation within the ROW, and vegetation types found in the refuge adjacent to the ROW, there will be species re-colonization by grasses and forbs within the first year after completion of construction. ***The Applicant's dependence on natural regeneration for the re-establishment of woody vegetation discriminates against conifer species*** that depend on natural seeding to (re)establish themselves. Lack of a seed source following tree removal could lead to hardwood domination of a former conifer site. Re-establishment of any timber will take several years, particularly for conifer species that do not resprout. ***In some cases, species present prior to construction may be eliminated during the clearing process, and will be permanently eliminated from that vicinity***. In the end***, no timber or brush species will be allowed to re-colonize the permanent ROW.***

2. In para. 2 the Applicant recognizes that impacts within the 120 ft wide workspace will have detrimental impacts on vegetation outside that zone. "Clearing trees in the construction right-of-way could affect undisturbed forest vegetation growing along the edges of the cleared areas." ***The use of the term "undisturbed forest vegetation" is therefore inappropriate, since there is a clear understanding that there will be additional disturbance resulting from soil compaction,***

disturbance of roots during excavation, smothering of roots cause by piles of excavated soils, increased susceptibility to windthrow and/or desiccation following creation of a new corridor in a formerly protected part of the stand, and mechanical damage to roots, trunks and crowns cause by large equipment. Therefore, the impacts on forest lands stated in the document will under-estimate the length and acreage of that disturbance. There is also recognition that the corridor will impact species composition near the ROW, favoring pioneer species over more shade tolerant species. This can have an impact of future landowner incomes, since most pioneer species are considered less valuable than shade tolerant species, as well as impacts on wildlife habitat.

3. In para. 3 the Applicant states the project will clear about 2.4 square miles of timber, of which about ***one square mile will be permanently converted from timber to grass and weeds. Since the Applicant has recognized the impacts will reach beyond the cleared ROW, this must be viewed as a very conservative estimate.***

7.2.1 Existing Wildlife Resources

The list of species reportedly found along the proposed ROW is both incomplete and inaccurate. A neighbor, an amateur naturalist, on the preferred route in eastern Carlton County has observed over 200 species of birds, 65 of those are breeding birds species, including threatened golden-winged warblers; 40 mammal species; 15 reptiles and amphibians; 50 species of butterflies. That is over 370 animal species, and it does not include the vast array of other insects not listed here. ***The list provided in this report is composed largely of generalist species that could be found almost anywhere, and it provides little information about the true abundance and variety of wildlife that will be displaced by the construction of the proposed ROW. Although the generalist species will still be found following construction, species with specific habitat needs will be adversely affected to varying degrees by the project. But in examining this report, you'd never learn that. The PUC must require a more thorough survey of wildlife found immediately adjacent to the proposed ROW, and require a species by species review of the impacts that the habitat changes would cause to these species. The public must be provided an opportunity to review this information and analysis and comments must be accepted following this review.***

7.2.2 Special Wildlife Areas

Wildlife Management Areas

1. The report gives very broad descriptions of the four Wildlife Management Areas (WMS) crossed by the Project. There is insufficient detail upon which to make informed comments. ***At a minimum the PUC must request additional survey information about the plant and animal species found in the WMAs, a brief***

description of the habitats used by each animal species, and discuss the impacts the Project would have on the habitat and wildlife species.

2. There is a broad scale map (7.2.2-1) showing the position of the Project and general location of the WMAs in MN, but there are no detailed maps provided in the report that illustrates where the Project will cross through each of the WMAs. One map should include USGS Quad features, possibly with an aerial photo background. A second map should display cover type boundaries and stand labels, available from the MNDNR Resource Assessment Office. ***The DOC should request this data from the Applicant, including all WMAs potentially crossed by each alternative, so an informed comparison and decision can be made. This information should also be used to fine tune the route to avoid impacts to WMAs.***
3. ***A table should be developed for each WMA to display the acres of habit by cover type, which would be impacted by the Project.***
4. The report says that "NDPC continues to consult with MNDNR regarding these WMA crossings." There is a glaring lack of detail about these ongoing discussions. ***The PUC should request that the Applicant provide details on these discussions, including but not limited to any issues of concern, alternatives being proposed by each side, impacts being mitigated, and proposals still being considered. It would seem reasonable that the PUC should delay consideration of the route until these issues are resolved and disclosed for public review and comment.***

Large Block Habitats

1. Habitat fragmentation of larger blocks of contiguous habitat is discussed, but the Applicant states that "Approximately 75 percent of the route that crosses these contiguous areas is co-located with existing third-party rights-of-way, thereby avoiding new fragmentation of large block habitats..." Without knowing the size of the existing ROW, the habitat types present, the species present in that habitat, the tolerance of these species to the expansion of the existing corridor, and the ability of other species to take advantage of this newly expanded edge corridor for predation or for exploitation of other competitive advantages, it is difficult to render a decision on what impacts this new intrusion will have on the population health of the negatively impacted species. The report then goes on to describe the extent to which the Project impacts large block habitat for the other 25%, listing the distances the Project will intrude upon these blocks. Again, without knowing the size of the block, the location of the intrusion into the block, plus all of the criteria previously listed, it is difficult or impossible to know the extent of the impacts on the species inhabiting that piece of ground. In the way it was written, it appears the Applicant is attempting to "marginalize" the impacts the project will have on these important habitat components. For example, the Applicant says "Large block habitat crossings will be restored, allowed to revegetate, and will retain their original habitat function

after the pipeline is constructed..." If this is a forested habit type, and the Applicant has previously stated that trees and woody shrubs will be perpetually eliminated from the ROW, than this statement cannot be true. It is the interior forest birds, particularly neo-tropical warblers that are most vulnerable and impacted with the loss of large interior habitat blocks, due to predation by cowbirds and competition from generalist species that take advantage of these large gaps in the forest habitat. This process becomes increasingly problematic as the gap size expands, which would happen with the addition of any additional pipelines. ***The DOC and PUC must carefully consider the negative impacts associated with the construction of an all new pipeline corridor on large block habitats, not just on the State WMAs, but across the breadth of the state on all ownerships. The PUC must request that the Applicant conduct a thorough analysis of the impacts on all large block habitats on all ownerships, to obtain a true picture of this project. The results should be published in this document, and the public given ample opportunity to comment on these results.***

Key Habitats

According to the report the MNDNR has supplied NDPC with a listing of the Key Habitats for Minnesota's Species of Greatest Conservation Need (SGCN). It also states, many of these Key Habitats overlap with Native Plant Communities and large block habitats. And "Consultation with MNDNR regarding minimization of impacts to Key Habitats is ongoing." This again provides the public nothing upon which to comment. This report will not be ready for public comment until the Applicant and MNDNR have identified the issues, discussed and come to agreement on mitigation strategies, settled on way to avoid habitat destruction, minimized the impacts, and mitigated and/or repaired the damages to the habitat. ***Until the MNDNR and Applicant reach a conclusion on their discussions, and the results are reported in this document, and the public has had an opportunity to review and comment on the results, the PUC must withhold approval of this document.***

7.2.3 General Construction and Operation Impacts and Mitigation

1. The report says "Construction and operation of the Project are not expected to have a significant impact on wildlife." Will wildlife disappear from the corridor? Not likely, but will the project have a significant impact. We believe it will. The construction of an industrial corridor is bound to have big impacts on the local wildlife. The species generalist that will thrive across a wide range of habitats will do just fine. But habitat specialists may struggle and eventually disappear. That is not insignificant, and it needs more consideration than what was given by this report. The long-term permanent loss of a square mile of forest habitat is in itself, a significant loss. The loss of large block habitat and fragmentation, not just on the small parcels of WMA lands, but across 300 miles of proposed corridor, are truly major impacts to habitat.

In analyzing this fragmentation, the Applicant and DOC must also factor in the mortality of timber beyond the proposed ROW width, so a realistic view of the overall impacts can be more accurately measured. To picture the impact for yourself, imagine a 120 ft wide corridor suddenly appearing in your yard, maybe obliterating your home. Does that have an impact? Certainly it would. So, why is it not significant when it's wildlife habitat? The report recognizes that wildlife will be displaced. In the above example after your house is gone, you must now find a new place to live, a new source of food, and must compete with all your neighbors for those limited resources. Now, examine your survival options in this scenario if you are not very mobile. Will you survive?

2. In para. 4 there is a recognition that this project may lead to the introduction of invasive species. Most invasive species have negative impacts on wildlife, displacing food and cover that wildlife depends on. ***Controlling invasive species following construction must be a mandatory part of the permitting process.***
3. In para. 5 it states that woody vegetation in the temporary workspaces and additional temporary workspaces will be allowed to revegetate naturally with trees and shrubs. This is viewed with some skepticism, since it is widely believed that once a new corridor is developed, there will be a rapid succession of additional lines added to the ROW. This will result in the permanent loss of this habitat. However if this fails to occur, ***it should be the responsibility of the Applicant to immediately replant tree seedlings, particularly conifers that do not resprout following cutting, with those species appropriate to the landscape setting. This should happen during the first growing season, using either bare root stock during the dormant season, or with container grown stock during the active growing season. Assuring seedling survival into the third growing season should also be the responsibility of the Applicant.***
4. In the first para. on pg 7-11, there is recognition that this project will negatively impact animal species dependent on forest interiors in large blocks. The Applicant attempts to marginalize this loss by saying using "parallel existing, maintained rights-of-way will not have a significant effect on wildlife species." This simply isn't the case, and impacts will grow as the ROW expands to accommodate the installation of each new pipeline in this new pipeline ROW. ***It's a prime example of the unrecognized result of cumulative impacts.***

7.3.1 Existing Fisheries Resources

Representative Fish Species

There is no comprehensive listing of fish species listed for either the warm-water or cold-water habitats. Even Table 7.3.1-1 listing Game Fish is incomplete. This information could be easily obtained by the Applicant from the MNDNR. ***This information should be added***

to this report, and provided to the DOC and PUC so an accurate analysis of the data can be included in the decision making process.

Designated Trout Streams

1. Because the report lacks details about the source of this information, the DOC should verify the number of trout streams, and trout stream tributaries with the MNDNR Div. of Fisheries. ***By state statute, all streams within a legal section containing a designated trout stream are also considered trout stream waters. The Applicant should include a map showing these streams to understand the impacts***
2. It is good to see that NDPC will be working with MNDNR (Regional Assessment Ecologist) to plan these stream crossings. It certainly would be beneficial for the public to have the details of those discussions, the alternatives being discussed, and the final decisions regarding these crossings. ***The PUC should insist that the Applicant provide a detailed account of the issues discussed, the alternatives proposed and the mitigation strategies agreed to for crossing these designated trout streams and their tributaries.***
3. In reviewing Table 7.3.1-2 Trout Stream Locations along the Sandpiper Pipeline Project Area, there are 5 crossings within the Blackhoof watershed. The data indicates that there are three crossings listed for milepost 586.7, and two at milepost 586.8. Are these milepost locations correct? To have two or three crossings in essentially the same location may have larger impacts than one crossing at a single crossing point. Perhaps a detailed map or aerial photo showing the proposed crossing sites on the Blackhoof should be included with the Table, to clarify what is being proposed and possibly why it is needed. ***The DOC and PUC should request a map from the Applicant detailing the proposed stream crossing locations on the Blackhoof River, and this map should become part of this document.***

Aquatic Management Area

A more detailed analysis of the fisheries at both the Spire Valley Hatchery and LaSalle Creek AMAs should be provided in his report. Since Spire Valley Hatchery is assuming greater responsibility of raising the states cold-water species, special precautions to protect the water quantity and quality, including water temperature, is of primary concern. The report should also provide a detailed map showing the hatchery facilities, and the location of the proposed Project. ***From the information provided there is no way to determine if the hatchery is upstream or downstream from the Project. This has real implications if there was an unanticipated discharge from the pipeline that could contaminate the hatchery water source, killing the hatchery stock, and requiring extensive cleanup before hatchery operations could resume. There is also no mention in this report of any discussion with the MNDNR about these or other possible concerns.***

7.3.2 General Construction and Operation Impacts and Mitigation

1. In reading through this section I see no reference to MN BMPs that prohibit operation within cold-water streams during the trout spawning season. ***These are published dates in the BMP Handbook, and they must be adhered to by the Applicant during the construction of the Project. The PUC must include these BMP as part of the permit.***
2. It appears in the report that the applicant has marginalized the loss of a year-class of fish, saying "Some mortality of less mobile organisms, such as small fish and invertebrates may occur within the trenching area." And, "Sediment loads may temporarily increase downstream during open-cut stream crossings. These increased loads may temporarily affect the more sensitive fish eggs, fish fry, and invertebrates inhabiting the downstream area." They cite a study (Reid and Anderson) that indicates that open-cut installation "where effects did occur, the effects were short term, and recovery generally occurred within a year of construction." Our interpretation is that near the trenching site, if done during or after the spawn, or while fry are still vulnerable, there will be mortality of the eggs and young fish. ***Therefore, timing of installations near streams, particularly cold-water fisheries, is critically important to minimize impacts on the aquatic life. The PUC must make it part of the permit that installation be done in accordance with BMP Site Level Guidelines, and following written approval of the MNDNR.***
3. The Applicant marginalizes the impact of the Project by saying "...light and temperature characteristics of some streams may affect the behavior patterns of fish, including spawning and feeding activities, at the pipeline crossing location. The maintained streambanks, however, are not wide enough to have a significant impact on general temperature and light conditions of the streams crossed by the Project." ***This point may be disputed as cold-water streams are suffering from the cumulative impacts of multiple developments within the watershed, exacerbated by a warming climate. The DOC should discuss this with MNDNR Cold-water Fisheries and MN PCA staff that are familiar with these issues. DOC should then make appropriate recommendations to the PUC that will mitigate further impacts to these sensitive resources.***

7.4 Threatened and Endangered Species

1. The Applicant states that it received a list of federally endangered, threatened and candidate species that may occur in the Project area in MN. The Applicant should provide the list in Table form for the report. ***Once the list has been entered in the report, the public should be given time to review the list and provide public comment related to habitat concerns impacted by the Project.***

2. The Applicant states there was discussion with the USACE and USFWS to consider recommendations regarding the Endangered Species Act, Migratory Bird Treaty Act, and Bald and Golden Eagle Protection Act. These discussions are reported to be ongoing. ***After all issues and discussions have been finalized, the details of these discussions between the Applicant, USACE and the USFWS, including but not limited to issues raised during discussions of the Project, proposed mitigation strategies, and agreements reached during these discussions, appropriate details should be provided, and the public given an opportunity to review these comments and provide public input.***
3. The Applicant has consulted with the MNDNR on the presence of threatened and endangered species in the vicinity of the Project. Species were listed in table 7.4.1-1. The Applicant reports that they are still consulting with the MNDNR regarding rare plant surveys, and that they will continue to consult with the MNDNR regarding ongoing habitat assessment and field surveys, relating to the potential presence of threatened and endangered species. ***The DOC and PUC should withhold approval of this document until all survey work is complete and reported as part of this document.***

General Construction and Operation Impacts and Mitigations

The report states the Applicant will continue to consult with both the MNDNR and USFWS on mitigation strategies for special-status species. ***The fruits of these discussions need to become part of this document before final approval is granted.***

Comments on the Sandpiper Pipeline Proposal
MN Environmental Information Report
Ground Water 8.0
Routing Permit Docket No. PL-6668/PPL-13-474
Certificate of Need Docket No. PL-6668/CN/13-473

These comments are provided by the Carlton County Land Stewards (CCLS).

8.2.2 Federal and State Designated Aquifers

In both the second and third para., found on pg. 8-2 and 8-3, the Applicant states in the document that the Project crosses two Drinking Water Supply Areas, one near MP 433 for Sundsrud Court, near Park Rapids and the other at Wrenshall between MP 594.7 and 595.3, for the Wrenshall Wellhead Protection Area. The latter is 390 ft. from the Project. In both cases the Applicant provides the location but no other useful information, such as, direction of groundwater for each area. There is no discussion of any additional steps being planned to protect the drinking water supplies for these communities, no actions planned to divert around these critical sites, no comments provided by the Minnesota Dept. of Health that would provide insight into the planning efforts to protect or respond to an emergency discharge at these sites. All this document provides is a statement that, "NDPC has initiated consultation with the operators of the WPA and the MDH regarding this crossing." ***For a topic of such grave importance, one that is at the forefront of every person's mind along this proposed project, this is totally insufficient and unacceptable. The public has little or nothing to comment on. Clearly this document is not ready for public comment and the PUC must reject this document as submitted and require the Applicant to provide a more robust explanation on how they will either reroute the Project to avoid these public drinking water wellheads or how they will provide substantial mitigation measures to safeguard these sites from any and all contamination from this Project, during both the construction and subsequent operation phases. Until the Applicant provides documentation that meets these requirements and until these documents are supported by the wellhead operators and the MDH, the PUC must reject this Project as currently submitted and withhold approval until such time as the document has operator and MDH support.***

8.2.3 Water Supply Wells

1. The Applicant is using the CWI to identify private drinking water well locations across the state. This may substantially under-report wells within 200 ft of the Project. It is likely that there are variations in the accuracy and completeness of county databases from county to county, and within each county, as exemplified by this document reporting only two counties and just nine wells along the 300 mile Project. ***The PUC must require the Applicant to do an exhaustive ground verification of***

every well site down gradient from the pipeline that could be contaminated by an accidental discharge along the Project before the true magnitude of the issue can be evaluated. The PUC should consult with the MDH to determine a safe distance standard, based on soil types and depth to ground water drinking sources along the proposed ROW, and have the Applicant survey all residences within the zone that is considered vulnerable. Once the applicant has completed this survey and re-published this chapter, the public should be given time to comment on the results.

2. The Applicant mentions no alternative options for avoidance of drinking water wells located along the proposed Project. There are two obvious options: moving the proposed Project to create a safe buffer or moving the well. If the optimal solution is to move the well, this should be done at the expense of the Applicant, including all drilling costs, cost of a new pump if necessary, cost to run water from the new well to the residence and for connection of this new line to the residence, and all costs associated with removal and sealing of the old well as prescribed by statute. ***The PUC must request that the Applicant offer suitable options, including those stated here, to protect the drinking water supply of each landowner along the entire proposed ROW, and allow the landowner to select their preferred option.***
3. The Applicant has failed to identify any mitigation strategies for dealing with wells contaminated by the construction and operation of this proposed project. As usual, when dealing with any controversial topic, the Applicant has resorted to generalities, such as, "NDPC will develop site-specific plans for wells that could be impacted by construction." What if the impact occurs during the operation phase and not the construction phase? The Applicant is mum on this topic. ***The PUC must insist that the Applicant provide a much more robust series of options for dealing with well contamination as a result of construction, maintenance and operation of the proposed Project, and make those options available in this document. Therefore, the PUC must reject this chapter as submitted, as being inadequate. Until such time as the Applicant submits the new document and the PUC re-opens the document for public comments, including, those provided by the MDH and County Health Depts. This document and permit application must be rejected as incomplete.***

8.3 Contaminated Groundwater

On pg 8-5, in Table 8.3-1 "Contaminated Sites within 0.5 Mile of the Sandpiper Pipeline Project", there appear to be multiple errors in the dataset displayed in the table for Carlton County. For example, the first entry is for the Minnesota Sex Offender Program in Moose Lake. It says this site is at MP 569.4 and is 1459 ft from the centerline. In reality, MP 569.4 is approximately 1 mile east of Mahtowa, and is 10-12 miles northeast of this Moose Lake facility. The next 8 sites are all listed at MP 591.0 and include the City of Carlton and

Barnum, and all 8 sites are 5 ft from the centerline. The distance from Carlton to Barnum is over 12 miles, and neither of these sites are close to the proposed Project. ***The PUC must require the Applicant to verify and correct the dataset, and then resubmit it for public comment.***

8.4 General Construction and Operation Impacts and Mitigation

1. The first para., when referring to shallow aquifers states "Once the construction activity is completed, the groundwater levels typically recover quickly." What is this statement based on? NDPC should disclose how they arrived at this conclusion or reference studies. It is very likely that shallow water aquifers, like wetlands, will be permanently impacted by the presence of the pipeline, which could act like a dam, restricting the lateral natural flow of waters. Typically this results in ponding of water on one side of the pipeline (and flooding of existing vegetation and conversion of wetland type), and a drop in water level on the other side of the pipeline. ***The PUC and DOC needs to evaluate the impact caused by pipeline construction on the natural aquatic system, and reject the premise proposed that impacts are minor and recovery quick. It doesn't work that way in the real world.***

8.4.1 Blasting

The document states that blasting "in a bedrock aquifer has the potential to adversely affect water quality and water yields in nearby wells." Since this project will likely encounter bedrock in eastern Carlton County, it is important that this chapter document exactly what remediation step the Applicant must offer to impacted landowners caused by blasting along the proposed Project. This document is silent on any mitigation/compensation strategies to address this issue. ***The PUC must insist that the Applicant offer mitigation/compensation strategies for dealing with the loss of water quality and quantity as a result of blasting or any other project construction and operation activities. These options must be placed in this document, and the public must have an opportunity to comment on these strategies. The PUC must also insist that the Applicant document that they will be entirely responsible for all mitigation costs associated with restoring water quality, quantity or both. This mitigation must include preconstruction baseline water chemistry analysis for the types of materials the pipeline is expected to transport for the wells along the project.***

8.4.2 Releases

After reading the chapter on releases, either during construction or during the ongoing operation and maintenance of the pipeline, there are apparent gaps in the information the public deserves to have provided by the Applicant. First, there is no explanation of what liability the Applicant assumes should their pipeline have a release. Will the Applicant adequately compensate the landowners if their soil, surface waters, and/or groundwater

(wells) become contaminated by a release? Will the Applicant compensate the landowners for the reduced value of their property due to a contamination accident? What financial assurance will the Applicant provide the landowner and the public that ensures the site will be completely cleaned up following a release? ***The PUC must require the Applicant to document the extent of their liability following a release. This includes all cleanup and restoration costs, provisions for replacement of short-term and long-term public and private drinking water supplies, and payment to landowners of any and all damage claims associated with the release.***

In addition, small "weeping", "leaking" releases may go unnoticed until by accident someone notices it or someone gets very ill. ***How will wells that have the potential to be contaminated be monitored? This is essential to assure the landowners they are not drinking contaminated water and to ease their worries and reduce the negative effects the pipeline may have on their health; physically and mentally. The Applicant must be required to compensate landowners for the monitoring costs of their wells for as long as the pipe is in the ground.***

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MN Environmental Information Report

Surface Water Resources 9.0

Routing Permit Docket No. PL-6668/PPL-13-474
Certificate of Need Docket No. PL-6668/CN/13-473

These comments are provided by the Carlton County Land Stewards (CCLS).

9.0 Surface Water Resources

Pages 9-1 to 9-5 includes, 9.1 Major Basins and Watersheds, as well as Tables 9.1-1 Watersheds Crossed by the Sandpiper Pipeline Project Route, and Figure 9.1-1 Watersheds and Basins in the Project Area, are all at a landscape level, looking at the impacted watersheds. While this is an informative overview, its limited value to this report is in the distances the Project crosses each watershed.

9.2 Waterbody Crossings

1. In para. 1, the Applicant claims they have surveyed 93% of the waterbodies on the proposed route and will finish the remaining 7% in 2014. There has not yet been consultation with the regulatory agencies about waterbody crossing methods. We contend that until the surveys are completed, and agreement has been reached with regulators, this document is incomplete. ***Therefore the DOC and PUC should withhold approval of this document until all survey work is completed, the data has been evaluated and summarized, consultation and agreement has been reached with regulators about waterbody crossing methods, that this information is entered into this report, and ample time is provided for public comment before a recommendation is made by DOC on the route.***
2. Table 9.2-1 Summary of Waterbodies Crossed by the Sandpiper Pipeline Route provides an accounting of the number of waterbodies crossed, but does not provide the names of these waterbodies. ***Please provide the public a list in table form of all of the names (by county) of the perennial waterbodies. Intermittent waterbodies should be labeled with the name of the perennial body it flows into. Note those that are designated trout streams or trout stream tributaries (perennial or intermittent). It would also be informative to know the distance at the normal high water mark at the crossing point on each waterbody.***

9.2.1 Water Quality

1. The information in this section will be important in controlling the spread of aquatic invasive species, as well as ensuring that prevention plans to eliminate water contamination between waterbodies is thoroughly considered, including the need for sanitation of equipment working in and around infected/contaminated waters, but

also in determining the source of water to be used and discharged during hydrostatic testing. No specific details are provided in the report about how these issues will be dealt with during the Project, and there is no evidence of discussions with either the MNDNR or MPCA about these issues. ***The DOC and PUC must require the Applicant to detail procedures in this report for dealing with aquatic invasives, as well as steps to be taken to ensure invasives and other harmful agents are not spread during hydrostatic testing. The Applicant must detail their discussions with the regulatory agencies about these matters. This information must be included in this report and the public must be given ample opportunity to review and comment on these plans.***

9.2.2 Public Watercourses

1. This list partially fulfills the requests in 9.2 item 2 above, providing some of the names of the waterbodies crossed, but it does not identify the trout streams, and does not identify which waterbodies the intermittent streams flow into and whether these are trout stream tributaries. We would still like this information identified.
2. ***We very much appreciate the added detail and cooperation exhibited between the Applicant and the MNDNR on route selection for the Shell River crossing in Hubbard Co., as explained in the final paragraph.***

9.2.3 Special Designated Waterbodies

Outstanding Resource Value Waters (ORVW)

In para. 1 the Applicant says the project "will not cross or be located near any published ORVWs." In the 3rd para. it says "...however, 2013 field surveys identified a previously unknown calcareous fen associated with the Hill River drainage (approximately MP 356.2) that would be crossed by the proposed pipeline route. In coordination with the MNDNR, NDPC met with specialist from the Division of Ecological and Water Resources in September 2013 to verify the fen boundaries and discuss possible route alternative to avoid disturbance to the fen. NDPC will continue to consult with the MNDNR regarding this fen. Was a reroute proposed; where is it, what other mitigation options were discussed; will there be long term impacts to this rare bio-geologic feature? ***Therefore, DOC must request that the Applicant provide some level of detailed discussion about the resolution of this issue for the public, the DOC and the PUC, and include this information into a revised version of this report. Then allow ample time for public review and comment. This will allow the DOC and PUC to make an informed decision on the selection of the route.***

Wild and Scenic Rivers

This section provides some general background in the National Rivers Inventory (NRI) of which there are four crossed by the Project. The report says the Applicant initiated

consultation with the NPS, and that river crossings will be coordinated with the MNDNR. It does not provide any details as to the important points of these discussions, so there is little for the public to comment upon, and nothing for the DOC and PUC to consider in making a route selection. ***The DOC and PUC must request additional details about the issues, plans, and mitigations strategies to be implemented, and these must be provided in the report, and the agencies and the public must be given ample time to review and comment on these plans before a routing decision can be made.***

State Boat/Canoe Routes

This para. states that there are 5 waterbodies crossed by the Project that are state-designated canoe and boat routes, and that the Applicant is in consultation with the MNDNR regarding appropriate crossing plans. No other information is provided, therefore it is difficult to know what impacts the Project will have on the waterbodies, and whether any MNDNR facilities will be impacted by the Project. ***The DOC and PUC should seek additional details from the Applicant about any foreseeable impact, and whether any MNDNR facilities will be impacted. This information should be entered into the report, and the public should be given an opportunity to review and comment on this information before a decision is made on the route of the Project.***

9.2.4 Waterbody Construction Method

The opening para. provides a general description of the waterbody crossing methods, and says that the Applicant is still evaluating the crossing plans based on results of environmental, civil, and geotechnical surveys, and it will continue to consult with the MNDNR on their crossing plans. This sounds preliminary, and lacks the specificity and detail that should be part of this plan. ***We would urge the DOC and PUC to request that once the Applicant has these details finalized, that they then provide them for this report, and allow the DOC, PUC and the public ample time to review and comment on the report before making a decision on the route.***

Clearing and Grading

Depending on the topography at the crossing, the setback for the additional workspace may need to be further than the 50 ft stated in the report. Large rivers with one or more benches may require 100-200 ft or more for the setback, but these ***temporary workspaces should never be closer than the top of the slope. This will minimize soil disturbance on the steeper slopes leading down to the waters edge.***

Temporary Equipment Bridges

1. We are not familiar with installation of equipment bridges, so the thought of running a large piece of equipment through a stream bed prior to installation of the bridge sounds like the hard way, and may do a lot of damage to the waterbody. It would

seem reasonable to clean one side of the bank, and using a large tracked backhoe or crane, to lift and place the bridge long enough to allow the clearing equipment to safely cross and clear the vegetation on the far bank. At that point, a more permanent (for as long as it's needed for the Project) installation can be completed. This would keep the equipment out of the waterbody. NDPC, their engineers, and their contractors need to carefully evaluate each stream crossing before attempting to execute this procedure, so that worker safety and the health of the stream are not jeopardized by an in-stream accident.

2. All temporary bridges must be secured to shore at one end to prevent temporary dislodging during high water events.

Trenching and Installation

Open-top trenching method is use infrequently, and only at locations where the waterbody has a lower environmental quality, such as legal ditches, non-trout stream tributaries, etc. This method should not be used in high quality waterbodies, such as trout streams.

Dam and Pump Method

Though more difficult to do, this method is preferred for as many waterbodies as possible, since it reduces environmental damage to the waterbody as much as possible.

Flume Method

From the description of this method it's a little unclear if the downstream end of the flume is placed back in the stream channel or if it is simply laid on the nearby stream bank. If it is on the bank, is there a method of preventing erosion of the bank?

Horizontal Directional Drilling Method (HDD)

1. This method sounds very intriguing and hopefully is successful in minimizing impacts to the waterbody. The Straight River, a designated trout stream, is a good example of where it may be used. We would like to see this method considered on the Blackhoof, another trout stream (not found in Table 9.24-1). But apparently the geology is not appropriate at that crossing. ***If for some reason the route shifts where it crosses the Blackhoof, then this option should be reconsidered and used if appropriate to the site.***
2. According to this report geotechnical evaluations are ongoing for those waterbodies under consideration for use of the HDD method. It also says alternate plans will be developed for those crossings that have inappropriate soils for this method. ***These alternate plans should be formulated once it is known that HDD cannot be used at an intended site, and these plans should be provided to the DOC, PUC and the public, and there should be ample time to review and comment on these alternate plans before the final route is selected.***

Restoration and Revegetation

1. Why would restoration of stream banks take place before dam and flume removal? It would seem that the process of removing these devices may cause disturbance to the area already restored.
2. The removal of temporary erosion control devices made of artificial material is appropriate. Those made of bio-degradable materials such as straw bales could be left in place. Removal of these devices is sometimes quite problematic, because they may become buried or partially buried with sediment. In those cases the environment may be better served by leaving them in place.

9.2.5 General Construction and Operation Impacts and Mitigation

1. In-stream pipeline installation is known to cause short and long-term sedimentation, which can have significant negative impacts on many forms of aquatic life. The cleared ROW will also contribute negatively to water quality through increased sedimentation during construction, as the site revegetates, and even after revegetation, but also because of possible changes in shoreline vegetation type. Many of the water quality problems associated with the permanent installation of a pipeline in the waterbody will be permanent as well. These impacts will be particularly hard on the more sensitive cold-water trout streams. Methods to mitigate and restore will only be marginally effective, and problems could be exacerbated by untimely, severe rainfall events that increase erosion and sedimentation. Or the opposite may happen, as drought could limit the success of revegetation, prolonging the exposure of bare soil and leaving it vulnerable to wind erosion, or to sudden downpours that would contribute large sediment loads to the waterbody. ***There is an active step that the Applicant could take to more quickly reestablish vegetation along waterbodies during times of drought. That step is to lightly irrigate to ensure that new vegetation becomes established more quickly and more densely, thus reducing sediment loading in the stream.***
2. In the final para. it states that releases from refueling operations or fuel storage in or near the waterbody, could effect aquatic resources. ***There should be no refueling or fuel storage sites anywhere near the waterbody. Refueling and fuel storage should be a safe distance away from all waters and unfrozen wetlands.***

9.2.6 Hydrostatic Testing

1. The report lists several sources of water for the hydrostatic testing. However, there is no discussion of the volume of water needed for the test. Depending on the availability of large local water sources, it would seem that, when available, surface water sources are preferable to groundwater sources. Care in choosing surface water sources that are free of invasive species should be the standard. In that way if

a pipe were to have a release near another waterbody, there would be a reduced potential for biological contamination by an invasive species. Also, it should be the standard that all water removed from a waterbody, goes directly back to that waterbody. In that way, any as yet undetected invasive species will be recycled back to the same waterbody, and will not be released into a new environment. ***Once the Applicant has selected the water supply sources to be used for hydrostatic testing, and following completion of the site-specific discharge plans, the information should be added to this report, and the DOC, PUC and public should be given ample time to review the plans and provide public comment, prior to the approval of the routing permit.***

9.3 Wetland Crossings

It's encouraging to see that the Applicant has a stated commitment for avoidance and minimization of impact on wetlands. It's also good to see that they are working cooperatively with the USACE, MNDNR, BSWR and local government units to secure all the necessary permitting. ***It would be helpful to know what additional issues have been raised, what potential solutions are being considered, what mitigation strategies will be implemented as a result of these discussions. The public should be provided with the details of these discussions, and be given an opportunity to provide reasonable public comment on them before the route is selected.***

9.3.1 Existing Wetland Resources

1. In reading the first para., we see that the wetlands delineations have not yet been completed for the Project. Therefore the data in the report is also not yet complete. ***We urge the DOC to wait until all survey work is complete, the data analyzed and complied, and a new report provided before offering a recommendation on the route to the PUC. The public should also be given an opportunity to review and analyze the data, and provide timely, informed comment on the data as it pertains to this route selection.***
2. In the para. just above Table 9.3.1-2 there is an incomplete listing of the plant species found in the wetland types. A more thorough list is probably available from the MNDNR Ecological and Water Resources Office, based on the County Biological Survey data. This list will better represent the rich diversity of species found in northern Minnesota's wetlands, ranging from the common to the rare. ***The Applicant should acquire a complete listing of wetland plants found along the route of the proposed Project. This list should be added to this chapter and then provided to the DOC, and it must be made available for public review and comment prior to selection of a route.***
3. For the benefit of the lay public, a Table describing, or photos illustrating the wetland classifications types, should be inserted into the report directly ahead of or just

behind Table 9.3.1-2. Otherwise this Table will be difficult for the public to understand, and will lose its purpose.

9.3.2 Public Water Wetlands

There is no mention in the report that the Applicant has discussed these marsh and pond crossings with the MNDNR. If discussion were held, there should be ***a report on the topics discussed, possible route changes suggested and considered, impact mitigation strategies discussed, and implementation plans developed. This information should be provided to the DOC as well as the public, and ample time should be given to allow for review and public comment before a route is selected.***

9.3.3 Wetland Construction Methods

Clearing and Grading

There is no mention of utilization of the woody materials, just that "Trees, shrubs, and stumps that are removed will be disposed of properly outside wetlands." We would hope this material is put to good use as bio-fuel, timber for the forest products industry, or turned into chips to be sold.

Trenching and installation

There is no mention of the disposition of excess backfill that is left on the uplands. It should not be abandoned there. Will it be utilized elsewhere on the project? Will it be spread and revegetated? If not, will it lead to erosion and sedimentation? Is the Applicant responsible for disposal if the landowner does not want it left on their land? ***The disposal of excess backfill must be addressed in this plan and the public must be given an opportunity to comment on this disposal.***

Cleanup and Revegetation

Besides the seed list provided by NRCS, there are other seed list options, including those developed by BSWR and the MNDNR. Very likely is there considerable overlap in the lists, but there may be unique mixes that could be used in some circumstances.

9.3.4 General Construction and Operation Impacts and Mitigation

1. The first para. states:

> "Based on review of NWI data, (MNDNR, 2013e) in conjunction with field data collected through 2013, a total of 874 wetlands will be crossed by the Project in Minnesota. Pipeline construction across these wetlands will result in temporary impacts on approximately 929.4 acres as determined by totaling the acreages within the construction workspace and additional temporary workspace. This number overestimates wetland impacts as it does not account for NDPC's plans to reduce the construction to 95 feet in wetlands in areas that have not yet been

surveyed, and to further evaluate workspace footprints. A summary of wetlands affected during construction is provided in Table 9.3.1-2."

We disagree with this, because there is ample evidence to the contrary, that pipeline construction projects have impacts in wetlands well beyond the limits of the construction ROW. In many wetlands, the pipeline creates a dam, which leads to ponding of water on one side of the pipeline, and it denies water to the wetland on the other side. This can impact hundreds or thousands of acres beyond the ROW. Simply looking at an aerial photo of the Applicants Mainline as it passes thru the Fond du Lac State Forest north of Dead Fish Lake (T49-R19) provides clear evidence of it's impacts. ***The DOC needs to look at wetland impacts as something that doesn't stop at the edge of the ROW, because it extends out well beyond that zone. This must be factored into the routing decision, with a comparison of the impacts along the existing ROW, the Northern Route Alternative, or the creation of a new ROW that would inject impacts to all new wetlands.***

2. The 2nd para. says there will be temporary impacts, with some minor changes in plant species composition. Again, we disagree with this idea. There will be major impacts to hydrology and biology, including a complete change in vegetation. As stated by the Applicant, there will be no timber or woody vegetation permitted on these sites. This will convert timber or shrub wetlands to sedge types. The only thing these communities would have in common is that they are still wet. But it's not a minor or temporary change. Some of these wetlands, particularly those with year-round saturated soils, like bogs, heal slowly, if ever. Aerial photos still reveal caribou trails across the bogs, over 100 years after the last caribou was extirpated from the area. These impacts will be noticeable for several centuries or longer. ***The DOC needs to look at the long term changes created by the pipeline construction. These changes cannot be mitigated, they are permanent, and they are major in scope. The only way to minimize the impacts, is to route the Project on the existing ROW, the Northern Route Alternative.***
3. The Applicant states that an additional 132 acres of I maintained ROW that was forested wetland, will be permanently converted to emergent or shrub wetland. ***There's no explanation of why this is being done.***

Comments on the Sandpiper Pipeline Proposal
MN Environmental Information Report

Cultural Resources 10.0

Routing Permit Docket No. PL-6668/PPL-13-474
Certificate of Need Docket No. PL-6668/CN/13-473

These comments are provided by the Carlton County Land Stewards (CCLS),

10.0 Cultural Resources

In the second paragraph, it says "NDPC has initiated consultations with federal, state, and local government agencies regarding the Project." Considering this issue is of prime concern to the tribes, they should be consulted by the Applicant. ***DOC and the PUC should require the Applicant to consult with the tribes on matters concerning cultural resources along the proposed Project ROW.***

10.4 General Construction and Operation Impacts and Mitigation

It says "The preferred method of mitigating impacts to historic properties, or sites treated as historic properties, is avoidance, which may include routing the pipeline around historic properties, installing the pipeline beneath historic properties using conventional bore or HDD technology, and/or fencing all or portions of historic properties to ensure that they are avoided during construction. If avoidance is not possible, mitigation measures, such as data collection recovery in the case of archeological sites, may be used." At no point does the Applicant consider the possibility of consulting with the tribes, and seeking consensus on the mitigation strategies to be considered and implemented. ***The PUC should require the Applicant to provide detailed contingency plans, mutually developed by the Applicant and the tribes, which will provide consensus on mitigation strategies and actions. Installing the pipeline underneath cultural properties by bore hole or HDD technology is not acceptable. What if the pipe needs to be dug up and repaired? What if the pipe spills hazardous materials into the soil beneath a cultural site? The site most likely would be destroyed during clean up efforts. Therefore, this is not an acceptable mitigation measure and should not be allowed.***

Comments on the Sandpiper Pipeline Proposal
MN Environmental Information Report

Federal, State and County Recreational Areas - 11.0

Routing Permit Docket No. PL-6668/PPL-13-474
Certificate of Need Docket No. PL-6668/CN/13-473

These comments are provided by the Carlton County Land Stewards (CCLS).

11.1 Existing /designated Recreational Areas

1. The Applicant refers to numerous federal facilities that it won't cross. The fact that these are absent from the landscape is irrelevant to this report.
2. After listing facilities that aren't found on the landscape, the Applicant lists many sites on federal, state and county lands that will be impacted. This is a more meaningful statement, though it is very generic and lacks detail. Therefore, the PUC must direct the Applicant to provide more information relating to these recreational areas, what impacts are expected, and other details for review and comment.

11.1.1 Federally Designated Recreation Areas and Trails

1. After listing the North Country Trail, a National Scenic Trail, it goes on to say, "NDPC initiated consultation with NPS and North Country Trail Association regarding this crossing. Because the Trail is on county-owned land, NDPC will also consult with Hubbard County to minimize impacts on the trail." This statement provides no insight into the discussions had with any of these organizations, including any analysis of the impacts the Project would have on the Trail, other issues raised, strategies formed and mitigations identified to deal with these impacts and issues, and whether resolution was reached on the issues. ***Therefore, the PUC must direct the Applicant to disclose these discussions with each of the involved organizations, detailing the issues and mitigation strategies that will be incorporated into these plans to deal with impacts, and then allow the public and these organizations another opportunity to examine the issues and strategies in this document and provide public comment. Until the public has that opportunity, the PUC must withhold approval of this document.***
2. The second paragraph, like the first, is only a list of the rivers crossed by the Project that are on the NRI. There is "consultation with the NPS" but no details about this discussion. Nor is there any disclosure on discussions with the MNDNR of the PWI watercourses. ***Therefore, the PUC must direct the Applicant to disclose these discussions with each of the involved organizations, detailing the issues and mitigation strategies that will be incorporated into these plans to deal with impacts, and then allow the public and these organizations another opportunity to examine the issues and strategies in this document, and***

provide public comment. Until the public has that opportunity, the PUC must withhold approval of this document.

11.1.2 State-Designated Recreation Areas

State Parks and Forest Land

1. There are no State Parks Lands.
2. "NDPC has initiated consultation with MNDNR regarding state land crossings and understands routes passing through school trust lands must produce maximum long-term economic return for the Trust. NDPC will continue to work with MNDNR to permit any crossings of state land." Although it says very little, it's a slight improvement over the previous statements, in that we know one issue being discussed, economic return to the Trust. However, there are likely other issues being discussed, and these issues and impacts, and potential strategies for resolving these problems should be detailed in this report, and not left to the public's imagination. ***Therefore, the PUC must direct the Applicant to disclose these discussions with the MNDNR, detailing the issues and mitigation strategies that will be incorporated into these plans to deal with impacts, and then allow the public another opportunity to examine the issues and strategies in this document and provide public comment. Until the public has that opportunity, the PUC must withhold approval of this document.***
3. In table 11.1.2-1 it lists in Hubbard County "Unidentified State Forest Land". As a retired DNR Forester, I'm confused by this term. Lands are either in a State Forest and are identified as State Forest Land, or they are lands Outside the State Forest. But they are never "Unidentified". ***The Applicant needs to clarify this term, and properly label the lands in this category.***
4. The MNDNR Div. of Forestry has substantive planning and documentation for each stand of timber it owns. A display of this data, showing the stand number, along with stand attribute data, should be request from the MNDNR and published by the Applicant in this document. The public should then be given the opportunity to review this dataset and provide comment. ***The PUC must require that the Applicant request a complete dataset from the MNDNR Resource Assessment Unit, develop tables and maps to display the information, and allow the public to review this data as part of this document, and provide comments on the impacts to these lands. Until this is done, the PUC should delay approval of this document.***

State Wildlife Management Area, Scientific and Natural Areas, and Aquatic Management Areas

1. In the first para. the Applicant lists the WMAs impacted by the Project. They make generalized statements about co-location with existing rights-of-way (ROW) through Crow Wing Chain and Lawler WMAs. But there is no detail of what type of ROW

exists, and what impacts a larger ROW may have on the primary mission of these lands, and what discussions the Applicant may have had with the MNDNR on this planned Project. It goes on to say the Project deviates from the existing ROW in Salo Marsh WMA to avoid a large wetland complex. Was this deviation suggested by the MNDNR, was the MNDNR consulted on this before a decision was made, and what impacts would each of the routes (following the existing ROW vs creation of a new ROW) have on the landscape? The document goes on to say that at Grayling Marsh WMA the Project crosses a Greenfield,establishing an entirely new ROW. Why? No explanation. So, what are the impacts of this decision? What alternatives were discussed? The lack of detail provided in the document in all these decisions again leaves the public with little or nothing substantive to comment on. ***The PUC must require more detailed information from the Applicant, and then allow reasonable time for public comment on these decisions, before approving this plan. The public and the PUC are entitled to "see their work", not just have the Applicant's pre-permit decisions.***

2. Because of the lack of detail in this document, the crossing of the Project at Spire Valley Hatchery AMA is highly problematic. Spire Valley has assumed increased responsibility for raising the state's coldwater trout and salmon. Any release that impacts water quality at this facility could have devastating impacts on the fish stocks and infrastructure for many years. There is no discussion about impacts on water quality and quantity, including water temperature changes following ROW cleaning in the immediate watershed and the impacts that a warm pipeline will have on surface water or groundwater supplied at the hatchery. ***The PUC must require that the Applicant furnish additional details about the route at this site, discuss rigorous contingency plans for dealing with construction and ongoing utilization of a ROW there, impacts of a release at this location, and provide the public and PUC with sufficient details of discussions with the MNDNR that insure that this facility will not in any way be compromised or impacted by construction and ongoing utilization of this site, or from a release in that watershed anywhere upstream from the facility. Until the public and PUC have had time to review these plans and provide comment, this document should not be approved.***

State-Designated Trails and Canoes and Boating Routes

The report lists a number of important rivers the Project crosses, including the Mississippi twice, the Red River of the North, Red Lake River twice, the Pine River, and Crow Wing River. It also says, "NDPC initiated consultation with the MNDNR and Mississippi Headwaters Commission regarding these waterbody crossings." Again, no detail is provided about these consultations, so the public has little to comment on other than the list of rivers provided in the document. ***The PUC must require that the Applicant furnish additional details about the route at theses sites, discuss rigorous contingency plans***

for dealing with construction and ongoing utilization of a ROW there, impacts of a release at this location, and provide the public and PUC with sufficient details of discussions with the MNDNR that insure that these rivers will not in any way be compromised or impacted by construction and ongoing utilization of this site, or from a release in that watershed. Until the public and PUC have had time to review these plans and provide comment, this document should not be approved.

11.1.3 County –Designated Recreation Areas

County Park and Forest Land

The report states there are four parks impacted by the Project, and 41 miles of County Forest Lands in seven counties. The report only reports that "NDPC initiated consultation with each county to minimize impacts on these lands." This description of the impacts, the locations of the impacts, the strategies to minimize the impacts, and any ongoing discussions between the counties and the Applicant are missing from this report. ***The PUC must require the Applicant to provide more robust, detailed information that answers these questions for the public and PUC, provide an opportunity for public input on this data and these strategies, before approval of this document is given.***

11.1.4 Designated Scenic Byways

Lake Country Scenic Byway

The applicant provides no information on the impacts for the Project on the Byway, nor does it provide an analysis of the economic impacts during the construction phase on local/regional businesses that depend heavily on tourism. ***The PUC should consider whether an economic analysis is necessary, to look at short-term impacts on the regional tourist based economy.***

The Great River Road

The applicant provides no information on the impacts for the Project on the Byway, nor does it provide an analysis of the economic impacts during the construction phase on local/regional businesses that depend heavily on tourism. ***The PUC should consider whether an economic analysis is necessary, to look at short-term impacts on the regional tourist based economy.***

Veterans Evergreen Memorial Scenic Byway

The applicant provides no information on the impacts for the Project on the Byway, nor does it provide an analysis of the economic impacts during the construction phase on local/regional businesses that depend heavily on tourism. ***The PUC should consider whether an economic analysis is necessary, to look at short-term impacts on the regional tourist based economy.***

11.1.5 Other Public Lands

There are apparently a number of unidentified conservation easements in place along the Project, but there appears to have been insufficiently researched at the time this report was submitted to confirm them all. There is no table of information listing the locations by county, the types of conservation easements, nor the impacts to these easements. ***Since some of these conservation easements may have public appropriations associated with them, the PUC must request a final accounting of all these conservation easements along the Project, and display this data in table forms. There should also be discussion of what impacts, if any, the Project will have on these easements, and a financial analysis of the impacts to any public appropriations tied to these conservation easements.***

11.2 General Construction and Operation Impacts and Mitigation

The Applicant states that the Project will have no long-term impact on recreational users. This may be true, but it ignores impacts to other users of these same lands, including the loss of forest lands due to the permanent conversion of forest land to grasslands, impacts on fish and wildlife habitats from land conversion and the loss of interior forest habitats. None of this is being mitigated. The report attempts to marginalize impacts to recreational users, and never analyzes the economic impacts to local tourist based economies. ***The PUC needs to recognize that there are impacts beyond those listed in this report, and insist on a more rigorous evaluation by the Applicant and require meaningful mitigation; whether on-site or elsewhere.***

A general observation can also be made that there is a strong correlation with the Project route, and the disproportionate impact to private landowners and overall lack of public lands in this project. This intentional effort to remove public lands from a project designated as a public service utility project, and subsequently placing an inequitable burden on the private sector, seems counter to the direction such a project should follow. It greatly inhibits the right of the private landowner to the enjoyment of their land. The burden of a public service project should fall to the public lands, not to private lands. This is unfair to the tax paying public, but it also limits greater public oversight when a project is placed on public lands. It also robs the public of possible long-term financial returns available through the leasing of public lands to a public utility corporation. ***Therefore the use of public lands, located where it will do the least harm to the environment and where it will optimize various public revenue streams, should be viewed as the preferred alternative for this Project. To that end, the PUC must consider utilization of first the existing Northern Route Alternative, and second the Soo Line Grade Alternative, over the creation of a new pipeline corridor through largely privately held lands.***

Comments on the Sandpiper Pipeline Proposal
MN Environmental Information Report
Air Quality 12.0
Routing Permit Docket No. PL-6668/PPL-13-474
Certificate of Need Docket No. PL-6668/CN/13-473

These comments are provided by the Carlton County Land Stewards (CCLS).

12.0 Air Quality

Not surprisingly, the Applicant has chosen to ignore the elephant in the room, never mentioning the short-term and long-term consequences of the Project's direct and in-direct contributions of $C0_2$ gas emission on climate change. The State of Minnesota has set goals for the reduction of $C0_2$ emissions, and this report never addresses how this project will help achieve these goals. Unless these goals are taken seriously by both the Applicant and the regulators during the planning and review of such a heavily carbon based project, there is no way Minnesota will ever achieve the results emissions reduction has set in MN Statute 216H.02 (called Next Generation Energy Act) both in the short-term goal of 30% by 2025 as well as the long-term goal of 80% reduction by 2050. We are not qualified to analyze the full impact on our atmosphere of adding 711,000 bpd to the currently escalating oil production equation, but it seems clear that the Applicant's (NDPC) short-term plan to add pumping capacity to Line 67 (they're requesting to expanded pumping capacity in the Alberta Clipper from 450,000 to 800,000 bpd), eventually adding pumping capacity to a re-built Line 3 (going from 390,000 to 800,000 bpd), and then adding in the projected volume for an operational Sandpiper pipeline (ultimate pumping capacity of 711,000 bpd), will give Enbridge/NDPC a daily capacity through MN of 3,561,000 bpd or 149,562,000 gallons per day. This would be the total potential pumping capacity of Enbridge's pipelines that transport hazardous liquid materials through the Northern Mainline each day. It does not take a climate scientist to understand that the impact all this oil, with its enormous $C0_2$ emissions footprint, is going to have measurable impacts on our atmosphere over time. All our other efforts to reduce our carbon footprint in MN will be absolutely fruitless in light of this huge increase in greenhouse gases. MN does not need this oil, so at some point we need to say, enough is enough. We must not permit continued expansions of fossil fuel development, because it will negatively impact our environment for generations to come. We believe, it must stop right here. The PUC must require NDPC to address short-term and long-term consequences of the Project's direct and in-direct contributions of $C0_2$ gas emission on climate change. In addition, NDPC must provide clear information as to how much and what type of liquid hazardous materials they transport through MN so the public, DOC, and PUC can better understand what impacts may occur and be given the opportunity to comment on air quality and climate change impacts.

Comments on the Sandpiper Pipeline Proposal
MN Environmental Information Report

Environmental Protection Plan – Revegetation and Monitoring 7.0

Routing Permit Docket No. PL-6668/PPL-13-474
Certificate of Need Docket No. PL-6668/CN/13-473

These comments are provided by the Carlton County Land Stewards (CCLS).

7.1 Project Seed Specifications

1. This pipeline will pass through several biomes, from prairies in the west to sub-boreal forest in the east. Seed mixes also need to match soils types and drainage, slope and aspect, as well as landowner preferences. Seed mixes need to reflect this, and should change along the project to match the surrounding vegetation. There are alternative seed mixes developed by MN DOT, BWSR, and the MN DNR that reflect these changing biomes. For more information see the MN DOT website and search for "Seed Mixes", where a full list of seed mixes, guidelines about functions and intended planting areas are available. If the standard mixes fail to meet site needs, visit the manual "Native Seed Mix Design for Roadsides". (see attached Exhibit 5)
2. Seed mixes using native species should be used whenever possible. And use of any seed mix with reed canary grass (a listed invasive species) must be excluded, unless specifically requested by a landowner for agricultural purposes.

8.0 Winter Construction

It is confusing about the steps being taken in paragraph 1, particularly the last 2 sentences. The surface would need to be carefully separated from the subsoil layer, so subsoil layers are not included in the topsoil is clear. It then appears the topsoil is removed to the "spoil storage area", whatever that is, and is "graded smooth to minimize mixing during backfilling." How would grading smoothing the topsoil at a remote site (spoil storage area) minimize mixing during backfilling? It then says, "Sufficient time is needed to allow the newly graded topsoil to freeze in place prior to trenching." Why would they want to trench through newly graded and smoothed topsoil? ***This needs further explanation and a greater level of detail to be meaningful.***

9.0 Waste Management

In paragraph 2, sentence two, it says "On a routine basis, the Contractor will remove the containers of waste from the site and properly dispose of them." It should say, "...and properly dispose of them as required by law, statute, or other regulation, and provide NDPC, all regulators and the landowners with a copy of documentation of proper disposal."

Documentation must be provided that the waste was actually disposed of properly, and not improperly buried somewhere along the ROW.

9.1 Hazardous Wastes

NDPC has made the Contractor the responsible party for proper disposal of hazardous waste, and for cleanup of any "release". There is no statement here that NDPC is ultimately responsible for all actions on the job site. ***NDPC can direct their Contractors to properly dispose of hazardous waste, and to have their Contractors clean up any releases, but NDPC must ultimately be responsible for all actions taken by their Contractors, and they can not absolve themselves of this responsibility, except when the Contractor is acting on their own behalf in violating the law.***

EXHIBIT 5

STATE SEED MIXES

Standard seed mixtures used by MnDOT, BWSR, and some divisions of the DNR have been revised and consolidated into one list of State Seed Mixes. Standards for the mixes have also been combined, with both BWSR and MnDOT requiring that mixes be sold as pure live seed (PLS). Source Identified (Yellow Tag) when available, and specific labeling requirements. Requirements for local origin seed will vary depending on the project goals and seed availability.

Mixes are available to meet the most commonly encountered erosion control and restoration needs.*

Seed mix numbers provide information about the use and content of the mix. This numbering system can be used to guide the user in choosing the right mix for a given project. A full list of the State Seed Mixes and guidelines about their function and intended planting areas will be soon be available on the MnDOT website by searching for "Seed Mixes."

*If one of the standard mixes does not meet the requirements of a particular project, the manual Native Seed Mix Design for Roadsides will provide an easy method for creating a custom mix.

Numbering System for State Seed Mixes

The following table shows how mixes are numbered according to native/nonnative species, function, intended planting area, required hydrology, and version. This table can be used to select a suitable mix for a given project.

Native/Nonnative	Function	Planting Area	Hydrology	Version
10,000 Hybrid	1,000 Cover Crop	100 statewide	10 general	1-9
20,000 Introduced	2,000 Mid Term Stabilization	200 South 1/2 & West 1/3	20 dry	1-9
30,000 Native	3,000 Stormwater Facilities	300 NE & North-central	30 dry mesic	1-9
40,000 Custom	4,000 Wetland	400 NW*	40 mesic	1-9
	5,000 Grassland	500 SW*	50 wet mesic	1-9
	6,000 Woodland	600 SE*	60 seasonally flooded	1-9
		700 Central**	70 saturated	1-9
			80 emergent	1-9
			90 submergent	1-9

*Use a mix for Planting Area 200 if no regional mix is available for Planting Areas 400-600.
**Use a mix for Planting Area 200 or 300 if no regional mix is available for Planting Area 700.

Example: Need a native seed mix suitable for a wetland area next to a stream in Lake County? The table would give you 34-3xx. Under hydrology, there are 9 choices, but only two are listed in the table of seed mixes available: 34-361 (Riparian NE) or 34-371 (Wet Meadow NE). Best professional judgment will be needed to determine which one is best for the project.**List of State Seed Mixes**

Guidance on functions and intended planting area for each mix will be available on the MnDOT web page by searching for "Seed Mixes."

CATEGORY NUMBER	PLS Rate	NAME	REPLACES
Cover Crop			
21-111	100	Oats Cover Crop	MNDOT 110, BWSR UT1
21-112	100	Winter Wheat Cover Crop	MNDOT 100
21-113	110	Soil Building Cover Crop	MNDOT 130
Mid-Term Stabilization			
22-111	30.5	Two-year Stabilization	MNDOT 150
22-112	40.0	Five-year Stabilization	MNDOT 190
Non-Native Grassland			
25-121	61.0	Sandy General Roadside	MNDOT 240
25-131	220	Low Maintenance Turf	MNDOT 260
25-141	59	Mesic General Roadside	MNDOT 250
25-142	45	Agricultural Roadside	MNDOT 280
25-151	120	High Maintenance Turf	MNDOT 270
Mid-term Stabilization Native			
32-241	38	Native Construction	BWSR U12, BWSR U11
Stormwater Facilities			
33-281	35	Stormwater South and West	MNDOT 318 & 328
33-282	44	Dry Swale / Pond	BWSR W4
33-361	35	Stormwater Northeast	BWSR W7, MNDOT 310 & 328
Wetland			
34-171	5.3	Wetland Rehabilitation	BWSR WT3
34-181	5	Emergent Wetland	BWSR W1
34-281	31.5	Riparian South & West	BWSR R1
34-282	14.5	Wet Prairie	BWSR W3, MNDOT 325
34-271	12	Wet Meadow South & West	BWSR W2
34-361	31.5	Riparian Northeast	BWSR R1
34-371	12.5	Wet Meadow Northeast	BWSR W2N
Native Grassland			
35-221	36.5	Dry Prairie General	MNDOT 330
35-241	36.5	Mesic Prairie General	MNDOT 350
35-421	11	Dry Prairie Northwest	BWSR U2
35-441	11	Mesic Prairie Northwest	BWSR U1
35-531	12.5	Dry Prairie Southwest	BWSR U4
35-541	12	Mesic Prairie Southwest	BWSR U3
35-621	11	Dry Prairie Southeast	BWSR U6
35-641	12	Mesic Prairie Southeast	BWSR U5
Woodland			
36-211	34.5	Woodland Edge South & West	BWSR U7
36-311	33.5	Woodland Edge Northeast	BWSR U13, BWSR U14
36-411	35.5	Woodland Edge Northwest	
36-711	35.5	Woodland Edge Central	

21-111 Oats Cover Crop

Common Name	Scientific Name	Rate (kg/ha)	Rate (lb/ac)	% of Mix (% by wt)	Seeds/ sq ft
Oats	*Avena sativa*	112.08	100.00	100.00%	44.54
	Totals:	**112.08**	**100.00**	**100.00%**	**44.54**
Purpose:	Temporary cover crop for spring and summer plantings				
Planting Area:	Statewide				

21-112 Winter Wheat Cover Crop

Common Name	Scientific Name	Rate (kg/ha)	Rate (lb/ac)	% of Mix (% by wt)	Seeds/ sq ft
Winter Wheat	Triticum aestivum	112.09	100.00	100.00%	20.08
	Totals:	112.09	100.00	100.00%	20.08
Purpose:	Temporary cover crop for fall plantings				
Planting Area:	Statewide				

21-113 **Soil Building Cover Crop**

Common Name	Scientific Name	Rate (kg/ha)	Rate (lb/ac)	% of Mix (% by wt)	Seeds/ sq ft
Field Pea	Pisum sativum	56.04	50.00	45.46%	3.44
	Total Forbs	56.04	50.00	45.46%	3.44
Oats	Avena sativa	67.25	60.00	54.54%	26.72
	Total Cover Crop	67.25	60.00	54.54%	26.72
	Totals:	123.29	110.00	100.00%	30.16
Purpose:	Temporary cover crop with soil building function				
Planting Area:	Statewide				

22-111 **Two-year Stabilization**

Common Name	Scientific Name	Rate (kg/ha)	Rate (lb/ac)	% of Mix (% by wt)	Seeds/ sq ft
slender wheatgrass	Elymus trachycaulus	10.09	9.00	29.50%	22.80
Perennial Ryegrass	Lolium perenne	5.04	4.50	14.76%	22.42
	Total Grasses	15.13	13.50	44.26%	45.22
Alfalfa	Medicago sativa	9.53	8.50	27.88%	44.25
Red Clover	Trifolium pratense	9.53	8.50	27.88%	53.13
	Total Forbs	19.05	17.00	55.74%	97.38
	Totals:	34.19	30.50	100.00%	142.60
Purpose:	One to two year soil stabilization with non-native species				
Planting Area:	Statewide				

22-112 **Five-year Stabilization**

Common Name	Scientific Name	Rate (kg/ha)	Rate (lb/ac)	% of Mix (% by wt)	Seeds/ sq ft
big bluestem	Andropogon gerardii	0.56	0.50	1.25%	1.63
Smooth Brome	Bromus inermis	6.73	6.00	14.99%	19.67
slender wheatgrass	Elymus trachycaulus	2.24	2.00	5.01%	5.08
Perennial Ryegrass	Lolium perenne	15.13	13.50	33.75%	67.25
	Total Grasses	24.66	22.00	55.00%	93.63
Alfalfa	Medicago sativa	9.53	8.50	21.25%	44.25
Alsike Clover	Trifolium hybridum	3.92	3.50	8.75%	54.70
Red Clover	Trifolium pratense	6.15	5.50	13.74%	34.39
American vetch	Vicia americana	0.56	0.50	1.26%	0.34
	Total Forbs	20.16	18.00	45.00%	133.68
	Totals:	44.83	40.00	100.00%	227.31
Purpose:	Two to five year soil stabilization with non-native species				
Planting Area:	Statewide				

25-121 **Sandy General Roadside**

Common Name	Scientific Name	Rate (kg/ha)	Rate (lb/ac)	% of Mix (% by wt)	Seeds/ sq ft
Smooth Brome	Bromus inermis	8.97	8.00	13.12%	26.25
slender wheatgrass	Elymus trachycaulus	2.24	2.00	3.29%	5.08
Hard fescue	Festuca trachyphylla	4.76	4.25	6.96%	55.10
Perennial Ryegrass	Lolium perenne	15.13	13.50	22.13%	67.25
Park Kentucky bluegrass	Poa pratensis Park	17.93	16.00	26.23%	510.50
Canada bluegrass	Poa compressa	8.69	7.75	12.70%	425.50
switchgrass	Panicum virgatum	1.68	1.50	2.46%	7.13
little bluestem	Schizachyrium scoparium	1.68	1.50	2.46%	8.28
sand dropseed	Sporobolus cryptandrus	1.68	1.50	2.45%	110.00
	Total Grasses	62.77	56.00	91.85%	1215.69
purple prairie clover	Dalea purpurea	0.56	0.50	0.82%	2.75
Red Clover	Trifolium pratense	5.04	4.50	7.33%	28.13
	Total Forbs	5.60	5.00	8.20%	30.88
	Totals:	68.37	61.00	100.00%	1246.57
Purpose:	General non-native roadside for dry or sandy soils				
Planting Area:	Statewide. Well suited for Pine Moraines & Outwash Plains, Mille Lacs Uplands, and Anoka Sand Plain subsections. MnDOT District 3A and eastern 3B				

25-131 **Low Maintenance Turf**

Common Name	Scientific Name	Rate (kg/ha)	Rate (lb/ac)	% of Mix (% by wt)	Seeds/ sq ft
Low Maintenance Kentucky bluegrass	Poa pratensis Low Maintenance	40.35	36.00	18.36%	1148.70
Sheep Fescue	Festuca ovina	28.02	25.00	11.37%	354.22
red fescue	Festuca rubra	71.73	64.00	29.09%	657.00
Chewing's Fescue	Festuca rubra ssp. commutata	49.32	44.00	20.00%	458.60
Hard fescue	Festuca trachyphylla	33.63	30.00	13.64%	389.10
Perennial Ryegrass	Lolium perenne	23.54	21.00	9.54%	194.60
	Totals:	246.59	220.00	100.00%	3072.22
Purpose:	Salt, shade and drought tolerant turfgrass. Requires less frequent mowing and less fertilization than conventional turfgrass.				
Planting Area:	Statewide				

25-141 **Mesic General Roadside**

Common Name	Scientific Name	Rate (kg/ha)	Rate (lb/ac)	% of Mix (% by wt)	Seeds/ sq ft
Smooth Brome	Bromus inermis	8.69	7.75	13.14%	25.42
slender wheatgrass	Elymus trachycaulus	2.24	2.00	3.40%	5.08
Perennial Ryegrass	Lolium perenne	14.85	13.25	22.46%	66.00
Park Kentucky bluegrass	Poa pratensis Park	17.65	15.75	26.69%	502.50
Canada bluegrass	Poa compressa	8.41	7.50	12.71%	412.00
switchgrass	Panicum virgatum	1.68	1.50	2.54%	7.10
Tall bluegrass	Poa palustris	4.48	4.00	6.78%	191.00
Timothy	Phleum pratense	1.96	1.75	2.97%	49.50
	Total Grasses	59.97	53.50	90.69%	1259.20
Alfalfa	Medicago sativa	3.92	3.50	5.92%	18.20
White Clover	Trifolium repens	2.24	2.00	3.39%	32.10
	Total Forbs	6.16	5.50	9.31%	50.90
	Totals:	66.13	59.00	100.00%	1310.10
Purpose:	General non-native mix for roadsides with mesic soils.				
Planting Area:	Statewide				

25-142 **Agricultural Roadside**

Common Name	Scientific Name	Rate (kg/ha)	Rate (lb/ac)	% of Mix (% by wt)	Seeds/ sq ft
Pavl bluegrass	*Poa palustris*	6.73	6.00	13.33%	286.58
Smooth Brome	*Bromus inermis*	8.69	7.75	17.23%	25.43
Slender wheatgrass	*Elymus trachycaulus*	2.24	2.00	4.45%	5.08
Perennial Ryegrass	*Lolium perenne*	15.13	13.50	30.00%	67.25
switchgrass	*Panicum virgatum*	1.68	1.50	3.33%	7.70
Timothy	*Phleum pratense*	1.96	1.75	3.89%	49.43
	Total Grasses	**36.43**	**32.50**	**72.23%**	**441.39**
Alfalfa	*Medicago sativa*	14.01	12.50	27.77%	65.07
	Total Forbs	**14.01**	**12.50**	**27.77%**	**65.07**
	Totals:	**50.44**	**45.00**	**100.00%**	**506.46**
Purpose:	General non-native roadside for areas that will be cut for hay.				
Planting Area:	Statewide				

25-151 **High Maintenance Turf**

Common Name	Scientific Name	Rate (kg/ha)	Rate (lb/ac)	% of Mix (% by wt)	Seeds/ sq ft
red fescue	*Festuca rubra*	10.76	9.60	8.00%	100.10
Perennial Ryegrass	*Lolium perenne*	22.87	20.40	17.00%	101.65
Elite Kentucky bluegrass	*Poa pratensis Elite*	33.63	30.00	25.00%	957.30
Low Maintenance Kentucky blue-grass	*Poa pratensis Low Maintenance*	33.63	30.00	25.00%	957.30
Park Kentucky bluegrass	*Poa pratensis Park*	33.63	30.00	25.00%	957.30
	Totals:	**134.50**	**120.00**	**100.00%**	**3073.65**
Purpose:	Conventional turfgrass. Not salt, shade or drought tolerant. Requires more mowing, fertilizer and water than the low maintenance turf mix.				
Planting Area:	Statewide				

32-241 **Native Construction**

Common Name	Scientific Name	Rate (kg/ha)	Rate (lb/ac)	% of Mix (% by wt)	Seeds/ sq ft
big bluestem	*Andropogon gerardii*	1.40	1.25	3.30%	4.60
side-oats grama	*Bouteloua curtipendula*	1.12	1.00	2.64%	2.21
fringed brome	*Bromus ciliatus*	1.57	1.40	3.69%	5.67
bottlebrush wild rye	*Elymus canadensis*	2.24	2.00	5.28%	3.82
slender wheatgrass	*Elymus trachycaulus*	2.80	2.50	6.57%	6.33
Virginia wild rye	*Elymus virginicus*	2.24	2.00	5.26%	3.09
switchgrass	*Panicum virgatum*	0.84	0.75	1.97%	3.85
Pavl bluegrass	*Poa palustris*	0.67	0.60	1.57%	28.50
Indian grass	*Sorghastrum nutans*	1.12	1.00	2.63%	4.40
	Total Grasses	**14.01**	**12.50**	**32.89%**	**62.47**
Canada tick trefoil	*Desmodium canadense*	0.08	0.07	0.20%	0.14
partridge pea	*Chamaecrista fasciculata*	0.30	0.27	0.72%	0.27
wild bergamot	*Monarda fistulosa*	0.02	0.02	0.04%	0.38
black-eyed susan	*Rudbeckia hirta*	0.10	0.09	0.23%	3.00
hoary vervain	*Verbena stricta*	0.06	0.05	0.13%	0.53
	Total Forbs	**0.56**	**0.50**	**1.32%**	**4.31**
Oats	*Avena sativa*	28.02	25.00	65.79%	11.14
	Total Cover Crop	**28.02**	**25.00**	**65.79%**	**11.14**
	Totals	**42.59**	**38.00**	**100.00%**	**77.91**
Purpose:	Mid-term soil stabilization using native species. Also suitable for sides of agricultural drainage ditches or low-diversity mesic prairie planting.				
Planting Area:	Tallgrass Aspen Parklands, Prairie Parkland, and Eastern Broadleaf Forest Provinces. MnDOT Districts 2(west), 3B, 4, Metro, 6, 7 & 8.				

33-261 **Stormwater South & West**

Common Name	Scientific Name	Rate (kg/ha)	Rate (lb/ac)	% of Mix (% by wt)	Seeds/ sq ft
big bluestem	*Andropogon gerardii*	2.24	2.00	5.72%	7.35
fringed brome	*Bromus ciliatus*	2.24	2.00	5.72%	8.10
bluejoint	*Calamagrostis canadensis*	0.07	0.06	0.18%	6.40
slender wheatgrass	*Elymus trachycaulus*	1.12	1.00	2.85%	2.53
Virginia wild rye	*Elymus virginicus*	1.68	1.50	4.28%	2.31
switchgrass	*Panicum virgatum*	0.43	0.38	1.07%	1.93
Pavl bluegrass	*Poa palustris*	1.19	1.06	3.03%	30.70
Indian grass	*Sorghastrum nutans*	0.13	0.12	0.36%	0.55
prairie cordgrass	*Spartina pectinata*	0.43	0.38	1.07%	0.93
	Total Grasses	**9.53**	**8.50**	**24.29%**	**60.78**
sell-fruited sedge	*Carex stipata*	0.28	0.25	0.71%	3.10
dark green bulrush	*Scirpus atrovirens*	0.21	0.19	0.54%	31.70
woolgrass	*Scirpus cyperinus*	0.07	0.06	0.18%	39.00
	Total Sedges and Rushes	**0.56**	**0.50**	**1.43%**	**73.80**
Canada anemone	*Anemone canadensis*	0.08	0.07	0.19%	0.20
marsh milkweed	*Asclepias incarnata*	0.12	0.11	0.32%	0.20
leafy beggarticks	*Bidens frondosa*	0.12	0.11	0.31%	0.20
flat-topped aster	*Doellingeria umbellata*	0.07	0.06	0.17%	1.59
spotted Joe pye weed	*Eutrochium maculatum*	0.07	0.06	0.18%	2.19
autumn sneezeweed	*Helenium autumnale*	0.15	0.13	0.38%	5.97
obedient plant	*Physostegia virginiana*	0.08	0.07	0.21%	0.30
tall coneflower	*Rudbeckia laciniata*	0.08	0.07	0.21%	0.37
New England aster	*Symphyotrichum novae-angliae*	0.08	0.07	0.19%	1.56
blue vervain	*Verbena hastata*	0.06	0.05	0.15%	1.85
golden alexanders	*Zizia aurea*	0.22	0.20	0.56%	0.79
	Total Forbs	**1.12**	**1.00**	**2.85%**	**15.13**
Oats	*Avena sativa*	28.02	25.00	71.43%	11.14
	Total Cover Crop	**28.02**	**25.00**	**71.43%**	**11.14**
	Totals:	**39.23**	**35.00**	**100.00%**	**160.45**
Purpose:	Stormwater pond edges, temporarily flooded dry ponds, and temporarily flooded ditch bottoms.				
Planting Area:	Tallgrass Aspen Parklands, Prairie Parkland, and Eastern Broadleaf Forest Provinces. MnDOT Districts 2(west), 3B, 4, Metro, 6, 7 & 8.				

33-262 **Dry Swale / Pond**

Common Name	Scientific Name	Rate (kg/ha)	Rate (lb/ac)	% of Mix (% by wt)	Seeds/ sq ft
big bluestem	*Andropogon gerardii*	1.68	1.50	3.40%	5.50
American sloough grass	*Beckmannia syzigachne*	1.68	1.50	3.42%	27.60
fringed brome	*Bromus ciliatus*	1.68	1.50	3.40%	6.05
bottlebrush wild rye	*Elymus canadensis*	4.48	4.00	9.09%	7.64
slender wheatgrass	*Elymus trachycaulus*	4.48	4.00	9.10%	10.15
Virginia wild rye	*Elymus virginicus*	2.80	2.50	5.67%	3.85
switchgrass	*Panicum virgatum*	0.45	0.40	0.91%	2.05
fowl bluegrass	*Poa palustris*	1.79	1.60	3.64%	76.50
Indian grass	*Sorghastrum nutans*	[illegible]	[illegible]	[illegible]	[illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	Total Grasses	**20.74**	**18.50**	**47.03%**	**145.94**
marsh milkweed	*Asclepias incarnata*	0.07	0.06	0.13%	0.10
purple prairie clover	*Dalea purpurea*	0.10	0.09	0.21%	0.50
Canada tick trefoil	*Desmodium canadense*	0.10	0.09	0.21%	0.19
ox-eye	*Heliopsis helianthoides*	0.10	0.09	0.20%	0.20
black-eyed susan	*Rudbeckia hirta*	0.08	0.07	0.17%	2.49
blue vervain	*Verbena hastata*	0.11	0.10	0.23%	3.50
	Total Forbs	**0.56**	**0.50**	**1.15%**	**6.98**
Oats	*Avena sativa*	28.02	25.00	56.82%	11.14
	Total Cover Crop	**28.02**	**25.00**	**56.82%**	**11.14**
	Totals:	**49.32**	**44.00**	**100.00%**	**164.06**
Purpose:	Temporarily flooded swales in agricultural settings.				
Planting Area:	Tallgrass Aspen Parklands, Prairie Parkland, and Eastern Broadleaf Forest Provinces. MnDOT Districts 2(west), 3B, 4, Metro, 6, 7 & 8.				

33-351 **Stormwater Northeast**

Common Name	Scientific Name	Rate (kg/ha)	Rate (lb/ac)	% of Mix (% by wt)	Seeds/ sq ft
fringed brome	*Bromus ciliatus*	4.09	3.65	18.43%	14.75
bluejoint	*Calamagrostis canadensis*	0.06	0.05	0.13%	4.90
hoding wild rye	*Elymus canadensis*	2.24	2.00	5.71%	3.82
Virginia wild rye	*Elymus virginicus*	2.24	2.00	5.73%	3.09
tall manna grass	*Glyceria grandis*	0.18	0.16	0.44%	4.20
fowl bluegrass	*Poa palustris*	0.72	0.64	1.82%	30.40
	Total Grasses	**9.53**	**8.50**	**24.26%**	**60.86**
porcupine sedge	*Carex hystericina*	0.10	0.09	0.26%	1.00
pointed broom sedge	*Carex scoparia*	0.04	0.04	0.12%	1.30
dark green bulrush	*Scirpus atrovirens*	0.30	0.27	0.76%	45.00
woolgrass	*Scirpus cyperinus*	0.11	0.10	0.27%	60.00
	Total Sedges and Rushes	**0.56**	**0.50**	**0.27%**	**107.30**
Canada anemone	*Anemone canadensis*	0.11	0.10	0.26%	0.30
marsh milkweed	*Asclepias incarnata*	0.50	0.45	1.30%	0.80
flat-topped aster	*Doellingeria umbellata*	0.11	0.10	0.29%	2.50
common boneset	*Eupatorium perfoliatum*	0.06	0.05	0.15%	3.00
grass-leaved goldenrod	*Euthamia graminifolia*	0.04	0.04	0.11%	5.00
spotted Joe pye weed	*Eutrochium maculatum*	0.17	0.15	0.42%	5.10
blue monkey flower	*Mimulus ringens*	0.02	0.02	0.07%	20.00
giant goldenrod	*Solidago gigantea*	0.02	0.02	0.06%	2.00
eastern panicled aster	*Symphyotrichum lanceolatum*	0.02	0.02	0.05%	1.30
tall meadow-rue	*Thalictrum dasycarpum*	0.08	0.08	0.18%	0.40
	Total Forbs	**1.12**	**1.00**	**2.90%**	**40.10**
Oats	*Avena sativa*	28.02	25.00	71.43%	11.14
	Total Cover Crop	**28.02**	**25.00**	**71.43%**	**11.14**
	Totals	**39.23**	**35.00**	**100.00%**	**219.40**
Purpose:	Stormwater pond edges, temporarily flooded dry ponds, and temporarily flooded ditch bottoms.				
Planting Area:	Laurentian Mixed Forest Province. MnDOT Districts 1, 2(east) and 3A.				

34-171 **Wetland Rehabilitation**

Common Name	Scientific Name	Rate (kg/ha)	Rate (lb/ac)	% of Mix (% by wt)	Seeds/ sq ft
Virginia wild rye	*Elymus virginicus*	3.36	3.00	58.61%	4.63
fowl bluegrass	*Poa palustris*	1.12	1.00	18.89%	47.80
	Total Grasses	**4.48**	**4.00**	**75.50%**	**52.43**
fox sedge	*Carex vulpinoidea*	0.22	0.20	3.65%	7.50
path rush	*Juncus tenuis*	0.18	0.16	3.03%	59.00
dark green bulrush	*Scirpus atrovirens*	0.40	0.36	6.70%	60.00
woolgrass	*Scirpus cyperinus*	0.09	0.08	1.51%	50.00
	Total Sedges and Rushes	**0.90**	**0.80**	**15.09%**	**176.50**
nodding bur marigold	*Bidens cernua*	0.15	0.13	2.46%	1.00
Water Horehound	*Lycopus americanus*	0.37	0.33	6.29%	23.15
blue monkey flower	*Mimulus ringens*	0.04	0.04	0.67%	30.00
	Total Forbs	**0.56**	**0.50**	**9.41%**	**54.15**
	Totals:	**5.94**	**5.30**	**100.00%**	**283.08**
Purpose:	Interseeding into establishing wetlands after weed control spraying. Also suitable for two to five year short term soil stabilization for areas with saturated soils.				
Planting Area:	Statewide				

34-181 **Emergent Wetland**

Common Name	Scientific Name	Rate (kg/ha)	Rate (lb/ac)	% of Mix (% by wt)	Seeds/ sq ft
American slough grass	*Beckmannia syzigachne*	0.78	0.70	14.07%	12.92
tall manna grass	*Glyceria grandis*	0.28	0.25	4.98%	6.40
rice cut grass	*Leersia oryzoides*	0.34	0.30	5.93%	3.70
	Total Grasses	**1.40**	**1.25**	**24.98%**	**23.02**
river bulrush	*Bolboschoenus fluviatilis*	0.85	0.76	15.20%	1.20
grassy sedge	*Carex comosa*	0.20	0.18	3.63%	2.00
lake sedge	*Carex lacustris*	0.07	0.06	1.19%	0.24
prairie sedge	*Carex prairea*	0.04	0.04	0.77%	0.75
blunt spikerush	*Eleocharis acicularis*	0.11	0.10	1.94%	2.50
marsh spikerush	*Eleocharis palustris*	0.11	0.10	2.03%	1.90
Torrey's rush	*Juncus torreyi*	0.04	0.04	0.85%	25.00
Three-square bulrush	*Schoenoplectus pungens*	0.26	0.23	4.54%	1.00
soft stem bulrush	*Schoenoplectus tabernaemontani*	0.49	0.44	8.78%	5.00
woolgrass	*Scirpus cyperinus*	0.06	0.05	1.02%	32.00
	Total Sedges and Rushes	**2.24**	**2.00**	**39.95%**	**71.39**
Sweet flag	*Acorus americanus*	0.31	0.28	5.53%	0.67
common water plantain	*Alisma triviale*	0.45	0.40	8.00%	9.70
marsh milkweed	*Asclepias incarnata*	0.31	0.28	5.67%	0.50
broad-leaved arrowhead	*Sagittaria latifolia*	0.34	0.30	6.07%	8.80
giant bur reed	*Sparganium eurycarpum*	0.55	0.49	9.80%	0.09
	Total Forbs	**1.96**	**1.75**	**35.07%**	**17.76**
	Totals	**5.60**	**5.00**	**100.00%**	**112.17**
Purpose:	Emergent wetland restoration for use in wetland mitigation, shoreline restoration, and stormwater ponds where emergent vegetation is desired.				
Planting Area:	Statewide				

34-261 **Riparian South & West**

Common Name	Scientific Name	Rate (kg/ha)	Rate (lb/ac)	% of Mix (% by wt)	Seeds/ sq ft
American slough grass	*Beckmannia syzigachne*	1.52	1.36	4.30%	24.90
riverbank wild rye	*Elymus riparius*	0.56	0.50	1.58%	0.53
Virginia wild rye	*Elymus virginicus*	1.96	1.75	5.56%	2.70
tall manna grass	*Glyceria grandis*	0.28	0.25	0.80%	6.50

fowl manna grass	*Glyceria striata*	0.10	0.09	0.29%	3.09
rice cut grass	*Leersia oryzoides*	0.16	0.15	0.51%	2.00
fowl bluegrass	*Poa palustris*	0.94	0.84	2.66%	48.00
prairie cordgrass	*Spartina pectinata*	0.34	0.30	0.96%	0.74
	Total Grasses	**5.85**	**5.29**	**16.85%**	**80.37**
tussock sedge	*Carex stricta*	0.04	0.04	0.13%	0.60
porcupine brown sedge	*Carex scoparia*	0.07	0.06	0.21%	2.00
fox sedge	*Carex vulpinoidea*	0.22	0.20	0.65%	7.50
path rush	*Juncus tenuis*	0.03	0.03	0.09%	10.00
dark green bulrush	*Scirpus atrovirens*	0.13	0.12	0.38%	20.00
woolgrass	*Scirpus cyperinus*	0.06	0.05	0.15%	30.00
	Total Sedges and Rushes	**0.56**	**0.50**	**1.61%**	**70.36**
marsh milkweed	*Asclepias incarnata*	0.13	0.12	0.38%	0.21
common boneset	*Eupatorium perfoliatum*	0.03	0.03	0.11%	2.00
spotted Joe pye weed	*Eutrochium maculatum*	0.07	0.06	0.18%	2.00
autumn sneezeweed	*Helenium autumnale*	0.06	0.05	0.17%	2.50
giant sunflower	*Helianthus giganteus*	0.08	0.07	0.22%	0.25
spotted touch-me-not	*Impatiens capensis*	0.06	0.05	0.17%	0.08
great lobelia	*Lobelia siphilitica*	0.03	0.03	0.09%	5.00
blue monkey flower	*Mimulus ringens*	0.01	0.01	0.02%	5.07
Virginia mountain mint	*Pycnanthemum virginianum*	0.08	0.08	0.18%	4.00
tall coneflower	*Rudbeckia laciniata*	0.06	0.05	0.15%	0.25
giant goldenrod	*Solidago gigantea*	0.02	0.02	0.07%	2.00
blue vervain	*Verbena hastata*	0.17	0.15	0.46%	5.00
bunched ironweed	*Vernonia fasciculata*	0.07	0.06	0.18%	0.50
	Total Forbs	**0.84**	**0.75**	**2.36%**	**28.88**
Oats	*Avena sativa*	26.02	24.00	76.37%	11.14
	Total Cover Crop	**26.02**	**24.00**	**76.37%**	**11.14**
	Totals:	**33.31**	**31.50**	**100.00%**	**190.88**
Purpose:	Native riparian and floodplain plantings for wetland mitigation, ecological restoration, or general permanent cover after culvert or bridge work. Tolerates partial shade.				
Planting Area:	Tallgrass Aspen Parklands, Prairie Parkland, and Eastern Broadleaf Forest Provinces. MnDOT Districts 2(west), 3B, 4, Metro, 6, 7 & 8.				

34-262 **Wet Prairie**

Common Name	Scientific Name	Rate (kg/ha)	Rate (lb/ac)	% of Mix (% by wt)	Seeds/ sq ft
big bluestem	*Andropogon gerardii*	1.12	1.00	8.89%	3.87
fringed brome	*Bromus ciliatus*	1.68	1.50	13.38%	6.08
bluejoint	*Calamagrostis canadensis*	0.04	0.04	0.27%	4.00
Virginia wild rye	*Elymus virginicus*	1.96	1.75	12.02%	2.70
tall manna grass	*Glyceria grandis*	0.17	0.15	1.02%	3.80
fowl manna grass	*Glyceria striata*	0.12	0.11	0.73%	3.50
switchgrass	*Panicum virgatum*	0.84	0.75	5.16%	3.85
fowl bluegrass	*Poa palustris*	0.22	0.20	1.39%	9.60
Indian grass	*Sorghastrum nutans*	0.56	0.50	3.44%	2.20
prairie cordgrass	*Spartina pectinata*	0.56	0.50	3.41%	1.20
	Total Grasses	**7.29**	**6.50**	**44.76%**	**40.60**
awlfruit sedge	*Carex pellita*	0.06	0.05	0.32%	0.47
tussock sedge	*Carex stricta*	0.02	0.02	0.12%	0.48
fox sedge	*Carex vulpinoidea*	0.11	0.10	0.66%	3.50
dark green bulrush	*Scirpus atrovirens*	0.11	0.10	0.72%	17.74
woolgrass	*Scirpus cyperinus*	0.03	0.03	0.18%	18.00
	Total Sedges and Rushes	**0.34**	**0.30**	**2.05%**	**38.19**
Canada anemone	*Anemone canadensis*	0.03	0.03	0.21%	0.09
marsh milkweed	*Asclepias incarnata*	0.09	0.08	0.55%	0.14
Canada tick trefoil	*Desmodium canadense*	0.56	0.50	3.41%	1.00
flat-topped aster	*Doellingeria umbellata*	0.06	0.05	0.34%	1.20
common boneset	*Eupatorium perfoliatum*	0.03	0.03	0.23%	2.00
grass-leaved goldenrod	*Euthamia graminifolia*	0.02	0.02	0.11%	2.00
spotted Joe pye weed	*Eutrochium maculatum*	0.04	0.04	0.30%	1.50
autumn sneezeweed	*Helenium autumnale*	0.06	0.05	0.35%	2.39
sawtooth sunflower	*Helianthus grosseserratus*	0.06	0.05	0.38%	0.30
great blazing star	*Liatris pycnostachya*	0.02	0.02	0.17%	0.10
great lobelia	*Lobelia siphilitica*	0.01	0.01	0.05%	1.40
blue monkey flower	*Mimulus ringens*	0.01	0.01	0.05%	6.40
Virginia mountain mint	*Pycnanthemum virginianum*	0.09	0.08	0.55%	6.50
red-stemmed aster	*Symphyotrichum puniceum*	0.09	0.08	0.56%	2.40
blue vervain	*Verbena hastata*	0.17	0.15	1.06%	5.25
bunched ironweed	*Vernonia fasciculata*	0.03	0.03	0.23%	0.30
Culver's root	*Veronicastrum virginicum*	0.02	0.02	0.14%	6.00
golden alexanders	*Zizia aurea*	0.28	0.25	1.76%	1.03
	Total Forbs	**1.68**	**1.50**	**10.45%**	**40.00**
Oats	*Avena sativa*	6.95	6.20	42.74%	2.76
	Total Cover Crop	**6.95**	**6.20**	**42.74%**	**2.76**
	Totals:	**16.25**	**14.50**	**100.00%**	**121.55**
Purpose:	Wet prairie reconstruction for wetland mitigation or ecological restoration				
Planting Area:	Tallgrass Aspen Parklands, Prairie Parkland, and Eastern Broadleaf Forest Provinces. MnDOT Districts 2(west), 3B, 4, Metro, 6, 7 & 8.				

34-271 **Wet Meadow South & West**

Common Name	Scientific Name	Rate (kg/ha)	Rate (lb/ac)	% of Mix (% by wt)	Seeds/ sq ft
fringed brome	*Bromus ciliatus*	1.23	1.10	9.18%	4.45
bluejoint	*Calamagrostis canadensis*	0.06	0.05	0.41%	5.00
Virginia wild rye	*Elymus virginicus*	1.12	1.00	8.37%	1.55
rice cut grass	*Leersia oryzoides*	0.28	0.25	2.07%	3.10
tall manna grass	*Glyceria grandis*	0.17	0.15	1.26%	3.90
fowl manna grass	*Glyceria striata*	0.11	0.10	0.83%	3.30
fowl bluegrass	*Poa palustris*	0.39	0.35	2.88%	16.50
	Total Grasses	**3.36**	**3.00**	**25.00%**	**37.80**
bristly sedge	*Carex comosa*	0.24	0.21	1.76%	2.36
beaked broom sedge	*Carex scoparia*	0.06	0.05	0.41%	1.60
awl-fruited sedge	*Carex stipata*	0.19	0.17	1.40%	2.10
tussock sedge	*Carex stricta*	0.03	0.03	0.21%	0.50
fox sedge	*Carex vulpinoidea*	0.16	0.14	1.13%	8.00
path rush	*Juncus tenuis*	0.04	0.04	0.34%	15.00
dark green bulrush	*Scirpus atrovirens*	0.20	0.18	1.48%	30.00
woolgrass	*Scirpus cyperinus*	0.09	0.08	0.67%	50.00
	Total Sedges and Rushes	**1.01**	**0.90**	**7.44%**	**108.56**
marsh milkweed	*Asclepias incarnata*	0.27	0.24	2.01%	0.43
common boneset	*Eupatorium perfoliatum*	0.02	0.02	0.15%	1.30
grass-leaved goldenrod	*Euthamia graminifolia*	0.01	0.01	0.08%	1.00
spotted Joe pye weed	*Eutrochium maculatum*	0.02	0.02	0.15%	0.75
autumn sneezeweed	*Helenium autumnale*	0.03	0.03	0.23%	1.30
sawtooth sunflower	*Helianthus grosseserratus*	0.04	0.04	0.30%	0.20
great lobelia	*Lobelia siphilitica*	0.02	0.02	0.13%	2.90
blue monkey flower	*Mimulus ringens*	0.01	0.01	0.07%	0.90
Virginia mountain mint	*Pycnanthemum virginianum*	0.07	0.06	0.53%	5.10
giant goldenrod	*Solidago gigantea*	0.02	0.02	0.14%	1.50
eastern panicled aster	*Symphyotrichum lanceolatum*	0.03	0.03	0.22%	1.50
red-stemmed aster	*Symphyotrichum puniceum*	0.19	0.17	1.42%	5.50
tall meadow rue	*Thalictrum dasycarpum*	0.01	0.01	0.12%	0.11

blue vervain	*Verbena hastata*	0.15	0.13	1.12%	4.81
bunched ironweed	*Vernonia fasciculata*	0.03	0.03	0.26%	0.30
Culver's root	*Veronicastrum virginicum*	0.01	0.01	0.12%	4.20
golden alexanders	*Zizia aurea*	0.28	0.25	2.06%	1.00
	Total Forbs:	**1.23**	**1.10**	**9.19%**	**38.00**
Oats	*Avena sativa*	7.85	7.00	58.37%	3.12
	Total Cover Crop:	**7.85**	**7.00**	**58.37%**	**3.12**
	Totals:	**13.45**	**12.00**	**100.00%**	**186.48**
Purpose:	Wet meadow / Sedge meadow reconstruction for wetland mitigation or ecological restoration projects				
Planting Area:	Tallgrass Aspen Parklands, Prairie Parkland, and Eastern Broadleaf Forest Provinces. Mn/DOT Districts 2(west), 3B, 4, Metro, 6, 7 & 8.				

34-361 **Riparian Northeast**

Common Name	Scientific Name	Rate (kg/ha)	Rate (lb/ac)	% of Mix (% by wt)	Seeds/ sq ft
American slough grass	*Beckmannia syzigachne*	1.68	1.50	4.78%	27.64
bluejoint	*Calamagrostis canadensis*	0.07	0.06	0.19%	6.00
riverbank wild rye	*Elymus riparius*	0.56	0.50	1.57%	0.53
Virginia wild rye	*Elymus virginicus*	2.24	2.00	6.33%	3.08
tall manna grass	*Glyceria grandis*	0.28	0.25	0.80%	6.50
fowl manna grass	*Glyceria striata*	0.10	0.09	0.29%	3.00
rice cut grass	*Leersia oryzoides*	0.17	0.15	0.49%	1.93
fowl bluegrass	*Poa palustris*	0.78	0.70	2.21%	33.50
	Total Grasses	**5.89**	**5.25**	**16.68%**	**82.18**
tussock sedge	*Carex stricta*	0.04	0.04	0.13%	0.80
pointed broom sedge	*Carex scoparia*	0.07	0.06	0.21%	2.00
fox sedge	*Carex vulpinoidea*	0.22	0.20	0.65%	7.50
path rush	*Juncus tenuis*	0.03	0.03	0.09%	10.00
dark green bulrush	*Scirpus atrovirens*	0.13	0.12	0.38%	20.00
woolgrass	*Scirpus cyperinus*	0.06	0.05	0.15%	30.00
	Total Sedges and Rushes	**0.56**	**0.50**	**1.61%**	**70.30**
marsh milkweed	*Asclepias incarnata*	0.13	0.12	0.38%	0.21
flat-topped aster	*Doellingeria umbellata*	0.04	0.04	0.13%	1.00
common boneset	*Eupatorium perfoliatum*	0.06	0.05	0.16%	3.00
grass-leaved goldenrod	*Euthamia graminifolia*	0.08	0.07	0.22%	9.00
spotted Joe pye weed	*Eutrochium maculatum*	0.12	0.11	0.34%	1.70
giant sunflower	*Helianthus giganteus*	0.08	0.07	0.22%	0.25
spotted touch-me-not	*Impatiens capensis*	0.03	0.03	0.11%	0.05
blue monkey flower	*Mimulus ringens*	0.02	0.02	0.05%	13.00
giant goldenrod	*Solidago gigantea*	0.02	0.02	0.05%	1.50
blue vervain	*Verbena hastata*	0.25	0.22	0.66%	7.15
	Total Forbs	**0.84**	**0.75**	**2.34%**	**39.06**
Oats	*Avena sativa*	28.02	25.00	79.37%	11.14
	Total Cover Crop:	**28.02**	**25.00**	**79.37%**	**11.14**
	Totals:	**35.31**	**31.50**	**100.00%**	**202.67**
Purpose:	Native riparian and floodplain plantings for wetland mitigation, ecological restoration, or general permanent cover after culvert or bridge work. Tolerates partial shade.				
Planting Area:	Laurentian Mixed Forest Province. Mn/DOT Districts 1, 2(east) and 3A				

34-371 **Wet Meadow Northeast**

Common Name	Scientific Name	Rate (kg/ha)	Rate (lb/ac)	% of Mix (% by wt)	Seeds/ sq ft
fringed brome	*Bromus ciliatus*	2.24	2.00	16.04%	8.10
bluejoint	*Calamagrostis canadensis*	0.11	0.10	0.78%	10.00
Virginia wild rye	*Elymus virginicus*	1.68	1.50	11.99%	2.31
tall manna grass	*Glyceria grandis*	0.28	0.25	1.96%	6.30
fowl bluegrass	*Poa palustris*	0.73	0.65	5.19%	31.00
	Total Grasses	**5.04**	**4.50**	**35.96%**	**57.71**
tussock sedge	*Carex stricta*	0.04	0.04	0.35%	0.85
pointed broom sedge	*Carex scoparia*	0.06	0.05	0.39%	1.80
dark green bulrush	*Scirpus atrovirens*	0.22	0.20	1.56%	33.00
woolgrass	*Scirpus cyperinus*	0.07	0.06	0.51%	40.00
	Total Sedges and Rushes	**0.39**	**0.35**	**2.81%**	**75.35**
Canada anemone	*Anemone canadensis*	0.11	0.10	0.82%	0.30
marsh milkweed	*Asclepias incarnata*	0.27	0.24	1.96%	0.43
flat-topped aster	*Doellingeria umbellata*	0.11	0.10	0.81%	2.50
common boneset	*Eupatorium perfoliatum*	0.10	0.09	0.66%	5.00
grass-leaved goldenrod	*Euthamia graminifolia*	0.04	0.04	0.31%	8.00
spotted Joe pye weed	*Eutrochium maculatum*	0.16	0.14	1.15%	6.00
blue monkey flower	*Mimulus ringens*	0.03	0.03	0.24%	25.00
giant goldenrod	*Solidago gigantea*	0.03	0.03	0.20%	2.30
eastern panicled aster	*Symphyotrichum lanceolatum*	0.03	0.03	0.28%	2.00
	Total Forbs	**0.90**	**0.80**	**6.44%**	**47.53**
Oats	*Avena sativa*	7.66	6.85	54.79%	3.05
	Total Cover Crop:	**7.66**	**6.85**	**54.79%**	**3.05**
	Totals:	**14.01**	**12.50**	**100.00%**	**183.64**
Purpose:	Wet meadow / Sedge meadow reconstruction for wetland mitigation or ecological restoration.				
Planting Area:	Laurentian Mixed Forest Province. Mn/DOT Districts 1, 2(east) and 3A				

35-221 **Dry Prairie General**

Common Name	Scientific Name	Rate (kg/ha)	Rate (lb/ac)	% of Mix (% by wt)	Seeds/ sq ft
big bluestem	*Andropogon gerardii*	0.78	0.70	1.92%	2.57
side-oats grama	*Bouteloua curtipendula*	1.36	3.00	8.22%	6.61
blue grama	*Bouteloua gracilis*	0.56	0.50	1.37%	7.25
Ceilm's brome	*Bromus kalmii*	0.82	0.73	2.00%	2.14
bottlebrush wild rye	*Elymus canadensis*	1.12	1.00	2.74%	1.93
junegrass	*Koeleria macrantha*	0.28	0.25	0.69%	18.37
little bluestem	*Schizachyrium scoparium*	3.36	3.00	8.22%	16.53
Indian grass	*Sorghastrum nutans*	0.78	0.70	1.92%	3.09
prairie dropseed	*Sporobolus heterolepis*	0.13	0.12	0.34%	0.73
	Total Grasses	**11.21**	**10.00**	**27.43%**	**59.30**
blue giant hyssop	*Agastache foeniculum*	0.07	0.06	0.17%	2.07
dead plant	*Amorpha canescens*	0.10	0.09	0.26%	0.42
butterfly milkweed	*Asclepias tuberosa*	0.07	0.06	0.17%	0.10
Canada milk vetch	*Astragalus canadensis*	0.07	0.06	0.18%	0.40
bird's foot coreopsis	*Coreopsis palmata*	0.07	0.06	0.16%	0.21
white prairie clover	*Dalea candida*	0.07	0.06	0.15%	0.39
purple prairie clover	*Dalea purpurea*	0.21	0.19	0.51%	1.02
Canada tick trefoil	*Desmodium canadense*	0.07	0.06	0.18%	0.13
stiff sunflower	*Helianthus pauciflorus*	0.07	0.06	0.17%	0.09
rough blazing star	*Liatris aspera*	0.04	0.04	0.12%	0.25
wild bergamot	*Monarda fistulosa*	0.07	0.06	0.15%	1.42
stiff goldenrod	*Oligoneuron rigidum*	0.07	0.06	0.15%	0.83
large-flowered beard tongue	*Penstemon grandiflorus*	0.07	0.06	0.17%	0.32
black-eyed susan	*Rudbeckia hirta*	0.35	0.31	0.84%	10.32

gray goldenrod	*Solidago nemoralis*	0.04	0.04	0.10%	3.86
heath aster	*Symphyotrichum ericoides*	0.04	0.04	0.10%	2.58
smooth aster	*Symphyotrichum laeve*	0.07	0.06	0.17%	1.28
hoary vervain	*Verbena stricta*	0.15	0.13	0.34%	1.29
	Total Forbs	**1.66**	**1.50**	**4.09%**	**26.96**
Oats	*Avena sativa*	28.02	25.00	68.49%	11.13
	Total Cover Crop	**28.02**	**25.00**	**68.49%**	**11.13**
	Totals:	**40.91**	**36.50**	**100.00%**	**97.39**
Purpose:	General dry prairie mix for native roadsides, ecological restoration, or conservation program plantings.				
Planting Area:	Tallgrass Aspen Parklands, Prairie Parkland, and Eastern Broadleaf Forest Provinces. MnDOT Districts 2(west), 3B, 4, Metro, 6, 7 & 8.				

35-241 **Mesic Prairie General**

Common Name	Scientific Name	Rate (kg/ha)	Rate (lb/ac)	% of Mix (% by wt)	Seeds/ sq ft
big bluestem	*Andropogon gerardii*	2.24	2.00	5.48%	7.35
side-oats grama	*Bouteloua curtipendula*	1.70	1.60	4.39%	3.53
kalm's brome	*Bromus kalmii*	0.56	0.50	1.37%	1.47
nodding wild rye	*Elymus canadensis*	1.31	1.17	3.20%	2.23
slender wheatgrass	*Elymus trachycaulus*	1.12	1.00	2.73%	2.53
switchgrass	*Panicum virgatum*	0.07	0.06	0.17%	0.32
little bluestem	*Schizachyrium scoparium*	1.79	1.60	4.39%	8.82
Indian grass	*Sorghastrum nutans*	2.24	2.00	5.48%	8.62
prairie dropseed	*Sporobolus heterolepis*	0.05	0.07	0.18%	0.39
	Total Grasses	**11.21**	**10.00**	**27.39%**	**35.46**
blue giant hyssop	*Agastache foeniculum*	0.07	0.06	0.15%	1.82
lead plant	*Amorpha canescens*	0.07	0.06	0.15%	0.28
common milkweed	*Asclepias syriaca*	0.04	0.04	0.10%	0.06
butterfly milkweed	*Asclepias tuberosa*	0.04	0.04	0.10%	0.06
Canada milk vetch	*Astragalus canadensis*	0.07	0.06	0.17%	0.39
white prairie clover	*Dalea candida*	0.07	0.06	0.17%	0.44
purple prairie clover	*Dalea purpurea*	0.21	0.19	0.51%	1.03
Canada tick trefoil	*Desmodium canadense*	0.07	0.06	0.18%	0.13
stiff sunflower	*Helianthus pauciflorus*	0.07	0.06	0.17%	0.09
ox-eye	*Heliopsis helianthoides*	0.15	0.13	0.34%	0.29
rough blazing star	*Liatris aspera*	0.03	0.03	0.08%	0.18
dotted blazing star	*Liatris punctata*	0.03	0.03	0.09%	0.13
wild bergamot	*Monarda fistulosa*	0.07	0.06	0.17%	1.61
stiff goldenrod	*Oligoneuron rigidum*	0.07	0.06	0.17%	0.04
black-eyed susan	*Rudbeckia hirta*	0.35	0.31	0.86%	10.56
heath aster	*Symphyotrichum ericoides*	0.03	0.03	0.09%	2.30
smooth aster	*Symphyotrichum laeve*	0.07	0.06	0.17%	1.28
blue vervain	*Verbena hastata*	0.04	0.04	0.12%	1.50
hoary vervain	*Verbena stricta*	0.07	0.06	0.17%	0.64
golden alexanders	*Zizia aurea*	0.07	0.06	0.15%	0.23
	Total Forbs	**1.66**	**1.50**	**4.11%**	**23.89**
Oats	*Avena sativa*	28.02	25.00	68.50%	11.14
	Total Cover Crop	**28.02**	**25.00**	**68.50%**	**11.14**
	Totals:	**40.91**	**36.50**	**100.00%**	**70.49**
Purpose:	General mesic prairie mix for native roadsides, ecological restoration, or conservation program plantings.				
Planting Area:	Tallgrass Aspen Parklands, Prairie Parkland, and Eastern Broadleaf Forest Provinces. MnDOT Districts 2(west), 3B, 4, Metro, 6, 7 & 8.				

35-421 **Dry Prairie Northwest**

Common Name	Scientific Name	Rate (kg/ha)	Rate (lb/ac)	% of Mix (% by wt)	Seeds/ sq ft
side-oats grama	*Bouteloua curtipendula*	1.35	1.20	10.89%	2.64
blue grama	*Bouteloua gracilis*	0.84	0.75	6.81%	11.00
kalm's brome	*Bromus kalmii*	1.01	0.90	8.17%	2.64
nodding wild rye	*Elymus canadensis*	1.12	1.00	9.09%	1.91
slender wheatgrass	*Elymus trachycaulus*	1.12	1.00	9.11%	2.54
porcupine grass	*Hesperostipa spartea*	0.50	0.45	4.09%	0.11
junegrass	*Koeleria macrantha*	0.26	0.26	2.23%	18.00
little bluestem	*Schizachyrium scoparium*	1.68	1.50	13.63%	8.28
sand dropseed	*Sporobolus cryptandrus*	0.22	0.20	1.86%	15.00
	Total Grasses	**8.13**	**7.25**	**65.88%**	**62.18**
Prairie Wild Onion	*Allium stellatum*	0.03	0.03	0.27%	0.12
Canada milk vetch	*Astragalus canadensis*	0.08	0.07	0.61%	0.42
white prairie clover	*Dalea candida*	0.07	0.06	0.55%	0.42
purple prairie clover	*Dalea purpurea*	0.12	0.11	0.99%	0.60
Canada tick trefoil	*Desmodium canadense*	0.06	0.05	0.45%	0.10
stiff sunflower	*Helianthus pauciflorus*	0.03	0.03	0.31%	0.05
ox eye	*Heliopsis helianthoides*	0.07	0.06	0.58%	0.14
rough blazing star	*Liatris aspera*	0.03	0.03	0.23%	0.15
dotted blazing star	*Liatris punctata*	0.02	0.02	0.18%	0.05
wild bergamot	*Monarda fistulosa*	0.03	0.03	0.27%	0.77
stiff goldenrod	*Oligoneuron rigidum*	0.03	0.03	0.27%	0.45
prairie coneflower	*Ratibida columnifera*	0.07	0.06	0.55%	0.93
black-eyed susan	*Rudbeckia hirta*	0.07	0.06	0.55%	2.03
gray goldenrod	*Solidago nemoralis*	0.02	0.02	0.17%	2.00
heath aster	*Symphyotrichum ericoides*	0.01	0.01	0.14%	1.10
smooth aster	*Symphyotrichum laeve*	0.03	0.03	0.27%	0.61
heart-leaved alexanders	*Zizia aptera*	0.06	0.05	0.50%	0.24
	Total Forbs	**0.84**	**0.75**	**6.86%**	**10.18**
Oats	*Avena sativa*	3.36	3.00	27.26%	1.34
	Total Cover Crop	**3.36**	**3.00**	**27.26%**	**1.34**
	Totals:	**12.33**	**11.00**	**100.00%**	**73.62**
Purpose:	Regional dry prairie reconstruction for wetland mitigation, ecological restoration or conservation program plantings.				
Planting Area:	Tallgrass Aspen Parklands Province, Red River Prairie Section, Hardwood Hills subsection of the MN & NE IA Morainal Section, far western portions of the Laurentian Mixed Forest Province. MnDOT Districts 2(west) & 4(north).				

35-441 **Mesic Prairie Northwest**

Common Name	Scientific Name	Rate (kg/ha)	Rate (lb/ac)	% of Mix (% by wt)	Seeds/ sq ft
big bluestem	*Andropogon gerardii*	1.12	1.00	9.08%	3.67
side-oats grama	*Bouteloua curtipendula*	1.35	1.20	10.89%	2.64
nodding wild rye	*Elymus canadensis*	1.12	1.00	9.09%	1.91
slender wheatgrass	*Elymus trachycaulus*	1.12	1.00	9.11%	2.54
porcupine grass	*Hesperostipa spartea*	0.47	0.42	3.82%	0.11
switchgrass	*Panicum virgatum*	0.20	0.18	1.59%	0.90
little bluestem	*Schizachyrium scoparium*	1.68	1.50	13.66%	8.28
Indian grass	*Sorghastrum nutans*	1.35	1.20	10.91%	5.25
	Total Grasses	**8.41**	**7.50**	**68.15%**	**25.33**
Prairie Wild Onion	*Allium stellatum*	0.03	0.03	0.27%	0.12
Canada milk vetch	*Astragalus canadensis*	0.07	0.06	0.54%	0.37
white prairie clover	*Dalea candida*	0.07	0.06	0.55%	0.42
purple prairie clover	*Dalea purpurea*	0.10	0.09	0.83%	0.50

Canada tick trefoil	Desmodium canadense	0.09	0.08	0.71%	9.14
ox-eye	Heliopsis helianthoides	0.07	0.06	0.55%	0.14
rough blazing star	Liatris aspera	0.03	0.03	0.28%	0.16
great blazing star	Liatris pycnostachya	0.07	0.06	0.54%	0.24
wild bergamot	Monarda fistulosa	0.03	0.03	0.27%	0.77
stiff goldenrod	Oligoneuron rigidum	0.03	0.03	0.27%	0.45
Virginia mountain mint	Pycnanthemum virginianum	0.04	0.04	0.34%	3.09
prairie coneflower	Ratibida columnifera	0.07	0.06	0.55%	0.93
black-eyed susan	Rudbeckia hirta	0.08	0.07	0.59%	2.20
heath aster	Symphyotrichum ericoides	0.01	0.01	0.14%	1.10
smooth aster	Symphyotrichum laeve	0.03	0.03	0.27%	0.61
blue vervain	Verbena hastata	0.10	0.09	0.77%	2.91
golden alexanders	Zizia aurea	0.19	0.17	1.56%	0.78
	Total Forbs	**1.12**	**1.00**	**9.09%**	**14.81**
Oats	Avena sativa	2.80	2.50	22.76%	1.12
	Total Cover Crop	**2.80**	**2.50**	**22.76%**	**1.12**
	Totals:	**12.33**	**11.00**	**100.00%**	**41.25**
Purpose:	Regional mesic prairie reconstruction for wetland mitigation, ecological restoration, or conservation program plantings.				
Planting Area:	Tallgrass Aspen Parklands Province, Red River Prairie Section, Hardwood Hills subsection of the Mfd & NE IA Morainal Section, may extend into the far western portions of the Laurentian Mixed Forest Province. MnDOT Districts 2(west) & 4(north).				

35-521 **Dry Prairie Southwest**

Common Name	Scientific Name	Rate (kg/ha)	Rate (lb/ac)	% of Mix (% by wt)	Seeds/ sq ft
side-oats grama	Bouteloua curtipendula	1.57	1.40	11.16%	3.08
blue grama	Bouteloua gracilis	1.06	0.95	7.57%	13.90
nodding wild rye	Elymus canadensis	1.35	1.20	9.63%	2.30
slender wheatgrass	Elymus trachycaulus	1.12	1.00	7.99%	2.53
porcupine grass	Hesperostipa spartea	0.84	0.75	6.02%	0.19
junegrass	Koeleria macrantha	0.34	0.30	2.40%	22.00
little bluestem	Schizachyrium scoparium	1.68	1.50	11.96%	8.24
sand dropseed	Sporobolus cryptandrus	0.17	0.15	1.20%	11.00
	Total Grasses	**8.13**	**7.25**	**57.93%**	**63.23**
whorled milkweed	Asclepias verticillata	0.01	0.01	0.10%	0.05
Canada milk vetch	Astragalus canadensis	0.07	0.06	0.51%	0.40
white prairie clover	Dalea candida	0.07	0.06	0.46%	0.40
purple prairie clover	Dalea purpurea	0.11	0.10	0.80%	0.55
Canada tick trefoil	Desmodium canadense	0.04	0.04	0.36%	0.09
narrow-leaved purple coneflower	Echinacea angustifolia	0.09	0.08	0.62%	0.20
ox-eye	Heliopsis helianthoides	0.04	0.04	0.36%	0.10
round-headed bush clover	Lespedeza capitata	0.03	0.03	0.27%	0.10
rough blazing star	Liatris aspera	0.02	0.02	0.18%	0.13
dotted blazing star	Liatris punctata	0.02	0.02	0.16%	0.05
wild bergamot	Monarda fistulosa	0.03	0.03	0.24%	0.76
stiff goldenrod	Oligoneuron rigidum	0.08	0.07	0.53%	1.00
black-eyed susan	Rudbeckia hirta	0.08	0.07	0.52%	2.20
heath aster	Symphyotrichum ericoides	0.01	0.01	0.10%	0.90
smooth aster	Symphyotrichum laeve	0.03	0.03	0.24%	0.60
bracted spiderwort	Tradescantia bracteata	0.02	0.02	0.13%	0.06
hoary vervain	Verbena stricta	0.11	0.10	0.78%	1.00
golden alexanders	Zizia aurea	0.24	0.21	1.68%	0.85
	Total Forbs	**1.12**	**1.00**	**8.02%**	**9.44**
Oats	Avena sativa	4.75	4.25	34.04%	1.90
	Total Cover Crop	**4.75**	**4.25**	**34.04%**	**1.90**
	Totals:	**14.01**	**12.50**	**100.00%**	**74.57**
Purpose:	Regional dry prairie reconstruction for wetland mitigation, ecological restoration, or conservation program plantings.				
Planting Area:	North-Central Glaciated Plains Section. MnDOT Districts 3A(southwest) 3B, 4(south), 7 & 8.				

35-541 **Mesic Prairie Southwest**

Common Name	Scientific Name	Rate (kg/ha)	Rate (lb/ac)	% of Mix (% by wt)	Seeds/ sq ft
big bluestem	Andropogon gerardii	1.01	0.90	7.49%	3.30
side-oats grama	Bouteloua curtipendula	1.01	0.90	7.49%	1.98
nodding wild rye	Elymus canadensis	1.01	0.90	7.49%	1.71
slender wheatgrass	Elymus trachycaulus	1.01	0.90	7.49%	2.27
green needle grass	Nassella viridula	0.49	0.44	3.67%	1.70
switchgrass	Panicum virgatum	0.18	0.16	1.30%	0.90
western wheatgrass	Pascopyrum smithii	0.56	0.50	4.15%	1.30
little bluestem	Schizachyrium scoparium	1.68	1.50	12.50%	8.37
Indian grass	Sorghastrum nutans	1.68	1.50	12.54%	8.63
	Total Grasses	**8.63**	**7.70**	**64.06%**	**27.96**
Canada milk vetch	Astragalus canadensis	0.07	0.06	0.53%	0.40
partridge pea	Chamaecrista fasciculata	0.11	0.10	0.84%	0.10
white prairie clover	Dalea candida	0.03	0.03	0.24%	0.20
purple prairie clover	Dalea purpurea	0.08	0.07	0.61%	0.40
Canada tick trefoil	Desmodium canadense	0.06	0.05	0.45%	0.11
narrow-leaved purple coneflower	Echinacea angustifolia	0.09	0.08	0.65%	0.20
ox-eye	Heliopsis helianthoides	0.07	0.06	0.50%	0.14
rough blazing star	Liatris aspera	0.03	0.03	0.28%	0.20
great blazing star	Liatris pycnostachya	0.02	0.02	0.21%	0.10
wild bergamot	Monarda fistulosa	0.04	0.04	0.29%	0.90
stiff goldenrod	Oligoneuron rigidum	0.03	0.03	0.28%	0.50
gray-headed coneflower	Ratibida pinnata	0.08	0.07	0.61%	0.80
black-eyed susan	Rudbeckia hirta	0.07	0.06	0.49%	2.00
smooth aster	Symphyotrichum laeve	0.03	0.03	0.25%	0.60
blue vervain	Verbena hastata	0.08	0.07	0.61%	2.50
hoary vervain	Verbena stricta	0.06	0.05	0.41%	0.50
golden alexanders	Zizia aurea	0.28	0.25	2.06%	1.00
	Total Forbs	**1.23**	**1.10**	**9.11%**	**10.65**
Oats	Avena sativa	3.59	3.20	26.63%	1.42
	Total Cover Crop	**3.59**	**3.20**	**26.63%**	**1.42**
	Totals:	**13.45**	**12.00**	**100.00%**	**40.03**
Purpose:	Regional mesic prairie reconstruction for wetland mitigation, ecological restoration, or conservation program plantings.				
Planting Area:	North-Central Glaciated Plains Section. MnDOT Districts 3A(southwest) 3B, 4(south), 7 & 8.				

35-621 **Dry Prairie Southeast**

Common Name	Scientific Name	Rate (kg/ha)	Rate (lb/ac)	% of Mix (% by wt)	Seeds/ sq ft
side-oats grama	Bouteloua curtipendula	1.27	1.13	10.23%	2.48
blue grama	Bouteloua gracilis	0.76	0.68	6.19%	10.00
Kalm's brome	Bromus kalmii	0.35	0.31	2.78%	0.90
nodding wild rye	Elymus canadensis	1.68	1.50	13.61%	2.86
slender wheatgrass	Elymus trachycaulus	1.32	1.18	10.76%	3.00
junegrass	Koeleria macrantha	0.46	0.41	3.71%	30.00
little bluestem	Schizachyrium scoparium	1.69	1.51	13.70%	8.30

tall dropseed	*Sporobolus cryptandrus*	0.25	0.22	1.98%	16.00
prairie dropseed	*Sporobolus heterolepis*	0.29	0.26	2.32%	1.50
	Total Grasses	**8.07**	**7.20**	**65.28%**	**75.04**
butterfly milkweed	*Asclepias tuberosa*	0.07	0.06	0.52%	0.09
whorled milkweed	*Asclepias verticillata*	0.01	0.01	0.11%	0.05
bird's foot coreopsis	*Coreopsis palmata*	0.06	0.05	0.50%	0.20
white prairie clover	*Dalea candida*	0.10	0.09	0.78%	0.60
purple prairie clover	*Dalea purpurea*	0.17	0.15	1.32%	0.80
ox-eye	*Heliopsis helianthoides*	0.07	0.06	0.51%	0.13
round-headed bush clover	*Lespedeza capitata*	0.03	0.03	0.31%	0.10
tough blazing star	*Liatris aspera*	0.02	0.02	0.17%	0.11
dotted blazing star	*Liatris punctata*	0.02	0.02	0.23%	0.06
wild bergamot	*Monarda fistulosa*	0.03	0.03	0.30%	0.85
horsemint	*Monarda punctata*	0.02	0.02	0.22%	0.80
stiff goldenrod	*Oligoneuron rigidum*	0.07	0.06	0.59%	0.98
large-flowered beard tongue	*Pentstemon grandiflorus*	0.04	0.04	0.35%	0.20
black-eyed susan	*Rudbeckia hirta*	0.10	0.09	0.86%	3.20
gray goldenrod	*solidago nemoralis*	0.01	0.01	0.14%	1.65
skyblue aster	*Symphyotrichum oolentangiense*	0.01	0.01	0.06%	0.20
silky aster	*Symphyotrichum sericeum*	0.02	0.02	0.19%	0.20
bracted spiderwort	*Tradescantia bracteata*	0.01	0.01	0.12%	0.05
heart-leaved alexanders	*Zizia aptera*	0.02	0.02	0.21%	0.10
	Total Forbs	**0.90**	**0.80**	**7.49%**	**10.37**
Oats	*Avena sativa*	3.36	3.00	27.23%	1.33
	Total Cover Crop	**3.36**	**3.00**	**27.23%**	**1.33**
	Totals:	**12.33**	**11.00**	**100.00%**	**86.75**
Purpose:	Regional dry prairie reconstruction for wetland mitigation, ecological restoration or conservation program plantings.				
Planting Area:	Eastern Broadleaf Forest Province excluding Hardwood Hills subsection. MnDOT Districts Metro & 6.				

35-641 **Mesic Prairie Southeast**

Common Name	Scientific Name	Rate (kg/ha)	Rate (lb/ac)	% of Mix (% by wt)	Seeds/ sq ft
big bluestem	*Andropogon gerardii*	1.01	0.90	7.49%	3.30
side-oats grama	*Bouteloua curtipendula*	1.54	1.37	11.38%	3.01
nodding wild rye	*Elymus canadensis*	1.18	1.05	8.77%	2.01
slender wheatgrass	*Elymus trachycaulus*	1.01	0.90	7.50%	2.28
switchgrass	*Panicum virgatum*	0.24	0.21	1.78%	1.10
little bluestem	*Schizachyrium scoparium*	1.42	1.27	10.59%	7.00
Indian grass	*Sorghastrum nutans*	2.24	2.00	16.68%	8.82
	Total Grasses	**8.63**	**7.70**	**64.19%**	**27.52**
butterfly milkweed	*Asclepias tuberosa*	0.07	0.06	0.53%	0.10
whorled milkweed	*Asclepias verticillata*	0.01	0.01	0.10%	0.05
Canada milk vetch	*Astragalus canadensis*	0.18	0.16	1.33%	1.00
partridge pea	*Chamaecrista fasciculata*	0.67	0.60	5.00%	0.60
white prairie clover	*Dalea candida*	0.01	0.01	0.07%	0.06
purple prairie clover	*Dalea purpurea*	0.10	0.09	0.78%	0.50
Canada tick trefoil	*Desmodium canadense*	0.17	0.15	1.24%	0.30
ox-eye	*Heliopsis helianthoides*	0.05	0.05	0.43%	0.12
tough blazing star	*Liatris aspera*	0.03	0.03	0.21%	0.15
great blazing star	*Liatris pycnostachya*	0.03	0.03	0.29%	0.14
wild bergamot	*Monarda fistulosa*	0.01	0.01	0.06%	0.18
stiff goldenrod	*Oligoneuron rigidum*	0.02	0.02	0.17%	0.31
gray-headed coneflower	*Ratibida pinnata*	0.02	0.02	0.15%	0.20
black-eyed susan	*Rudbeckia hirta*	0.06	0.05	0.38%	1.54
heart aster	*Symphyotrichum cordatum*	0.01	0.01	0.05%	0.40
smooth aster	*Symphyotrichum laeve*	0.05	0.05	0.41%	1.00
bracted spiderwort	*Tradescantia bracteata*	0.04	0.04	0.34%	0.15
blue vervain	*Verbena hastata*	0.04	0.04	0.37%	1.50
hoary vervain	*Verbena stricta*	0.11	0.10	0.85%	1.05
golden alexanders	*Zizia aurea*	0.08	0.07	0.60%	0.29
	Total Forbs	**1.79**	**1.60**	**13.34%**	**9.64**
Oats	*Avena sativa*	3.03	2.70	22.47%	1.20
	Total Cover Crop	**3.03**	**2.70**	**22.47%**	**1.20**
	Totals	**13.45**	**12.00**	**100.00%**	**38.36**
Purpose:	Regional mesic prairie reconstruction for wetland mitigation, ecological restoration, or conservation program plantings.				
Planting Area:	Eastern Broadleaf Forest Province excluding Hardwood Hills subsection. MnDOT Districts Metro & 6.				

36-211 **Woodland Edge South & West**

Common Name	Scientific Name	Rate (kg/ha)	Rate (lb/ac)	% of Mix (% by wt)	Seeds/ sq ft
big bluestem	*Andropogon gerardii*	1.12	1.00	2.90%	3.68
side-oats grama	*Bouteloua curtipendula*	1.12	1.00	2.89%	2.20
Kalm's brome	*Bromus kalmii*	1.68	1.50	4.34%	4.40
nodding wild rye	*Elymus canadensis*	1.40	1.25	3.61%	2.38
bottlebrush grass	*Elymus hystrix*	0.36	0.32	0.91%	0.88
slender wheatgrass	*Elymus trachycaulus*	1.40	1.25	3.64%	3.18
switchgrass	*Panicum virgatum*	0.07	0.06	0.17%	0.20
little bluestem	*Schizachyrium scoparium*	0.69	0.62	1.79%	3.40
Indian grass	*Sorghastrum nutans*	1.12	1.00	2.88%	4.40
	Total Grasses	**8.97**	**8.00**	**23.14%**	**24.82**
common yarrow	*Achillea millefolium*	0.03	0.03	0.09%	2.00
blue giant hyssop	*Agastache foeniculum*	0.11	0.10	0.28%	3.20
white snakeroot	*Ageratina altissima*	0.03	0.03	0.09%	1.70
white prairie clover	*Dalea candida*	0.19	0.17	0.50%	1.20
Canada tick trefoil	*Desmodium canadense*	0.16	0.14	0.42%	0.29
ox-eye	*Heliopsis helianthoides*	0.15	0.13	0.38%	0.33
wild bergamot	*Monarda fistulosa*	0.07	0.06	0.18%	1.60
stiff goldenrod	*Oligoneuron rigidum*	0.07	0.06	0.17%	0.90
Clayton's sweet clover	*Osmorhiza claytonii*	0.07	0.06	0.17%	0.66
smooth wild rose	*Rosa blanda*	0.07	0.06	0.17%	0.66
black-eyed susan	*Rudbeckia hirta*	0.20	0.18	0.52%	8.10
Lance-leaved Figwort	*Scrophularia lanceolata*	0.06	0.05	0.14%	3.20
zigzag goldenrod	*Solidago flexicaulis*	0.02	0.02	0.05%	0.50
showy goldenrod	*Solidago speciosa*	0.07	0.06	0.18%	1.80
smooth aster	*Symphyotrichum laeve*	0.07	0.06	0.19%	1.30
American vetch	*Vicia americana*	0.20	0.18	0.52%	0.14
golden alexanders	*Zizia aurea*	0.12	0.11	0.33%	0.66
	Total Forbs	**1.68**	**1.50**	**4.34%**	**24.80**
Oats	*Avena sativa*	28.02	25.00	72.48%	11.14
	Total Cover Crop	**28.02**	**25.00**	**72.48%**	**11.14**
	Totals	**38.67**	**34.50**	**100.00%**	**60.75**
Purpose:	Partly shaded grassland planting for native roadsides, reclamation, etc.				
Planting Area:	Tallgrass Aspen Parklands, Prairie Parkland, and Eastern Broadleaf Forest Provinces. MnDOT Districts 2(west), 3B, 4, Metro, 6, 7 & 8				

36-311 **Woodland Edge Northeast**

		Rate	Rate	% of Mix (%	Seeds/ sq

Common Name	Scientific Name	Rate (kg/ha)	Rate (lb/ac)	% of Mix (% by wt)	Seeds/ sq ft
fringed brome	*Bromus ciliatus*	2.24	2.00	5.98%	8.10
bluejoint	*Calamagrostis canadensis*	0.15	0.13	0.37%	12.90
poverty grass	*Danthonia spicata*	0.56	0.50	1.50%	4.60
nodding wild rye	*Elymus canadensis*	1.40	1.25	3.72%	2.38
slender wheatgrass	*Elymus trachycaulus*	2.24	2.00	5.96%	5.06
Kentucky bluegrass	*Poa pratensis*	0.98	0.87	2.59%	41.50
False Melic	*Schizachne purpurascens*	0.28	0.25	0.75%	2.50
	Total Grasses	**7.88**	**7.00**	**20.87%**	**77.44**
common yarrow	*Achillea millefolium*	0.03	0.03	0.09%	2.00
pearly everlasting	*Anaphalis margaritacea*	0.02	0.02	0.05%	1.10
flat-topped aster	*Doellingeria umbellata*	0.04	0.04	0.12%	1.00
Tall coreopsis	*Coreopsis tripteris*	0.07	0.06	0.19%	5.30
large-leaved aster	*Eurybia macrophylla*	0.02	0.02	0.05%	0.18
tall goldenrod	*Oligoneuron rigidum*	0.16	0.14	0.42%	2.10
smooth wild rose	*Rosa blanda*	0.16	0.15	0.47%	0.15
black-eyed susan	*Rudbeckia hirta*	0.29	0.26	0.77%	8.70
gray goldenrod	*Solidago nemoralis*	0.07	0.06	0.18%	0.60
upland white aster	*Solidago ptarmicoides*	0.04	0.04	0.13%	1.00
Lindley's Aster	*Symphyotrichum ciliatum*	0.03	0.03	0.10%	1.00
smooth aster	*Symphyotrichum laeve*	0.16	0.14	0.43%	2.90
American vetch	*Vicia americana*	0.56	0.50	1.50%	0.38
	Total Forbs	**1.68**	**1.50**	**4.50%**	**32.81**
Oats	*Avena sativa*	28.02	25.00	74.63%	11.14
	Total Cover Crop	**28.02**	**25.00**	**74.63%**	**11.14**
	Totals:	**37.58**	**33.50**	**100.00%**	**121.39**
Purpose:	Partly shaded grassland planting for native roadsides, reclamation, etc in north-central and northeast MN				
Planting Area:	Laurentian Mixed Forest Province including Chippewa Plains, Pine Moraines & Outwash Plains, and Mille Lacs Uplands subsections, MnDOT Districts 1 & 2(east)				

36-411 **Woodland Edge Northwest**

Common Name	Scientific Name	Rate (kg/ha)	Rate (lb/ac)	% of Mix (% by wt)	Seeds/ sq ft
big bluestem	*Andropogon gerardii*	0.56	0.50	1.42%	1.35
side-oats grama	*Bouteloua curtipendula*	1.12	1.00	2.81%	2.20
fringed brome	*Bromus ciliatus*	0.84	0.75	2.12%	3.04
kalm's brome	*Bromus kalmii*	2.24	2.00	5.64%	5.88
bluejoint	*Calamagrostis canadensis*	0.07	0.06	0.18%	9.40
poverty grass	*Danthonia spicata*	0.43	0.38	1.06%	3.40
nodding wild rye	*Elymus canadensis*	1.12	1.00	2.81%	1.91
slender wheatgrass	*Elymus trachycaulus*	1.12	1.00	2.81%	2.53
virginia wild rye	*Elymus virginicus*	1.96	1.75	4.93%	2.70
little bluestem	*Schizachyrium scoparium*	0.07	0.06	0.18%	0.35
indian grass	*Sorghastrum nutans*	0.56	0.50	1.40%	2.15
	Total Grasses	**10.09**	**9.00**	**25.36%**	**32.50**
common yarrow	*Achillea millefolium*	0.03	0.03	0.09%	2.00
blue giant hyssop	*Agastache foeniculum*	0.12	0.12	0.35%	4.10
lead plant	*Amorpha canescens*	0.03	0.03	0.09%	0.15
Tall Thimbleweed	*Anemone virginiana*	0.03	0.03	0.08%	0.30
columbine	*Aquilegia canadensis*	0.03	0.03	0.08%	0.40
prairie sage	*Artemisia ludoviciana*	0.03	0.03	0.09%	2.90
white prairie clover	*Dalea candida*	0.07	0.06	0.18%	0.40
purple prairie clover	*Dalea purpurea*	0.20	0.18	0.51%	1.00
flat-topped aster	*Doellingeria umbellata*	0.03	0.03	0.09%	0.80
ox-eye	*Heliopsis helianthoides*	0.04	0.04	0.12%	0.10
tall goldenrod	*Oligoneuron rigidum*	0.07	0.06	0.17%	0.91
smooth wild rose	*Rosa blanda*	0.11	0.10	0.28%	0.10
black-eyed susan	*Rudbeckia hirta*	0.35	0.31	0.88%	10.35
upland white aster	*Solidago ptarmicoides*	0.07	0.06	0.16%	1.30
tall meadow rue	*Thalictrum dasycarpum*	0.15	0.13	0.35%	0.92
American vetch	*Vicia americana*	0.15	0.13	0.37%	0.10
golden alexanders	*Zizia aurea*	0.15	0.13	0.36%	0.51
	Total Forbs	**1.68**	**1.50**	**4.21%**	**26.33**
Oats	*Avena sativa*	28.02	25.00	70.43%	11.14
	Total Cover Crop	**28.02**	**25.00**	**70.43%**	**11.14**
	Totals:	**39.79**	**35.50**	**100.00%**	**69.96**
Purpose:	Partly shaded grassland planting for native roadsides, reclamation, etc.				
Planting Area:	Tallgrass Aspen Parklands Province, MnDOT District 2(west)				

36-711 **Woodland Edge Central**

Common Name	Scientific Name	Rate (kg/ha)	Rate (lb/ac)	% of Mix (% by wt)	Seeds/ sq ft
big bluestem	*Andropogon gerardii*	0.56	0.50	1.42%	1.35
side-oats grama	*Bouteloua curtipendula*	1.12	1.00	2.81%	2.20
fringed brome	*Bromus ciliatus*	0.56	0.50	1.39%	2.00
kalm's brome	*Bromus kalmii*	1.68	1.50	4.22%	4.40
poverty grass	*Danthonia spicata*	0.41	0.37	1.04%	3.40
nodding wild rye	*Elymus canadensis*	0.84	0.75	2.11%	1.43
slender wheatgrass	*Elymus trachycaulus*	1.12	1.00	2.81%	2.53
Virginia wild rye	*Elymus virginicus*	1.96	1.75	4.93%	2.70
little bluestem	*Schizachyrium scoparium*	1.27	1.13	3.17%	6.20
Indian grass	*Sorghastrum nutans*	0.56	0.50	1.41%	2.20
	Total Grasses	**10.09**	**9.00**	**25.31%**	**28.91**
common yarrow	*Achillea millefolium*	0.03	0.03	0.09%	2.00
blue giant hyssop	*Agastache foeniculum*	0.07	0.06	0.18%	2.10
lead plant	*Amorpha canescens*	0.03	0.03	0.13%	0.21
pearly everlasting	*Anaphalis margaritacea*	0.02	0.02	0.05%	1.10
Canada milk vetch	*Astragalus canadensis*	0.28	0.25	0.71%	1.54
white prairie clover	*Dalea candida*	0.07	0.06	0.16%	0.40
purple prairie clover	*Dalea purpurea*	0.20	0.18	0.51%	1.00
ox-eye	*Heliopsis helianthoides*	0.15	0.13	0.37%	0.30
round-headed bush clover	*Lespedeza capitata*	0.08	0.07	0.19%	0.20
wild bergamot	*Monarda fistulosa*	0.07	0.06	0.18%	1.60
Canyon's sweet cicely	*Osmorhiza claytonii*	0.07	0.06	0.17%	0.06
smooth wild rose	*Rosa blanda*	0.10	0.09	0.27%	0.09
black-eyed susan	*Rudbeckia hirta*	0.22	0.20	0.57%	6.80
showy goldenrod	*Solidago speciosa*	0.07	0.06	0.17%	1.80
smooth aster	*Symphyotrichum laeve*	0.07	0.06	0.18%	1.30
skyblue aster	*Symphyotrichum oolentangiense*	0.07	0.06	0.17%	1.80
golden alexanders	*Zizia aurea*	0.07	0.06	0.16%	0.23
	Total Forbs	**1.68**	**1.50**	**4.26%**	**22.77**
Oats	*Avena sativa*	28.02	25.00	70.43%	11.14
	Total Cover Crop	**28.02**	**25.00**	**70.43%**	**11.14**
	Totals:	**39.79**	**35.50**	**100.00%**	**62.81**
Purpose:	Partly shaded grassland planting for native roadsides, reclamation, etc.				
Planting Area:	Chippewa Plains, Pine Moraines & Outwash Plains, and Mille Lacs Uplands subsections, MnDOT Districts 2(southeast) & 3A.				

BIBLIOGRAPHY

Loretta Cartner

AS – Geology, Flathead Valley Community College, Montana. 1987.

BS – Geological Engineering, Montana College of Mineral Science and Technology, 1989.

Work experience: US Forest Service, 1979-2011. Michigan, Montana, Idaho, Nevada, Minnesota. Forestry Technician, Hydrology Technician, Geological Engineer, Mineral Management Specialist.

Technician experience: forest inventory, forest stand inventory and regeneration contract inspection, stream surveys, water quality sampling and analysis, forest firefighting.

Professional experience:

- Rock quarries - geologic mapping, exploration trenching and drilling, quarry design, development and reclamation;
- Slope stability - geologic, soils and hydrologic mapping, slope stability analysis and design, retaining wall design.
- Mineral exploration and mine project administration - environmental analysis, permit processing including mitigation development, reclamation design, reclamation seed mix design, compliance inspection, hydrocarbon spill remediation, reclamation bond calculation and management, reclamation monitoring, water quality sampling, mine closure contracts.
- Watershed projects - mapping and surveying, vegetation inventory, stabilization project design, implementation, and monitoring.
- Transportation planning - watershed based roads analysis, environmental analysis, inventory and mapping of roads, road closure and mitigation design.
- Cave management - cave inventory, special use permitting, bat friendly gate installation.
- Hazardous materials: management of a heavy crude oil spill along a state highway.
- Forest fires - Resource specialist, burned area emergency rehabilitation team leader, fire rehabilitation design, contract development and implementation, reclamation seed mix design, slope stability analysis, slope erosion control.

Dr. Elizabeth Dugan

Dr. Dugan is a retired Molecular Biologist with over 20 years of experience as a volunteer in Outdoor Environmental Education at Ann Arbor, Michigan. Since moving to Minnesota three years ago, Dr. Dugan became a Minnesota Master Naturalist, Board member of Wild Ones, a national organization promoting native plants and natural landscapes.

Dr. J. Sanford Dugan

Dr. J. Sanford Dugan is Professor Emeritus of French at Eastern Michigan University. After moving to Carlton County three years ago, he has been a volunteer on a certified organic farm, has invested in another organic farm, and has read widely on sustainable economies

Janaki Fisher-Merritt

Janaki Fisher-Merritt owns and operates the Food Farm, a 360 acre certified organic vegetable farm located in Wrenshall, 25 miles southwest of Duluth. The Food Farm has raised vegetables since 1975, has been certified organic since 1990, and in 1993 became the first Community Supported Agriculture (CSA) farm serving the Duluth area. The Food Farm currently serves nearly 400 CSA members as well as the Whole Foods Co-op, Duluth Grill, Chester Creek Café, Essentia Health, University of Minnesota Duluth, and a number of other food businesses. The farm and the Fisher-Merritts have received many awards over the years, most recently the 2013 Soil Health Conservationist from the Carlton County Soil and Water Conservation District and Farmer of the Year in 2010 by the Midwest Organic and Sustainable Education Service, awarded at the largest organic farming conference in the United States. Janaki has been a presenter at the MOSES conference, the Sustainable Farming Association of Minnesota annual meeting, the Minnesota Organic Farming Conference, the Minnesota Fruit and Vegetable Growers Association conference and many other workshops and educational events. Janaki graduated Magna cum Laude with a B.A. in Sociology and Anthropology from Carleton College in 1999. He became active in the Wrenshall community upon returning to full-time farming in 2000 and has served on the Carlton County Economic Development Advisory Committee, the Lake Superior Sustainable Farming Association board and a number of other committees. He has been the secretary of the Wrenshall Community Development Corporation since 2003 and a member of the Wrenshall School Board of Education since 2004, currently serving as treasurer. He and his wife started the Free Range Film Festival in 2004, showing independent films in their barn each July.

Craig R. Sterle

Mr. Sterle has an AAS in Natural Resource Management from Muskingum Area Technical College in Zanesville OH, a BS in Forest Resource Management from the University of Minnesota, in St. Paul. As a college student he worked seasonally for the City of Duluth Parks and Recreation Dept. and the US Forest Service in Whitehall MT. Upon graduation, he worked for the St. Louis County Land Dept. as a Forest Technician, and for 32+ years as a Forester for the MN DNR-Division of Forestry, retiring as an Asst. Area Supervisor in Cloquet. As a DNR Forester: he worked in and led the timber sales, forest development, and roads programs for the Area; he was lead law enforcement officer in the Area; served as a team member in development of the North Shore-Laurentian-Toimi Upland Subsection Forest Plan (SFRMP); he was in charge of Wildfire Pre-suppression and Planning; and he taught wildland firefighting courses for almost two decades.

MIDWEST ORGANIC
& Sustainable Education Service
MOSES

PO Box 339 | Spring Valley, WI 54767 | Phone: 715-778-5775 | www.mosesorganic.org

Dr. Burl Haar, Executive Secretary
Minnesota Public Utilities Commission
121 7th Place East, Suite 350
Saint Paul, MN 55101-2147
Re: Docket number 13-474
March 28, 2014
Dear Dr. Haar,

I am writing to express my opposition to the proposed sandpiper pipeline to run through the organic farm of John, Jane and Janaki Fisher Merritt, known as the Food Farm. Their farm is located near Cloquet, MN. My understanding is the Enbridge company has submitted a different route that does not cross the valuable and irreplaceable organic land owned by the Fisher Merritts and instead follows and existing pipeline route in the eastern part of Carlton County. The eastern Carlton County route is the preferred route and the one that your commission should approve.

The Fisher Merritts have held the title of "MOSES Organic Farmer of the Year", a high profile award given annually at the largest Organic Farming Conference in North America. They received this award for the outstanding land stewardship they perform on their working lands, as well as the help they provide to aspiring farmers. John Fisher Merritt has been a mentor in the yearlong MOSES farmer to farmer mentoring program, for each of the seven years that we have had this program. Numerous young farmers have developed a strong foundation in agriculture, due to his tutelage.

Agricultural production in Northern Minnesota is not easy, however, the Fisher Merritts have developed systems that provide fresh and stored vegetable crops to their community. They supply tons of carrots, squash, potatoes and other crops through the cold Minnesota winters in addition to fresh vegetables during the spring, summer and fall. They accomplish their exceptional yields of high quality produce through careful consideration that builds soil as well as protects biodiversity. The many decades of work to build their soil will be destroyed forever, by the digging and damage a pipeline would cause. In addition their organic certification, an important marketing tool, could be jeopardized by both the construction of the pipeline and any accidents that may occur in the future. It is their type of operation that should be cherished, and not destroyed, in order to have true homeland security. What is more important that having a stable, sustainable and healthy food supply? This agricultural gem of the North Country must not be compromised.

My understanding is that there is a mitigation agreement that requires the Minnesota Public Utilities Commission and pipeline companies to do all they can to avoid running pipelines through organic lands. This agreement should be put in place now, to protect Food Farm for this generation, as well as future generations. John and Jane's son Janaki is taking over the family farm, and he should be able to continue the tradition of supplying organic vegetables and livestock products to thousands of consumers in Northern Minnesota for the next 50 years and beyond.

The Midwest Organic and Sustainable Education Service (MOSES) is an education-outreach organization working to promote sustainable and organic agriculture. MOSES serves farmers striving to produce high-quality, healthful food using organic and sustainable techniques. These farmers produce more than just food; they support thriving ecosystems and vibrant rural communities.

Sincerely,

Harriet Behar

Harriet Behar
MOSES Organic Specialist
Home office: 43299 Patton Road Gays Mills, WI 54631
harriet@mosesorganic.org

Jane Fisher-Merritt

From: Sharon Murphy <smurphy@wholefoods.coop>
Sent: Wednesday, March 26, 2014 2:37 PM
To: PublicComments.puc@state.mn.us
Subject: Routing Permit #13-474

Thank you for accepting public comments on the route for the Enbridge Sandpiper pipeline. The Enbridge amended preferred route which avoids passing through or near the Food Farm (Wrenshall) and follows existing pipelines for five miles in the eastern part of Carlton County is a significant improvement in the route for this area.

On behalf of a food cooperative with 8,000 Owners in the Duluth area, it is very important to Whole Foods Co-op, to our community of consumers of locally and sustainably grown food, and to our environment that there be no degradation or diminishment of land available for Food Farm, Northern Harvest Farm and other growers in Carlton County.

This isn't just about money. This is about preserving sustainable agriculture, growing the capacity of our region to feed its residents, and ensuring the health of the ecosystems surrounding Lake Superior.

Sharon Murphy
General Manager
Whole Foods Co-op
610 East 4th Street
Duluth, MN 55805
smurphy@wholefoods.coop

Dr. Burl Harr, Ex. Sec.
MN PUC
121 7th PL E Suite 350
St. Paul, MN 55101-2147

Re: Docket number 13-474

P.O. Box 821 , 122 W. Jefferson Street , Viroqua , Wisconsin 54665
mosa@mosaorganic.org ■ 608.637.2526| phone ■ 608.637.7032| fax

Dear Dr. Harr,
This letter supports opposition to routing the Sandpiper Project through organic or transitioning-to-organic land.

Janaki Fisher-Merritt
2612 County Rd 1
Wrenshall, MN 55797

Dear Janaki, 3/26/2014

A proposed pipeline route may impact your organic farm. You requested that MOSA write a letter regarding how a disturbance on your organic farm could impact the certification of your land. You may share this letter as you see fit.

Certified Organic operations are responsible for maintaining a detailed Organic System Plan (OSP). This OSP represents the operator's plan for meeting the National Organic Standards and maintaining the organic integrity of the operation. The OSP is updated and verified annually by the organic certification agency and addresses all aspects of management including crop fertility, soil and water conservation, crop rotation, weed, pest, and disease management, adjoining land use (including buffers that are required), pest control, equipment use, crop storage, handling, transportation, marketing, labeling, and recordkeeping.

Organic production is defined as a production system managed by "integrating cultural, biological, and mechanical practices that foster cycling of resources, promote ecological balance, and conserve biodiversity." Organic producers are responsible for demonstrating how production practices maintain or improve the natural resources of the operation and minimize erosion.

Fallow or wild land, as well as production acres, are very important as part of the organic system as a whole. They may be considered part of the productivity of the system. These areas serve as habitat for beneficial insects (such as pollinators or pest predators), birds, wildlife, and soil biota that support the overall biodiversity of the system and this land may be used as part of the crop rotation. Additionally, wild land can be certified for organic wild crop harvests (such as mushrooms, ramps, berries, herbs, etc.).

A disturbance of this land could impact the productivity of the overall system and impact organic certification in at least the following ways:
1) Soil organic matter and structure is an important foundation of organic productivity. Heavy equipment can compact soil and decrease the productivity of soil. The movement of soil destroys soil structure and may induce erosion. The movement of non-organic soil (as fill or on equipment tires) onto organic land can impact organic certification.
2) The application of herbicides or other chemicals that are prohibited by the National Organic

Standards would result in the land becoming contaminated. A 36 month transition would be required from the date of application. Additional buffering of organic land may be required, taking land out of production.

3) A leak of oil or other chemicals from the pipeline may make land ineligible for certification.

4) Biodiversity of the overall habitat would be impacted.

5) The process of reseeding disturbed land must use approved seeds and substances. Plastic mesh that stays in place or treated seed are prohibited.

Feel free to contact me with any further questions.

Sincerely,

Lynne Haynor

Lynne Haynor
Certification Specialist