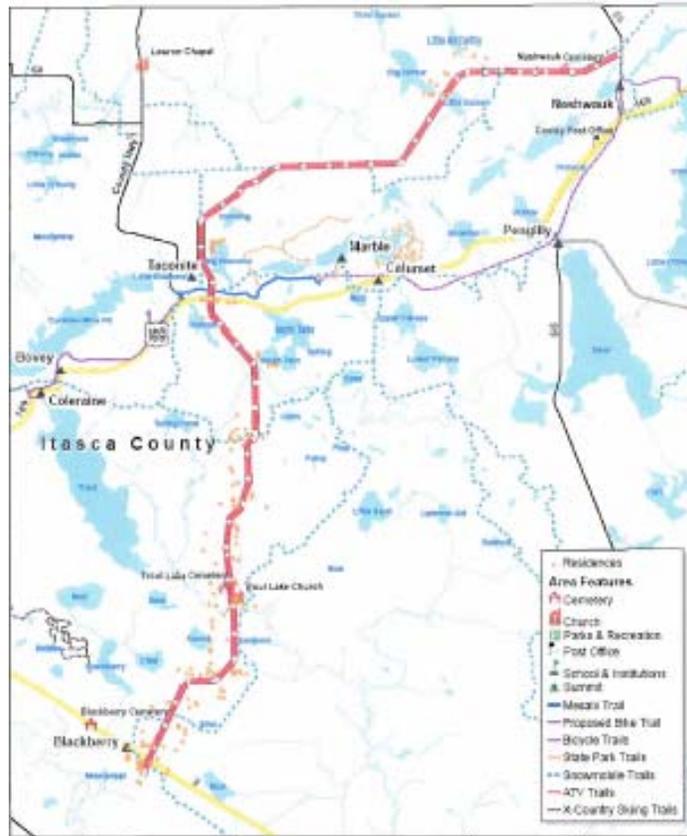


**COMPARATIVE ENVIRONMENTAL ANALYSIS**  
**NPUC BLACKBERRY – NASHWUAK PIPELINE PROJECT**

**PUC DOCKET NO. PL E280/GP-06-1481**



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**December 21, 2007**

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**Abstract**

Nashwauk Public Utilities Commission (NPUC) has submitted a Pipeline Routing Permit Application for its proposed Blackberry to Nashwauk pipeline project.

Persons interested in receiving additional information regarding this matter can register their names on the Project Docket webpage at:

<http://energyfacilities.puc.state.mn.us/Docket.html?Id=19035>

or by contacting Bill Storm, Energy Facilities Permitting, 85 7<sup>th</sup> Place East, Suite 500, St. Paul, Minnesota 55101, phone (651) 296-9535, e-mail: [bill.storm@state.mn.us](mailto:bill.storm@state.mn.us).

Many of the documents of interest regarding this matter, including the pipeline routing permit application; public and agency comment letters and this Comparative Environmental Analysis, are available online at the above webpage.

## **1.0 Introduction**

The Nashwauk Public Utilities Commission (NPUC) is proposing to construct and operate a 24 inch natural gas pipeline in Itasca County, Minnesota. This document contains the analysis of the various alternative routes accepted for consideration at the public hearing by the Minnesota Public Utilities Commission (Commission), per Minnesota Rule 7852.1500.

### ***Project Area***

The proposed Nashwauk to Blackberry pipeline project is located within a semi-rural area of southeastern Itasca County in northeastern Minnesota. The area is a mix of forested land, mineland, wetlands, pasture and small farms. The proposed pipeline route will cross portions of the cities of Taconite and Nashwauk. Approximately 42 percent of the route is farm-residential, 7 percent is municipal, and 51 percent is industrial. Rich iron ore deposits cover much of this area and there is a long history of past and present mining activities in the area.

### ***Project Description***

The proposed pipeline will start at the existing Great Lakes Gas (GLG) 36 inch natural gas pipeline until reaching the termination point in the city of Nashwauk near the proposed new Minnesota Steel plant. To the maximum extent possible the pipeline will run adjacent to existing utilities, including railroads, natural gas pipelines, electric transmission lines, highways and roads located in Itasca County.

The proposed Nashwauk to Blackberry pipeline project will provide natural gas fuel required to operate the Minnesota Steel Nashwauk Taconite Reduction Plant and other industrial customers near the city of Nashwauk. The proposed pipeline will provide natural gas service to Minnesota Steel's plant for use in the processing of taconite and other plant operations. A Final Environmental Impact Statement for the proposed Minnesota Steel Nashwauk Taconite Reduction Plant has been released by the Minnesota Department of Natural Resources. NPUC will be seeking other industrial customers in the future, so the proposed gas pipeline is being sized to allow for industrial expansion near Nashwauk.

The pipeline is designed to deliver natural gas at a maximum rate of 206 million cubic feet per day and is planned to operate at a pressure of 599 pounds per square inch gauge (psig). The Maximum Allowable Operating Pressure of the pipe will be 1016 psig.

The pipeline requires a separate permit and environmental analysis from the Minnesota Public Utilities Commission (Commission).

### ***Regulatory Process and Procedures***

Minn. Stat. 216G.02 requires a pipeline routing permit from the PUC to construct certain intrastate natural gas and petroleum pipelines in Minnesota. The statute was passed in 1987. In 1989, the EQB adopted rules implementing the pipeline routing requirements (Minn. Rules Chapter 7852).

The 2005 Minnesota Laws transferred EQB jurisdiction over the permitting of pipelines to the PUC, which includes pipelines with a diameter of six inches or more that are designed to transport hazardous liquids like crude petroleum and those that are designed to carry natural gas and be operated at a pressure of more than 275 pounds per square inch.

There are two review procedures available to applicants for obtaining a pipeline routing permit:

A) **Partial Exemption.** An applicant may apply for a “Partial Exemption from Pipeline Route Selection Procedures” if the project is not expected to have significant environmental impacts. In such a case, the process normally takes from 60 to 120 days from acceptance of the application to completion.

B) **Pipeline Route Selection Procedures.** For larger or more controversial projects with expected significant environmental impacts, a more complex process is required and is referred to as “Pipeline Route Selection Procedures.” It can take up to nine months to complete from the time the application is accepted.

***Background (“Process to date”)***

On March 6, 2007, Nashwuak Public Utilities Commission (NPUC) filed an application for a pipeline routing permit and partial exemption from pipeline route selection procedures for the Nashwuak to Blackberry natural gas pipeline project.

The Commission released an order that accepted the NPUC application under the partial exemption rules as complete on April 3, 2007,.

A public information meeting was held at the Taconite Community Center concerning the proposed Nashwuak to Blackberry pipeline route permit application on Wednesday, April 18, 2007. The public had until May 18, 2007, to submit comments on the project and application. Due to some procedural issues associated with the notice for the initial public meeting, a second public information meeting was held on May 24, 2007, at the Nashwuak City Hall. The public comment period was extended to June 8, 2007.

Approximately 50 people attended the second information meeting; a variety of questions were asked and comments made by the attendees. While concerns raised included safety of the pipeline, impact on property values, limitations on the use of pipeline easements, and compensation to land owners, the major issues seemed to be the lack of discussion on alternative routes contained within the application and a desire to have a citizen advisory committee (CAC) established.

On July 12, 2007, the NPUC submitted a request to the Commission to convert its original application for a partial exemption into a full proceeding pursuant to Minn. Rule 4415.045. NPUC submitted a revised pipeline routing permit application incorporating the requirements of the full Pipeline Route Selection Procedures on July 27, 2007.

In its request, NPUC sought review under the pipeline route selection procedures which is approximately a nine month permitting process. The requirements of this process are in Minnesota Rules 7852.2000 through 7852.3100 and are different in several respects from the shorter partial exemption process.

- Under the full process, the applicant must include information in the application regarding consideration of alternative routes and the reasons for rejecting the alternative routes (Minn.

Rules part 7852.3100). Procedurally, the process begins like the partial exemption request with notice to the public of the application and the scheduling of a public meeting.

- In the full process the Commission must identify alternative routes to consider as part of the deliberations.
- The Commission must prepare a *comparative environmental analysis* of all the pipeline routes identified for consideration as part of the full process. Minn. Rules part 7852.1500.
- A second round of public meetings is required to explain the process to the public, present major issues, and respond to questions.
- Following the public meetings, a contested case hearing must be held, presided over by an administrative law judge. Minn. Rules part 7852.1700. Upon completion of the hearing, the matter comes to the Commission for a final decision.

On August 23, 2007, the Commission released an order that granted NPUC's request to convert the current docket to the full review process, accepted the revised application as complete, and authorized the Department to establish a CAC.

On August 28, 2007, the Department held a third public meeting at the Taconite Community Center to inform the public of the conversion to the full review process, receive comments on route alternatives or modifications, and to solicit input into the components of the comparative environmental analysis. Approximately 32 people attended this public meeting, two of whom spoke during the open forum portion. The comments/issues raised included:

- minimum distance from housing that a pipeline can be routed by;
- who is the responsible entity should an environmental problem arise;
- can access to the pipeline ROW be restricted to authorized users by a fence/gate system;
- who is the natural gas going to be sold to;
- can the abandoned pipeline ROW along highway 169 be utilized;

The first meeting of the CAC also took place on this date. The Citizens Advisory Committee met three times from August 2007 to October 2007. The meetings were open to the public, and frequently additional people attended to listen to the discussion. The committee, through a facilitated process, discussed and made recommendations to the Commissioner of Commerce following the charge given to the task force. The CAC released its report on October 24, 2007.

## **2.0 PUC Accepted Routes**

On December 7, 2007, the Commission released an order determining which routes and route segments would be considered in the contested case hearing. The pipeline route alternatives selected for consideration at the public hearing are illustrated on **Figure 1**.

With the exception of the Citizens Alternative Route Segment, the possible routes for the proposed Nashwauk to Blackberry natural gas pipeline and the associated facility improvements are described

more specifically in NPUC's pipeline route permit application. The following presents a brief description of the preferred and alternative routes. NPUC requested a route width of 1320 feet, 660 feet on either side of the pipeline centerline.

All alternative routes accepted for consideration by the Commission were evaluated relative to an anticipated centerline and a route width of 660 feet on either side of that centerline.

### ***ICMSI-1 (alternative 1)***

This route is color coded yellow on the map illustrating the various routes (**Figure 1**). Alternative 1 (ICMSI-1) was originally identified in the Itasca County Infrastructure plan. Alternative 1 extends 25.94 miles from a point west of Cohasset, Minnesota, to the termination point, approximately 7.1 miles north and 22.6 miles east, near Nashuak, Minnesota. The alignment traverses east from Cohasset approximately 2.7 miles turning north at County Road 168 for approximately 2.5 miles and then northeast and east approximately 22 miles terminating east of Nashuak, Minnesota. This alternative alignment extends from the northeast  $\frac{1}{4}$  of the northwest  $\frac{1}{4}$  of Section 9, Township 55 North, Range 26 West, Itasca County (Latitude 47.234118, Longitude -93.650705). This alternative alignment terminates in the northeast  $\frac{1}{4}$  of the southwest  $\frac{1}{4}$  of Section 29 in Township 57 North Range 22 West, Itasca County (Latitude 47.384504, Longitude -93.196173).

This route connects to the GLG 36 inch gas mainline west of Grand Rapids. It proceeds west and north following an existing HVTL line for much of its length. The route length is 25.94 miles. The designated pipeline centerline passes within 330 feet of 31 existing residences. The one-eighth mile wide route (+/- 330 feet from centerline) crosses 133 private parcels and 24 public parcels for a total of 142,540 lineal feet of right-of-way (ROW) impacted. The one-quarter mile wide route (+/- 660 feet from the centerline) crosses 319 private parcels for a total of 3,673 acres affected and 39 public parcels for a total of 694 acres affected. This route requires 14 road crossings, one railroad crossing and 10 crossings of intermittent or permanent water bodies. A total of 5.01 miles of this route crosses through 33 unique mapped wetlands.

The cost estimate for Alternative 1 is \$26,232,000. The vast majority of the route crosses small plots of cultivated land and rural residential land, large expanses of wetland and mixed deciduous and coniferous forest. Much of the mixed forest land is broken into small farm or rural residential land classifications. Fifty-four percent of the route crosses smaller plots of cultivated land and rural residential land, 19 percent crosses expanses of wetland, 19 percent crosses municipal areas, 6 percent crosses mixed deciduous and coniferous forest and 2 percent crosses disturbed mine lands.

### ***ICMSI-2 (alternative 2)***

This route is color coded orange on the map illustrating the various routes. Alternative 2 (ICMSI-2) was originally identified in the Itasca County Infrastructure plan. Alternative 2 extends 24.59 miles from a point east of LaPrairie, Minnesota to the termination point, approximately 10.7 miles north and 15.2 miles east, near Nashuak, Minnesota. The alignment traverses east from LaPrairie approximately 7.4 miles where it intersects the preferred alignment. At this point, Alternative 2 turns north for approximately 7 miles and then northeast and east approximately 10.2 miles, terminating east of Nashuak, Minnesota. This alternative alignment extends from the northwest  $\frac{1}{4}$  of the northwest  $\frac{1}{4}$  of Section 10, Township 55 North, Range 25 West, Itasca County (Latitude 47.23624, Longitude -

93.488939). This alternative alignment terminates in the northeast ¼ of the southwest ¼ of Section 29 in Township 57 North Range 22 West, Itasca County (Latitude 47.384504, Longitude -93.196173).

This route connects to the GLG 36 inch gas mainline east of Grand Rapids. It proceeds west and north following an existing highway for part of its length. The route length is 24.59 miles. The designated pipeline centerline passes within 330 feet of 10 existing residences. The one-eighth mile wide route (+/- 330 feet from centerline) crosses 123 private parcels and 14 public parcels for a total of 129,830 lineal feet of ROW impacted. The one-quarter mile wide route (+/- 660 feet from the centerline) crosses 280 private parcels for a total of 3,462 acres affected and 35 public parcels for a total of 498 acres affected. This route requires 12 road crossings, 2 railroad crossings and 9 crossings of intermittent or permanent water bodies. A total of 3.37 miles of this route crosses through 22 unique mapped wetlands.

The cost estimate for this route is \$25,668,000.00. The vast majority of the route crosses small plots of cultivated land and rural residential land, large expanses of wetland and mixed deciduous and coniferous forest. Much of the mixed forest land is broken into small farm or rural residential land classifications. Fifty-two percent of the route crosses smaller plots of cultivated land and rural residential land, 14 percent crosses expanses of wetland, 20 percent crosses municipal areas, 12 percent crosses mixed deciduous and coniferous forest and 2 percent crosses disturbed mine lands.

### ***NPUC Proposed Route (alternative 3)***

This route is color coded red on the map illustrating the various routes. Alternative 3 (NPUC's preferred route) was originally identified in the Itasca County Infrastructure plan. This pipeline route originates in Blackberry Township. It runs almost straight north for 13 miles to an area near Taconite. There, Alternative 3 turns east northeast for approximately 10.5 miles until it reaches Nashuak. The proposed pipeline originates in the northwest ¼ of the southwest ¼ of Section 10, Township 54 North, Range 24 West, Itasca County (Latitude 47.172070, Longitude -93.383398). The proposed natural gas pipeline will terminate in the northeast ¼ of the northeast ¼ of Section 36 in Township 57 North Range 23 West, Itasca County (Latitude 47.384504, Longitude -93.196173).

This route connects to the GLG 36 inch gas mainline southeast of Grand Rapids, along State Highway 2 near its intersection with County Highway 71. It proceeds north and east through mostly undeveloped land for much of its length. The route length is 23.68 miles. The designated pipeline centerline passes within 330 feet of 5 existing residences. The one-eighth mile wide route (+/- 330 feet from centerline) crosses 127 private parcels and 10 public parcels for a total of 125,044 lineal feet of right-of-way (ROW) impacted. The one-quarter mile wide route (+/- 660 feet from the centerline) crosses 259 private parcels for a total of 3,512 acres affected and 24 public parcels for a total of 304 acres affected. This route requires 13 road crossings, 2 railroad crossings and 8 crossings of intermittent or permanent water bodies. A total of 3.33 miles of this route crosses through 26 unique mapped wetlands.

The cost estimate for this route is \$24,289,000.00. The vast majority of Alternative 3 crosses small plots of cultivated land and rural residential, large expanses of wetland and mixed deciduous and coniferous forest. Much of the mixed forest land is broken into small farm or rural residential land classifications. Fifty-six percent of the route crosses smaller plots of cultivated land and rural residential land, 14 percent crosses expanses of wetland, 19 percent crosses municipal areas, 9 percent crosses mixed deciduous and coniferous forest and 2 percent crosses disturbed mine lands.

***Citizen’s Route (alternative P-1)***

This route is color coded light blue on the map illustrating the various routes. Alternative P-1 was developed in response to the citizen comments presented at the two public meetings held as part of the original Partial Exemption proceeding. Alternative P-1 extends 35.44 miles from the GLG 36 inch diameter pipeline south of State Highway 2 in Sago Township southeast of Warba, Minnesota to the termination point, approximately 19.4 miles north and 3 miles west, near Nashwauk, Minnesota. The alignment traverses northeast approximately 19 miles along Highway 65 and Highway 16 and extends just east of the Saint Louis County boundary where it turns west-northwest approximately 8.8 miles to Highway 169, and then northeast along Hwy 169 approximately 4.7 to County Highway 58 and then approximately 5.7 miles west and southwest terminating west of Nashwauk, Minnesota. This alternative alignment extends from the southeast ¼ of the northwest ¼ of Section 13, Township 53 North, Range 23 West, Itasca County (Latitude 47.077883, Longitude -93.202829). This alternative alignment terminates in the southwest ¼ of the southeast ¼ of Section 4 in Township 56 North Range 23 West, Itasca County (Latitude 47.257282, Longitude -93.267021).

This new route connects to the GLG 36 inch gas mainline east of Grand Rapids at State Highway 2 near the border of Sago and Wawina Townships. The proposed pipeline proceeds almost due northeast following Highway 65 and an abandoned railroad line for much of its length. The route length is 35.44 miles. The designated pipeline centerline passes within 330 feet of 79 existing residences. The one-eighth mile wide route (+/-330 feet from centerline) crosses 132 private parcels and 38 public parcels for a total of 187,146 lineal feet of right-of-way (ROW) impacted. The one-quarter mile wide route (+/-660 feet from the centerline) crosses 800 private parcels for a total of 3,196 acres affected and 106 public parcels for a total of 1,599 acres affected. This route requires 23 road crossings, 2 railroad crossings and 17 crossings of intermittent or permanent water bodies. A total of 4.47 miles of this route crosses through 32 unique mapped wetlands.

The cost estimate for this route is \$34,591,000.00. The vast majority of the route crosses small plots of cultivated land and residential land, a largely undeveloped area along the eastern edge of Swan Lake, large expanses of wetland and large areas of mixed deciduous and coniferous forest. This route also proposes to cross through Nashwauk on the narrow isthmus parallel to Highway 65. This route is one of the longer routes identified and presents the technical constraints of having to construct a pipeline within 2000 feet of a mine blasting zone, impacting where route crosses just west of Nashwauk. This route also requires crossing over iron ore deposits north and east of Nashwauk.

Much of the mixed forest land is broken into small farm or rural residential land classifications. Thirty-four percent of the route crosses smaller plots of cultivated land and rural residential land, 13 percent crosses expanses of wetland, 13 percent crosses municipal areas, 37 percent crosses mixed deciduous and coniferous forest and 3 percent crosses disturbed mine lands.

***Citizen’s Route (alternative P-2)***

This route is color coded dark blue on the map illustrating the various routes. Alternative P-2 was developed in response to the citizen comments presented at the two public meetings held as part of the original Partial Exemption proceeding. Alternative P-2 extends 29.9 miles beginning from same terminus as Alternative P-1 at the GLG 36 inch diameter pipeline south of State Highway 2 in Sago Township southeast of Warba, Minnesota and extends to the same termination point, approximately 19.4 miles north and 3 miles west, near Nashwauk, Minnesota. Alternative P-2 traverses northeast,

approximately 19 miles along Highway 65, to Highway 169 where it intersects Alternative P-1. This alternative alignment extends from the southeast  $\frac{1}{4}$  of the northwest  $\frac{1}{4}$  of Section 13, Township 53 North, Range 23 West, Itasca County (Latitude 47.077883, Longitude -93.202829). This alternative alignment terminates in the southwest  $\frac{1}{4}$  of the southeast  $\frac{1}{4}$  of Section 4 in Township 56 North Range 23 West, Itasca County (Latitude 47.257282, Longitude -93.267021).

This new route connects to the large 36 inch gas mainline east of Grand Rapids at State Highway 2 near the border of Sago and Wawina Townships. It proceeds almost due north following Highway 65 for much of its length. The route length is 29.92 miles. The designated pipeline centerline passes within 330 feet of 156 existing residences, the one-eighth mile wide route (+/-330 feet from centerline) crosses 148 private parcels and 34 public parcels for a total of 160,973 lineal feet of right-of-way (ROW) impacted. The one-quarter mile wide route (+/- 660 feet from the centerline) crosses 670 private parcels for a total of 3,913 acres affected and 98 public parcels for a total of 1,349 acres affected. This route requires 31 road crossings, 2 railroad crossings and 10 crossings of intermittent or permanent water bodies. A total of 1.18 miles of this route crosses through 17 unique mapped wetlands.

The cost estimate for this route is \$29,158,000.00. The vast majority of the route crosses small plots of cultivated land and residential land, a developed community along the western edge of Swan Lake, small expanses of wetland and large areas of mixed deciduous and coniferous forest. This route also proposes to cross through Nashuak on the narrow isthmus parallel to Highway 65. This route is one of the longer routes identified and presents the seeming impossibility of having to construct a pipeline within 2000 feet of a mine blasting zone, impacting where route crosses just west of Nashuak. This route also requires crossing over iron ore deposits north and east of Nashuak. Much of the mixed forest land is broken into small farm or rural residential land classifications. 46 percent of the route crosses smaller plots of cultivated land and rural residential land, 4 percent crosses expanses of wetland, 15 percent crosses municipal areas, 31 percent crosses mixed deciduous and coniferous forest and 4 percent crosses disturbed mine lands.

#### ***Citizens Advisory Committee Alternative Route Segment***

This route is color coded purple on the map illustrating the various routes. The CAC alternative route segment was not originally identified in the Itasca County Infrastructure plan. It evolved out of the Citizen Advisory Committee (CAC) examination of the route alternatives and was recommended by the CAC for developing further information.

This route segment was presented in a letter to the Minnesota Department of Commerce. The CAC route follows the existing Alternative route 2 corridor from east of La Prairie for about 7.4 miles to the point where it intersect the preferred Alternative 3. The CAC Route Segment follows Alternative 3 for about  $\frac{3}{4}$  of a mile and then turns to the northeast for about 9 miles where it connects to Alternative Route P-1. From this point on the CAC Route Segment shares the same corridor as Alternative P-1 to the end of the pipeline west of Nashuak, Minnesota. The total length of the CAC Route Segment is 27.12 miles.

The CAC Route Segment extends from the northwest  $\frac{1}{4}$  of the northwest  $\frac{1}{4}$  of Section 10, Township 55 North, Range 25 West, Itasca County (Latitude 47.23624, Longitude -93.488939). This alternative alignment terminates in the southwest  $\frac{1}{4}$  of the southeast  $\frac{1}{4}$  of Section 4 in Township 56 North Range 23 West, Itasca County (Latitude 47.257282, Longitude -93.267021).

The CAC Route Segment passes within 330 feet of 56 existing residences. In terms of the number of parcels intersected by the centerline of the CAC Route Segment, there are 145 private parcels and 58 public parcels. This route segment requires 26 road crossings, 2 active railroad crossings, and 12 crossings of intermittent or permanent water bodies. A total of 2.97 miles of this route crosses through 22 unique mapped wetlands.

The initial cost estimate for this route segment is \$29,000,000.00 based on the estimates for the five other route alternatives. The vast majority of the route crosses small plots of cultivated land, large expanses of wetland and mixed deciduous and coniferous forest. This route also proposes to cross through Nashuak on the narrow isthmus parallel to Highway 65. This route is one of the longer routes identified and presents the seeming impossibility of having to construct a pipeline within 2000 feet of a mine blasting zone, impacting where route crosses just west of Nashuak. This route also requires crossing over iron ore deposits north and east of Nashuak. Much of the mixed forest land is broken into small farm or rural residential land classifications. Fifty percent of the route crosses smaller plots of cultivated land and rural residential land, 11 percent crosses expanses of wetland, 19 percent crosses municipal areas, 15 percent crosses mixed deciduous and coniferous forest and 5 percent crosses disturbed mine lands.

### **3.0 Comparative Environmental Analysis of Alternative Routes**

This section compares the environmental and human impacts along each of the selected route alternatives. The analysis is based upon the same publicly available environmental data used to construct the NPUC Nashuak-Blackberry Pipeline Route Permit Application/Environmental Analysis Supplement; data published or provided by various state and local governmental groups (i.e., DNR, city of Nashuak and Itasca County); information contained in the Environmental Impact Statement (EIS) for the Minnesota Steel Plant and by field observation. The analysis considers human settlement, land use, natural resources, economies such as agriculture, timber and mining, and cost. The results of this comparative analysis are summarized in **Table 1**.

Minnesota Rule 7852.1900, Criteria for Pipeline Route Selection, subp.3, provides the criteria to be used in selecting a route for designation and issuance of a pipeline routing permit. These same criteria were used to compare the route alternatives. They are:

- A. human settlement, existence and density of populated areas, existing and planned future land use, and management plans;
- B. the natural environment, public and designated lands, including but not limited to natural areas, wildlife habitat, water, and recreational lands;
- C. lands of historical, archaeological, and cultural significance;
- D. economies within the route, including agricultural, commercial or industrial, forestry, recreational, and mining operations;
- E. pipeline cost and accessibility;
- F. use of existing rights-of-way and right-of-way sharing or paralleling;
- G. natural resources and features;

- H. the extent to which human or environmental effects are subject to mitigation by regulatory control and by application of the permit conditions contained in part 7852.3400 for pipeline right-of-way preparation, construction, cleanup, and restoration practices;
- I. cumulative potential effects of related or anticipated future pipeline construction; and
- J. the relevant applicable policies, rules, and regulations of other state and federal agencies, and local government land use laws including ordinances adopted under Minnesota Statutes, section 299J.05, relating to the location, design, construction, or operation of the proposed pipeline and associated facilities.

The overall human and environmental impact from this project is not likely to be significant, as long as all appropriate and specified mitigation measures for right-of-way preparation, construction and pipeline operation and maintenance are followed. The following sections provide analyses of the various factors considered in reaching this conclusion.

## **HUMAN SETTLEMENT AND POPULATION DENSITY**

Itasca County has a total land area of 1,856,000 or 2,900 square miles; of this total about 170,700 acres or 267 square miles is water surface. About 1,331,600 acres of the total is forestland; 121,000 acres is farmland. There are many thousands of acres of mine land, especially near the southeast corner of the county where the project is being proposed. The population of the county was 44,384 in 2005. The county is sparsely settled with an overall average population density of 17 persons per square mile. The Highway 169 route from Grand Rapids to Keewatin is the most densely populated part of the county with approximately 14,000 people living in the roughly 50 square miles along the main road. There are approximately 280 people per square mile in this portion of the county. Grand Rapids is the county's largest city and the county seat. Its population was 7,764 in 2004.

House counts of houses within 330 feet of the centerline for each route corridor were evaluated. The house counts ranged from 5 to 156 between the various alternatives. When the house count was expanded to 660 foot from the centerline, the numbers ranged from 33 to 236.

## **NATURAL ENVIRONMENT**

### ***Vegetation***

The existing vegetation, wildlife, fisheries and endangered species, the effect of construction on each of them, and proposed mitigation, are detailed in the Application's Environmental Assessment Supplement.

Information from the Minnesota Department of Natural Resources (DNR) Natural Heritage and Information System (NHIS) database was used to determine if any rare plant or animal species or other significant natural feature might be impacted by the proposed project. Forest land, wetlands, grasslands, and agricultural fields planted predominantly in hay and oats are the dominant vegetation types that will be crossed by the proposed and alternative pipeline routes.

**Table 1** illustrates the degree to which these land types will be potentially impacted by the various route alternatives: length of forested lands crossed range from 6.65 miles to 15.31 miles, length of grasslands

crossed range from 4.08 miles to 9.48 miles; length of agricultural lands crossed range from 1.37 miles to 3.87 miles; and length of wetlands crossed range from 1.18 miles to 5.01 miles.

Agricultural areas and wetlands will quickly re-vegetate to pre-construction conditions following construction. Clearing of the right-of-way in non-agricultural areas will be limited to the minimum amount required to safely install the proposed pipeline. After construction, NPUC will maintain an amount of cleared right-of-way for operations and maintenance purposes.

Construction of the pipeline will result in short term impact to vegetation and will not cause any appreciable change in the type of vegetation cover. Much of the route is in forested use, so vegetation maintenance along the pipeline route will be necessary. There will be tree cutting and vegetation clearing along the estimated 24 - 35 mile pipeline right-of-way.

Impacts to vegetation and wildlife along the route alternatives are expected to be minimal due to the widespread abundance of similar habitat present. Long-term impacts to vegetation associated with construction of the proposed pipeline will primarily include the clearing and maintenance of forest vegetation along the permanent right-of-way. During construction activities, the removal of vegetative cover and exposure of soil will increase the potential for wind and water erosion, and may increase soil temperatures because of additional sunlight exposure.

### ***Wildlife***

Construction of the proposed facilities will likely result in temporary impact on wildlife habitat, as well as minor, temporary impact on wildlife in the immediate vicinity of the construction areas. Vegetation clearing will result in reduced cover, nesting and foraging habitat for some wildlife. Species that are more mobile will be temporarily displaced from the construction areas to similar habitats nearby. The proposed construction may temporarily displace avian, mammal, amphibian and reptile species.

Although some loss of less mobile wildlife such as small mammals, amphibians, and reptiles, may incur within the construction work area, it is likely that the vast majority of wildlife will relocate to suitable adjacent habitats during construction. Most likely, the displaced species will either recolonize in adjacent areas or reestablish their original habitat after construction activities have been completed. Long-term effects to wildlife are anticipated to be limited. The primary long-term effect will be a permanent widening of pipeline corridors. Future periodic maintenance of the right-of-way will comply with any wildlife timing windows as specified by agencies.

Construction and maintenance of the proposed or alternative routes will not significantly alter the character of the landscape along the route(s). Consequently, effects on wildlife will be mostly temporary in nature.

### ***Endangered Resources***

The entire Nashuak pipeline project area has potential for or is within range of three federally-listed species; the bald eagle, gray wolf and Canada lynx.

The DNR NHIS database shows no recorded bald eagle nesting areas within a 0.5-mile radius of any of the pipeline routes. Several occurrences of either endangered, threatened, species of special concern, or listed non-status species were recorded within a one-half mile area of one or more of the various

pipeline route alternatives. A listing of these species can be found in Table E-17 of the Environmental Analysis Supplement within the NPUC's Pipeline Routing Permit Application, dated July 2007. Of these occurrences, 3 were listed for Alternative 1, 5 for Alternative 2, 1 for Alternative 3, 14 for Alternative P-1, 11 for Alternative P-2, and 14 for the CAC alternative route segment.

Impacts to species or their habitats listed as either "species of special concern" or "non-status species" are not regulated by State law.

NPUC will consult, as a condition of the Pipeline Route Permit, with the DNR and USFWS regarding threatened and endangered species and their potential presence within the selected pipeline corridor. If any species are identified as potentially occurring within the planned construction areas, a biological survey will be conducted and mitigation plans developed to avoid or minimize impacts on the affected species.

#### ***Air Quality (Noise, Dust and Vehicle Exhaust)***

During project construction, there will be emissions from vehicles and construction equipment and fugitive dust from right-of-way clearing. Temporary air quality impacts caused by the proposed construction-related emissions are expected to occur. Fugitive dust may result from any right-of-way clearing required. The magnitude of these emissions is influenced heavily by weather conditions and the specific construction activity taking place. Exhaust emissions from diesel equipment will vary during construction, but will be minimal and temporary. Once installed and functioning, the pipeline will not generate any noise under normal operations.

#### ***Water Quality***

Hydrologic features, such as wetlands, lakes, rivers and floodplains perform several important functions within a landscape, including flood attenuation, ground water recharge, water quality protection and wildlife habitat production. Hydrologic resources are regulated by several different agencies in Minnesota, including the USACE, the Minnesota Board of Water and Soil Resources (BWSR), the DNR and the MPCA.

Public Waters are water basins and watercourses of significant recreational or natural resource value in Minnesota as defined in Minnesota Statute 103G.005. The DNR has regulatory jurisdiction over these waters. The total number of watercourse crossings ranged from 4 to 8 among the various route alternatives.

During pipeline construction, Best Management Practices (BMP) will be employed to minimize potential impacts to water bodies. Additionally, these activities will be governed under permits (i.e., NPDES Discharge permit for hydrostatic water and dewatering operations and an NPDES Stormwater Discharge Permit) issued by the Minnesota Pollution Control Agency (MPCA).

#### ***Surface and Groundwater***

Each route alternative crosses a number of linear water bodies in traversing the land between Nashuak and the GLG pipeline. These water bodies included permanent streams, intermittent and perennial streams and existing drainage ditches. NPUC quantified the number of watercourse crossings (rivers, streams, and drainage ditches) for each route alternative as follows:

- Alternative 1 has ten crossings of intermittent or permanent water bodies. Of these crossings, 6 are protected water crossings, 8 are perennial watercourse crossings, and two are intermittent watercourse crossings.
- Alternative 2 has nine crossings of intermittent or permanent water bodies. Of these crossings, 4 are protected water crossings, 8 are perennial watercourse crossings, and one is an intermittent watercourse crossing.
- Alternative 3 has eight crossings of intermittent or permanent water bodies. Of these crossings, 4 are protected watercourses, 7 are perennial watercourse crossings, and one is an intermittent watercourse.
- Alternative P2 has 10 crossings of intermittent or permanent water bodies. Of these crossings, 4 are protected watercourses, 6 are perennial watercourse crossings, and three are intermittent watercourses. This alternative crosses 1 designated trout stream
- Alternative P1 has 17 crossings of intermittent or permanent water bodies. Of these crossings, 8 are protected watercourses, 13 are perennial watercourse crossings, and four are intermittent watercourses. This alternative crosses 2 designated trout streams.
- The CAC Route Segment has 12 crossings of intermittent or permanent water bodies. Of these crossings, 7 are protected watercourses, 11 are perennial watercourse crossings, and one is an intermittent watercourse.

The impact on water crossings can be minimized further by using horizontal directional drilling to cross beneath significant streams and rivers and following the standard erosion control measures identified by the MPCA. Permits will be secured by NPUC from the MDNR once the route has been identified by the Commission. Once the project is complete it will have no significant long-term impact on surface water quality.

### ***Wetlands***

Depending on the final route selected by the Commission, various acreages of wetland habitat may be affected by the proposed temporary and permanent ROWs.

Detailed wetland mapping will be required as part of the final route design/survey process, but initial analysis of the six route alternatives shows that each of the routes crosses a mix of local wetlands mostly of type 2 – wet meadow, type 3 – shallow marsh, type 6 – shrub swamp, type 7 - wooded swamps and type 8 – bogs.

Wet meadows are made up of soil that is usually without standing water during most of the growing season but is waterlogged periodically. Shallow marsh is a type of soil that is usually waterlogged early during the growing season and may often be covered with standing water. Shrub swamp is a soil that is usually waterlogged during the growing season and is often covered with as much as 50 percent shrubby vegetation. Wooded swamps are soil that are waterlogged at least to within a few inches of the surface during the growing season and dominated by trees. Bogs are soils that are usually waterlogged. These occur mostly in ancient lake basins, on flat uplands.

Although no special or protected wetlands are known to occur within the proposed pipeline routes, each alternative crosses some unique mapped wetlands:

- Alternative 1 crosses 33 unique mapped wetlands.

- Alternative 2 crosses 22 unique mapped wetlands.
- Alternative 3 crosses 26 unique mapped wetlands.
- Alternative P2 crosses 17 unique mapped wetlands.
- Alternative P1 crosses 32 unique wetlands.
- CAC Route Segment crosses 22 unique mapped wetlands.

The temporary wetland impacts (such as tree and shrub clearing) resulting from construction activities will be mitigated by restoring the area after pipeline construction is completed. The impact on wetland will be minimized during construction by the use of timber construction mats, timber riprap or low ground pressure equipment to lessen the disturbance to the wetland.

### ***Soil Composition and Impact Mitigation***

A general description of the soil composition, conditions and characteristics is set forth in the Application's Environmental Assessment Supplement. Pipeline construction activities such as clearing, grading, trench excavation, and backfilling, as well as the movement of construction equipment along the right-of-way, may impact the soil. NPUC has agreed to minimize or avoid the impact on soils through the mitigation measures in the Upland Erosion Control, Revegetation, and Maintenance Plan, the Agricultural Impact Mitigation Plan, and the Wetland and Water body Construction and Mitigation Procedures. In addition, NPUC will comply with all federal, state and local permits.

All the proposed pipeline routes cross the mixed glacial soils of Southeastern Itasca County in Northeastern Minnesota. These include nearly level organic soils in upland depressions, nearly level to very steep loamy and silty soils on uplands, nearly level to sloping sandy, loamy and silty soils on uplands and iron mining areas, which could include slickens, mine pits, mine dumps and areas of revegetated mineland reclamation.

The native soils in the area are a complex mixture of mineral soils, mostly Boralfs such as Zimmerman loamy fine sand, Cowhorn loamy very fine sand, Cutaway loamy sand, Sandwick loamy fine sand, Nashuak fine sandy loam, Warba fine sandy loam, Nebish fine sandy loam, Keewatin silt loam, Itasca silt loam, Goodland silt loam on the upland areas. The mineral soils are mainly light-colored, sandy, glacially deposited and formed under forest vegetation. A mix of fibric, hemic and sapric organic soils such as Cathro muck, Greenwood peat, Blackhoof muck and Mooselake mucky peat dominate the lower wet areas. About one quarter of the entire county consists of peats or organic soils.

The project study area contains many clustered mine pits, tailings disposal areas and associated mineland reclamation parcels. Specific soils information for the proposed routes in Itasca County was obtained from the Natural Resource Conservation Service (NRCS).

## **LANDS OF HISTORICAL ARCHAEOLOGICAL AND CULTURAL SIGNIFICANCE**

Section 106 of the National Historic Preservation Act requires consideration of impacts on historic, archaeological and cultural properties determined eligible for listing on the National Register of Historic Places (NRHP). The Area of Potential Effects (APE) for archaeological resources is defined as all areas of potential effects from aspects of direct, physical impacts through the construction of the gas pipeline and other associated facilities. The potential area of impact due to pipeline construction includes not

only the area within the right-of-way but also nearby areas used during project construction. Specifically, the recommended APE for the architectural history resources extends to 0.25 miles from the centerline of proposed pipeline routes along existing or new proposed rights of way, giving a ½ mile wide study area.

The Minnesota Historical Society State Historical Preservation Office (SHPO) was contacted to review the route pursuant to the Minnesota Historic Sites Act and the Minnesota Field Archaeology Act. SHPO file review of the routes is currently underway.

### ***Cultural Resources***

NPUC hired the 106 Group to review Minnesota Historical Society and Minnesota State Historic Preservation Office data to identify previously recorded cultural resources within the proposed construction right-of-way for the preferred site. NPUC has completed preliminary research regarding cultural resources that could potentially be impacted by the proposed project.

The review did not identify any archaeological sites or historic properties within any of the routes under consideration.

Prior to start of the construction (i.e. clearing, grubbing, grading, trenching activities), NPUC will develop a sensitivity model for the selected pipeline route. The model will divide the approved route into sectors of high, moderate and low probabilities of containing previously undocumented resources. The model will be developed using distributions of known sites in the vicinity of the approved pipeline route, along with consideration of the land features that are predictors for potential sites (i.e., presence of water, topography, shelter, etc.).

Once the model and its data have been reviewed and approved by the USACE and SHPO, NPUC will develop and implement field survey protocols to be conducted ahead of and during construction.

## **ECONOMIES WITHIN THE ROUTE**

### ***Commercial, Industrial and Residential Land Use***

Zoning and land use information was obtained for Itasca County and cities along the preferred and alternative routes which includes: Nashuak, Marble, Calumet, Bovey, Coleraine and Taconite. There are 6 communities within one mile of the preferred route. Details of land types along various proposed routes are found in **Tables 1**. The major land types are forested rural residential, wetlands, industrial or mining lands and small agricultural holdings.

### ***Economic Impacts***

Economic benefits to the local economy will be realized during construction because of the project labor workforce. These benefits will include expenditures for materials, workforce lodging, fuel sales, grocery sales and restaurant expenditures. Additional local benefits will include easement payments, permit fees and property tax revenues. The availability of reliable gas supplies in the area would have a positive effect on local businesses and the quality of service provided to the general public.

The local economy will benefit from construction of the pipeline. Pipeline construction will require highly skilled, highly paid construction workers including heavy equipment operators, electricians, iron

workers and other trades who will add significant payroll into the regional economy. The state and counties will also benefit from income and sales taxes paid because of the construction of the project.

Impacts to existing roads within the project area will be short-term and minimal. No new roads will be constructed for the pipeline. Necessary road crossing permits will be obtained from state or local authorities. The pipeline will be installed almost entirely in forested rural residential land that will continue to be used for the same purpose after the project was completed.

### ***Agriculture and Prime Farmland***

Preliminary information indicates that the proposed pipeline may encounter agricultural lands in portions of the proposed corridor. In those areas where there is potential to cross agricultural lands, pipelines will be placed on section lines and field breaks, where possible, to minimize interference with agricultural operations. The length of agricultural lands crossed range from 1.37 miles to 3.87 miles between the various route alternatives.

Where pipeline excavation and installation is conducted on cropland, some mixing of the topsoil and subsoil as well as loss of cropland is inevitable. Farmers may experience a slight decline in productivity in their acreage along the pipeline ROW. Although very little active farmland will be disrupted by construction of the proposed pipeline route, any areas of prime farmland that are or have been used for cropland in the last three years and are impacted by pipeline ROW will be compensated.

The final permit will have an Agricultural Impact Mitigation Plan (AIMP) that provides the specifics of how this will be implemented. As part of the Environmental Assessment Supplement to the Pipeline Routing Permit Application, NPUC developed an Agricultural Impact Mitigation Plan (AIMP). NPUC will continue to consult with MDA during the Routing Permit process and will incorporate the final AIMP into specifications for construction on agricultural land.

The AIMP addresses several of the concerns raised during the public hearings including pipeline depth, separation and replacement of topsoil, soil compaction, soil restoration, conservation reserve land, ingress and egress to the right-of-way, weed control, and advance notice of access to property. The AIMP states that NPUC will develop and put into place a procedure for the processing of anticipated landowners' or tenants' claims for construction-related damages to standardize and minimize landowner and tenant concerns about recovery of damages.

### ***Transportation***

The pipeline will parallel existing pipelines, transmission lines or road ROW for as much of the line's distance as possible. However, the pipeline will not affect transportation systems except for minor impacts during the construction period.

### ***Mining & Forestry***

The project area is a mix of forested land, wetlands, pasture and small farms, and mine lands. Iron ore deposits (i.e., the Mesabi Range), along with past and present mining activities (i.e., mine pits, tailings basins, stockpiles, reclaim ponds, etc.) follow a belt of iron ore 110 miles long, averaging 1 to 3 miles wide, and reaching a thickness as great as 500 feet. The "range" extends between Grand Rapids and Babbit, Minnesota.

A regional feature to keep in mind when evaluating potential pipeline routes originating from the GLG pipeline is the Mesabi Range, including past, current and potential future activities associated with the ore deposits.

Pipeline routes which tap into the GLG pipeline east of Grand Rapids, and therefore south of the range, must at some point cross the range to connect to the Minnesota Steel plant, which is located on the north side of the range. Due to past, present and future mining activities, the number of available areas, within a reasonable distance from both the GLG pipeline and the Minnesota Steel Plant, to cross the range are limited.

When reviewing the Itasca County's Land Use/Land Cover data, three potential areas to cross the ore deposits become apparent: the Highway 7 area near the city of Taconite; the area between Patrick Stilling Basin and Snowball Lake near Pengilly; and through the city of Nashwauk (i.e., the isthmus of land between Hawkins Pit and LaRue Pit). Add to this data the future mining activities associated with the Minnesota Steel plant and the passage near Pengilly is eliminated from consideration.

The Nashwauk isthmus presents some severe technical issues relating to the development of a linear project such as the natural gas pipeline route through the city of Nashwauk. When considering potential future mining activities around the two pits, the blast buffer zone (2000 feet), and the population density, routing through the city becomes problematic.

The length in which the various pipeline route alternatives cross the iron ore formation ranges from 0.91 miles to 2.80 miles.

In some areas the pipeline ROW may take a small portion of land, equivalent to the width of the permanent easement, out of timber production. The length in which the various pipeline route alternatives cross state managed timber land ranges from 0.57 miles to 2.31 miles.

### ***Economic Development***

Continuing economic growth from Minnesota Steel's expansion in the Nashwauk area will cause an increase in natural gas use in the region. The addition of a major new facility and the increase in demand will create natural gas delivery concerns in this area. The existing pipeline system is unable to provide the quantities required by Minnesota Steel. The proposed pipeline project will encourage economic development along the corridor, enhance overall system reliability and provide greater flexibility in terms of natural gas availability.

### **PIPELINE COST AND ACCESSIBILITY**

The proposed pipeline project is estimated to cost approximately \$24-\$35 million, depending on the final route chosen and a number of uncertain factors inherent in obtaining information and right-of-way easements. Improving the accessibility to natural gas supplies in the Taconite-Nashwauk area will have a long-term positive economic impact in this portion of Itasca County.

## **USE OF EXISTING RIGHT-OF-WAY (ROW)**

The preferred routes for this pipeline will parallel existing electric transmission line ROW, existing gas pipelines and state and county road ROW to the maximum extent possible.

Whichever route is selected by the Commission, NPUC will strive to avoid individual residences, buildings and sensitive areas such as wetlands and other areas that will impact the environment or present difficult construction problems. All opportunities to share or parallel any existing ROW that will not increase the environmental or economic impact of the project will be evaluated.

The pipeline routes are from approximately 24 to 35 miles in length, with a permanent right-of-way width of 70 feet; along portions of the pipeline route an additional 30 feet of temporary ROW may be required for construction support activities. This project could require between 150 acres and 420 acres of ROW land depending on which route is selected by the Commission.

The length in which the various pipeline route alternatives utilize existing corridors (i.e., pipeline, transmission line, roads and rail ROWs) ranges from 6.89 miles to 31.78 miles.

## **IMPACT MITIGATION BY REGULATORY AND PERMIT CONIDITION**

Potential negative human, environmental and public health impacts that could result from the proposed pipeline project are mitigated by several factors. Several levels of regulatory controls are placed on the project by the need to apply for and obtain Federal, State, County and Local permits and the requirement to follow permit conditions for separate actions or portions of the project. These include an overall project permit, requiring review by several independent agencies charged with responsibility for management of environmental resources, discharge limitations, restrictions on land use modification, material specifications and construction standards. Additional protection is provided by on-site material and installation inspection, third party agricultural and environmental inspectors, city, county and consultant staff and agency personnel.

The U.S. Office of Pipeline Safety (OPS) has developed a number of safety programs. These measures will be employed to minimize the risk to public health and safety from pipeline installation and operation. The OPS Integrity Management Program requires pipeline operators to comprehensively assess, identify, and address, where necessary, the safety of pipeline segments that are located in areas where the consequences of a pipeline failure could be significant.

Many objections at the public meetings centered on the potential risk presented by a natural gas pipeline. The concerns were heightened by a recent gas pipeline failure in Illinois which is still under investigation by the NTSB. Landowners were concerned about the damage that such an incident could cause on their property, including the health risks to their family, property damage, and the environmental effects. The Minnesota Office of Pipeline Safety oversees the construction and operation of all pipelines in Minnesota with the goal of minimizing any safety risk associated with the pipeline. There will be minimal impacts to human settlement from the proposed pipeline. NPUC will consult with and work with affected landowners during permitting, final design, and easement negotiation to avoid and minimize any temporary or permanent impacts to residences, farms, or other business.

Construction along the pipeline route will cause temporary disturbance to forestry and recreational areas, but is not expected to have long term impacts in the area. No significant long term impacts to vegetation and wildlife; geology and soils; and water resources and wetlands are expected. Best management practices (BMPs) and erosion control measures will be implemented during construction to protect adjacent wetlands and to preserve soil biota in excavated areas. Seeding with native plant species appropriate to the hydrologic regime is planned for final restoration.

## **CUMULATIVE POTENTIAL EFFECTS**

A new industrial facility of the magnitude of Minnesota Steel would be expected to have a cumulative impact in the project area. The associated pipeline needed to facilitate this steel plant is an essential component of the facility and is likely to bolster other industrial and commercial development in the general area.

Construction of the pipeline route will not have any direct impact on the cultural, historic or aesthetic values of the area. The area presently has roads, HVTLs, pipelines, railroads and utility towers. Installation of the pipeline will not change land use patterns. No significant change in the vegetation, wildlife, soils, geology, and wetland or water quality is expected to occur because of this proposed project.

Landowners will be consulted to identify concerns related to the pipeline placement and aesthetics. In general, mitigation includes enhancing positive effects as well as minimizing or eliminating negative effects. Location of structures, ROW, and other disturbed areas will be determined by considering input from landowners or land management agencies to minimize impacts.

Care will be used to preserve the natural landscape; construction and operation shall be conducted to prevent any unnecessary destruction, scarring, or defacing of the natural surroundings in the vicinity of the work. To the extent practicable, the new pipeline will parallel existing pipelines, roads, transmission lines and other ROWs to the extent that such actions do not violate sound engineering principles or system reliability criteria.

The need to keep rights-of-way cleared to allow for inspection and maintenance of the pipelines must be balanced against the need to allow a degree of ecological function and vegetation growth. The extent of change to the environment largely depends on the type of vegetative cover that is traversed by the pipeline ROW. Small changes occur in agricultural fields, and the greatest changes occur when forested areas are cleared to accommodate construction and to maintain the right-of-way.

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**TABLE**

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**Table 1 Route Comparison  
NPUC Blackberry to Nashwauk Pipeline Proposal**

	Pipeline Routes						
	UNITS	ICMSI-1 WestGR (alternative 1)	ICMSI-2 EastGR (alternative 2)	NPUC Prop. Route (alternative 3)	Citizen's Route-1 Aband. RR (alternative P-1)	Citizen's Route-2 Hwy 65 (alternative P-2)	CAC Route-1 NNG Line (alternative C-1)
Route Map Color (line type)	na	YELLOW (solid)	ORANGE (solid)	RED (solid)	LIGHT BLUE (dashed)	DARK BLUE (dashed)	PURPLE (dashed-dot)
<b>Total Length</b>	Feet	136,972	129,830	125,044	187,147	157,973	143,118
<b>Total Length</b>	Miles	<b>25.94</b>	<b>24.59</b>	<b>23.68</b>	<b>35.44</b>	<b>29.92</b>	<b>27.12</b>
<b>Human Settlement</b>							
House Count w/in 330' of center line	Number	31	10	5	79	156	56
House Count w/in 660' of center line	Number	33	44	36	149	236	134
Mean (Average) House Distance within 330' of center line	Feet	212	265	279	218	201	226
<b>Route Centerline (Public vs. Private) Parcel Ownership</b>							
Physical parcel count total	Number	<b>168</b>	<b>148</b>	<b>144</b>	<b>203</b>	<b>200</b>	<b>183</b>
Parcel count private	Number	130	131	133	155	137	145
Length of route centerline thru privately owned parcels	Feet	<b>110,758</b>	<b>115,628</b>	<b>116,142</b>	<b>122,201</b>	<b>92,951</b>	<b>110,119</b>
Parcel count public	Number	26	17	11	48	63	38
Length of route centerline thru publicly owned parcels	Feet	<b>24,718</b>	<b>14,202</b>	<b>8,901</b>	<b>51,007</b>	<b>65,022</b>	<b>32,999</b>
Total Route Length	Feet	135,476	129,830	125,044	173,207	157,973	143,118
<b>Existing Land Use</b>							
Farm-Residential or Rural-Residential areas crossed	Feet	<b>74,009</b>	67,043	69,692	63,912	72,856	72,166
Municipal areas crossed	Feet	<b>26,673</b>	25,571	23,367	24,435	24,435	26,639
Active Railroads crossed	Number	1	2	2	2	2	2
Roads crossed	Number	17	15	16	28	32	26
<b>Natural Environment</b>							
Watercourse crossings total (watercourse includes rivers, streams, or drainage ditches)	Number	10	9	8	17	10	12
(Protected-PWI) watercourse crossings	Number	6	4	4	8	4	7
(Perennial) watercourse crossings	Number	8	8	7	13	6	11
(Intermittent) watercourse crossings	Number	2	1	1	4	3	1
Length of route centerline thru NWI-mapped wetlands (ft)	Feet	26,449	17,771	17,589	23,628	6,254	15,701
Length of route centerline thru NWI-mapped wetlands (mi)	Miles	<b>5.01</b>	<b>3.37</b>	<b>3.33</b>	<b>4.47</b>	<b>1.18</b>	<b>2.97</b>
Seasonally flooded basin or flat / NWI-CIRC 39	Feet	0	0	333	0	0	0
Wet meadow / NWI-CIRC 39	Feet	2,803	85	972	5,465	965	0
Shallow marsh / NWI-CIRC 39	Feet	599	99	0	955	0	347
Deep marsh / NWI-CIRC 39	Feet	109	0	0	573	0	0
Shallow open water / NWI-CIRC 39	Feet	0	0	0	0	229	0
Shrub swamp / NWI-CIRC 39	Feet	9,680	11,601	7,034	8,735	3,026	7,209
Wooded swamp / NWI-CIRC 39	Feet	8,024	4,509	7,585	6,810	1,423	2,163
Bogs / NWI-CIRC 39	Feet	4,913	1,188	1,666	1,091	612	0
Municipal and industrial activities / NWI-CIRC 39	Feet	0	0	0	0	0	0
Riverine systems / NWI-CIRC 39	Feet	320	289	0	0	0	289
NWI-mapped wetland complexes crossed (wetland complexes are contiguous wetlands)	Number	33	22	26	32	17	22
NWI-mapped wetland complex elements or fingers crossed	Number	47	31	32	44	21	30
Length of route thru forested landcover (ft)	Feet	35,101	63,757	79,946	80,836	75,670	64,033
Length of route thru forested landcover (mi)	Miles	<b>6.65</b>	<b>12.08</b>	<b>15.14</b>	<b>15.31</b>	<b>14.33</b>	<b>12.13</b>
Coniferous forest	Feet	2,042	4,338	5,869	2,407	3,725	2,746
Deciduous forest	Feet	13,821	19,221	25,684	42,045	42,043	31,477
Mixedwood forest	Feet	8,547	16,423	23,236	24,113	19,685	13,212
Regeneration/young forest	Feet	10,691	23,775	25,157	12,271	10,217	16,598
Length of route thru grassland landcover (ft)	Feet	21,568	27,463	15,469	50,077	32,316	44,451
Length of route thru grassland landcover (mi)	Miles	<b>4.08</b>	<b>5.20</b>	<b>2.93</b>	<b>9.48</b>	<b>6.12</b>	<b>8.42</b>

**Table 1 Route Comparison  
NPUC Blackberry to Nashwauk Pipeline Proposal**

	Pipeline Routes						
	UNITS	ICMSI-1 WestGR (alternative 1)	ICMSI-2 EastGR (alternative 2)	NPUC Prop. Route (alternative 3)	Citizen's Route-1 Aband. RR (alternative P-1)	Citizen's Route-2 Hwy 65 (alternative P-2)	CAC Route-1 NNG Line (alternative C-1)
Route Map Color (line type)	na	YELLOW (solid)	ORANGE (solid)	RED (solid)	LIGHT BLUE (dashed)	DARK BLUE (dashed)	PURPLE (dashed-dot)
Total Length	Feet	136,972	129,830	125,044	187,147	157,973	143,118
Total Length	Miles	25.94	24.59	23.68	35.44	29.92	27.12
<b>Lands of Historic/Archaeological/Cultural Significance</b>							
NRHP-listed Sites within 0.25 miles of route	Number	0	0	0	0	0	0
Tribal Lands crossed	Number	0	0	0	0	0	0
<b>Economies (Forestry, Mining, Agricultural, Commercial/Industrial, Recreational)</b>							
State managed timber land crossed	Feet	12,032	6,668	5,329	5,129	5,129	2,983
Disturbed mine lands crossed	Feet	2,879	2,879	2,879	6,513	6,513	6,513
Iron formation crossed	Feet	4,744	10,491	10,491	14,542	14,542	14,542
Agricultural (Tax Class Parcels) crossed	Feet	7,140	10,560	10,106	18,743	13,557	20,125
Prime farmland soils crossed	Feet	44,639	68,161	70,710	65,102	47,828	58,482
Farmland soils of statewide importance crossed	Feet	18,194	7,437	2,106	12,917	14,577	7,437
Center pivot irrigation systems crossed	Feet	na	na	na	na	na	na
Commercial/Industrial land crossed	Feet	17,169	26,190	26,602	60,448	28,730	28,535
Public land crossed	Feet	18,881	10,766	5,382	22,583	28,415	15,518
Recreational/Commercial land crossed	Feet	0	0	0	1,813	3,384	0
<b>Cost</b>							
Estimated	\$	27,173,000	25,668,000	24,153,000	34,591,000	29,158,000	29,000,000
Estimated	\$Millions	27.17	25.67	24.15	34.59	29.16	29.00
<b>Pre-existing Corridor ROW (sharing/paralleling)</b>							
Existing Gas ROW sharing/paralleling	Feet	0	41,284	1,959	17,338	17,338	105,729
Existing HVTL ROW sharing/paralleling	Feet	106,064	51,773	21,704	1,306	1,306	33,547
Existing Roads ROW sharing/paralleling	Feet	24,205	18,572	12,141	99,556	131,931	37,541
Abandoned Rail ROW sharing/paralleling	Feet	0	0	0	132,421	38,147	0
Active Rail ROW sharing/paralleling	Feet	0	0	0	3,479	3,479	3,479
Length of Route that shares/parallels any type of Corridor ROW listed above	Feet	118,205	75,129	35,804	165,263	136,089	121,253
% of total	%	86%	58%	29%	88%	86%	85%
Greenfield corridor length	Feet	18,587	54,701	89,240	21,884	21,884	21,865
% of total	%	14%	42%	71%	12%	14%	15%
<b>Natural Resources/Features</b>							
Federal/State-listed species within 0.5 miles of route	Number	3	5	1	14	11	14
Designated trout streams crossed	Number	0	0	0	2	1	0
Designated (County/State/Federal) recreation lands crossed	Feet	na	na	na	na	na	na
State Wildlife Management Areas (WMA) crossed	Feet	0	0	0	0	0	0
State Forest land crossed	Feet	0	0	0	0	0	0
Potentially Fatal Flaw							

**FIGURE**

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