

3.0 HUDSON RIVER ALTERNATIVES

The NMFS stated that the Haverstraw Bay within the Hudson River is known to provide habitat for the shortnose sturgeon, a federally endangered species, and the Atlantic sturgeon, a Federal candidate species. Haverstraw Bay is also a designated Significant Coastal Fish and Wildlife Habitat that is part of the state's CZM Program (NYSDEC, 1999), and has been designated as EFH for seven fish species. The NMFS believes that construction across the Hudson River at Millennium's proposed crossing location could result in a direct impact on the shortnose sturgeon. The NYSDOS has indicated that the proposed crossing may not be consistent with the state's coastal zone management program. In addition, there are concerns about impact on other fisheries from the turbidity associated with dredging, the effects of downstream sedimentation, and the potential to resuspend contaminated sediments since this stretch of the Hudson River was placed on the Superfund's National Priority Site list in 1984 (see section 2.2.4). Because of the likelihood of adverse impact on the sensitive habitats of Haverstraw Bay, several routing alternatives were considered.

We evaluated two alternative crossings of the Hudson River, one about 3.3 miles north of the proposed crossing in Haverstraw Bay at the Algonquin Gas Transmission Company (Algonquin) pipeline crossing and one about 11.3 miles south of the proposed crossing at the Tappan Zee Bridge (see figure 3-1). The NMFS indicated that, because these alternatives would be outside of Haverstraw Bay, they would greatly reduce potential impact on the shortnose sturgeon (NMFS, 1999). They would also avoid the most productive areas of the recently-designated EFH in Haverstraw Bay for seven species (red hake, Winter flounder, windowpane, bluefish, Atlantic butterfish, fluke, and Atlantic herring). Further, the NYSDOS indicated that an alternative crossing location outside the state-designated Significant Coastal Fish and Wildlife Habitat of Haverstraw Bay would more likely be consistent with the New York coastal zone management plan.

In addition to potential Hudson River route alternatives, we evaluated a system alternative using a combination of the Algonquin and Iroquois Gas Transmission System (Iroquois) pipeline systems (see section 3.3).

3.1 HUDSON RIVER NORTH CROSSING/ALGONQUIN ALTERNATIVES (MPs 377.9 to 391.7)

We identified two potential routes to the north alternate Hudson River crossing between approximate MP 377.9 in Ramapo, Rockland County and MP 391.7 in Cortlandt, Westchester County (see figure 3-1). Table 3.1-1 compares Hudson River Alternatives 1 and 2 with the corresponding segment of the proposed route.

3.1.1 Hudson River North Alternative 1

Alternative 1 would deviate from the proposed route near the Ramapo Station at MP 377.9 and would turn northeast adjacent to the Algonquin pipeline and ConEd powerline rights-of-way. The alternative would continue adjacent to these rights-of-way for about 10.0 miles to the Hudson River, which is about 5,400 feet wide (1.0 mile) at the alternate crossing. Alternative 1 would cross the Hudson River adjacent to the Algonquin pipelines and would continue east adjacent to the pipeline right-of-way for about 0.9 mile to the ConEd right-of-way. Alternative 1 would then turn southeast adjacent to the ConEd powerline and continue for about 1.4 miles to rejoin the proposed route at MP 391.7. Alternative 1 would be adjacent to existing rights-of-way for all but about 700 feet.

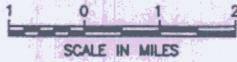
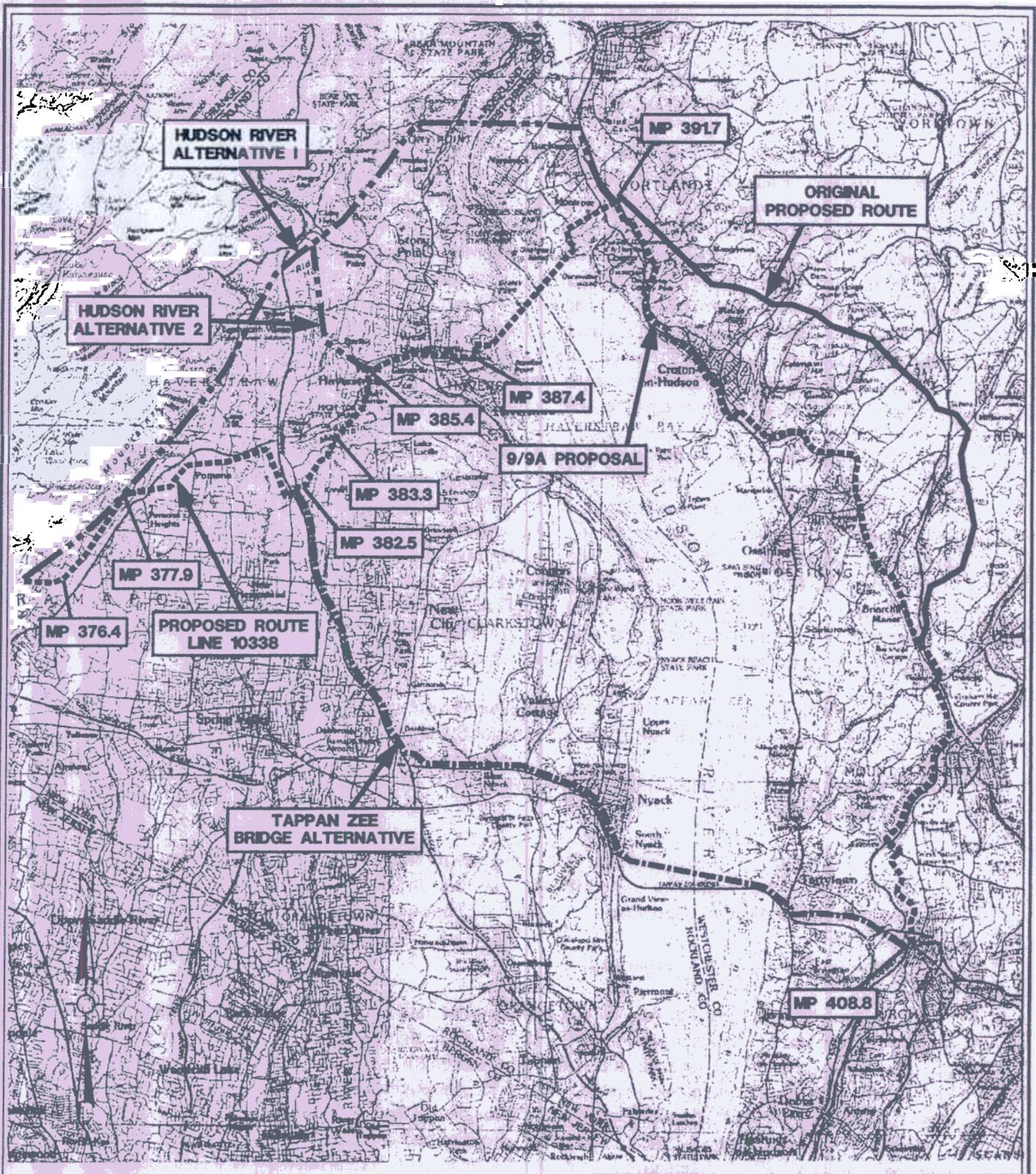


FIGURE 3-1

HUDSON RIVER ALTERNATIVES

SCALE: AS SHOWN

| County | Mileposts/ Environmental Factor | Unit | Proposed Route | Alternative 1 | Alternative 2 |
|-----------------------------|--|------|-------------------|---------------|---------------|
| Rockland and Westchester | MPs 377.9 to 391.7 | | | | |
| | • Total length | mi | 8.4 | 17.4 | 17.2 |
| | Length without lateral | mi | 8.4 | 13.3 | 13.1 |
| | Lateral to Bowline | mi | 0.0 | 4.1 | 4.1 |
| | • Land requirements ^{a/} | | | | |
| | Construction right-of-way | ac | 76.4 | 120.9 | 119.1 |
| | Permanent right-of-way | ac | 50.9 | 80.6 | 79.4 |
| | • Length adjacent to existing right-of-way (excluding the lateral to Bowline) | mi | 4.1 | 13.2 | 10.1 |
| | • NRHP listed or eligible properties crossed | | | | |
| | Harriman State Park | ft | 0 | 19,536 | 0 |
| | Palisades Interstate Park | ft | 0 | 500 | 1,800 |
| | • Residential subdivisions crossed | | | | |
| | Call Hollow Road | no. | 0 | 1 | 0 |
| | Willow Grove Road | no. | 0 | 1 | 1 |
| | Palisades/Cedar Pond Road | no. | 0 | 1 | 1 |
| | Bulsontown/Frank Roads | no. | 0 | 1 | 1 |
| | Buckberg/Mott Farm Roads | no. | 0 | 1 | 1 |
| | U. S. Route 202 | no. | 0 | 0 | 1 |
| | Buena Vista/South Mountain Roads | no. | 1 | 0 | 0 |
| | U. S. 202/Bridge Road | no. | 1 | 0 | 0 |
| | • Hudson River crossing width | mi | 2.1 | 1.0 | 1.0 |

^{a/} Acreage calculations do not include the lateral to the Bowline Generating Station or extra work space requirements. Calculations are based on a 75-foot-wide construction right-of-way and a 50-foot-wide permanent right-of-way.

In the first approximate 7.0 miles, Alternative 1 would cross the Harriman State Park (a 3.7-mile-long crossing) and the Palisades Interstate Parkway (which are both listed on the NRHP), and a municipal park that was once part of the Letchworth Village State Mental Hospital grounds between Call Hollow and Willow Grove Roads. Between MP 377.9 and Willow Grove Road, the alternative would be in the Mahwah River valley, where the existing rights-of-way are built along the side slopes that lead into the valley and residences are built up to the right-of-way. Residential subdivisions would be crossed in the vicinity of Call Hollow and Willow Grove Roads in this segment. Millennium believes that a reroute would be required around the residential subdivision near Willow Grove Road.

North of the Palisades Interstate Parkway, the alternative would cross residential subdivisions between the Parkway and Cedar Pond Road, and at Bulsontown and Frank Roads. North of Frank Road, the alternative would cross a Boy Scout of America camp and other camps, as well as another residential subdivision in the vicinity of Buckberg and Mott Farm Roads. Millennium states that reroutes would be required around the residential subdivisions near Cedar Pond Road, Bulsontown/Frank Roads, and Buckberg/Mott Farm Roads. This would require constructing new right-of-way.

Between North Liberty Road/U.S. 9W and the west bank of the Hudson River, the alternative would be in an area that is extremely congested and also characterized by steep slope. In addition to the Algonquin pipelines there are powerlines. Parallel to the Hudson River, there are a two-lane road, an active railroad, and possibly a water line. Because there is also a residence in this area, Millennium states that there would not be enough work space to stage either a conventional or a directionally drilled crossing. In addition, because of the length of the

crossing (1.0 mile), a directional drill at this location would probably be infeasible since setback from the river for staging and to allow for the required pipe curvature and drilling depth would make the length of a directional drill beyond technical capabilities. The limit for a directional drill is about 1 mile under ideal conditions.

On the east bank of the Hudson River, Alternative 1 would be between the Indian Point Generating Station and the LaFarge Gypsum Plant. This area also has limited work space because of the steep, rock faced shoreline, Algonquin's aboveground facilities (mainline valves and launcher/receivers), a natural drainage and associated wetlands, and ship moorings along a second drainage. Beyond the east shore, the alternative would include crossing State Route 9A (with a bridge crossing), a railroad, and commercial and residential development areas.

Millennium also states that if the pipeline is not constructed at the proposed Hudson River crossing then a lateral would eventually need to be constructed to the Bowline Generating Station, since the station plans to use natural gas in the future. The lateral would include Line 10338, which would be acquired by Millennium between the Ramapo and Buena Vista Stations, but would still require the construction of about 4.1 miles of pipeline between MPs 383.3 and 387.4.

Alternative 1 would be 4.9 miles longer than the corresponding segment of the proposed route (not including the 4.1-mile-long lateral to Bowline) and would affect at least 58 percent more land, but possibly more because of extra work space requirements for side slope construction in the Mahwah River valley (see table 3.1-1). Alternative 1 would cross through three more subdivisions than the corresponding segment of the proposed route. It would also cross two NRHP-listed properties (Palisades Interstate Parkway and Harriman State Park) that would not be affected by the corresponding segment of the proposed route. Although Alternative 1 could be adjacent to existing rights-of-way for 99 percent of its length (compared to 49 percent for the proposed route), deviations away from the existing rights-of-way would be required around four residential subdivisions. In addition, construction at the alternate Hudson River crossing location is likely to be infeasible because of existing utility and industrial development on both banks. The most significant advantage of Alternative 1 is that it would avoid the proposed crossing through Haverstraw Bay. Millennium stated that construction of this alternative would cost about \$6 million more than the proposed route.

We do not believe that Alternative 1 could be constructed unless significant segments of the pipeline are placed within Harriman State Park to avoid residential properties along Call Hollow, Gate Hill, and Cedar Flats Roads in Stony Point. We also do not believe that open cut crossing of the Hudson River could be done at the alternate location because of the existing utility (pipeline and powerline) and industrial development that confine both banks of the river. Because this alternative is not likely to be feasible from a construction standpoint and would result in at least an equal environmental impact, we do not recommend further analysis of this route.

3.1.2 Hudson River North Alternative 2

To allow direct comparison of the Hudson River Alternatives, the beginning of Alternative 2 was placed at the beginning of Alternative 1 at MP 377.9. However, no construction would be required between MPs 377.9 and 383.3 because Millennium proposes to acquire the 24-inch-diameter Line 10338 from Columbia and would use it for this segment of the mainline. Construction on Alternative 2 would therefore begin at MP 383.3 and would include construction along the proposed route to about MP 385.4 (2.1 miles). At that point, Alternative 2 would deviate onto a powerline right-of-way that turns west from the proposed route. Alternative 2 would be adjacent to the powerline for about 1.1 miles and then would turn north onto new right-of-way for about 3.0 miles until it joins Alternative 1, about 0.7 mile northeast of the Palisades Interstate Parkway. From that point on, Alternative 2 would follow the same route as Alternative 1 (see figure 3-1).

After leaving the proposed route at MP 385.4, Alternative 2 would cross 0.3 mile of the Palisades Interstate Park adjacent to the powerline right-of-way. This property is listed on the NRHP. After crossing U.S.

Route 202, the alternative would leave the powerline right-of-way and continue on new right-of-way through a residential subdivision near Hammond Road, a park that was once part of the Letchworth Village State Mental Hospital, the Letchworth Village Development Center, a huge residential development off Willow Grove Road, a municipal park, and another residential development off of Cedar Pond Road. Elements of the Letchworth Village are considered potentially eligible for listing on the NRHP. Alternative 2 would join Alternative 1 south of Cedar Pond Road.

Alternative 2 would be 4.7 miles longer than the proposed route and 0.2 mile shorter than Alternative 1. The major disadvantage with Alternative 2 is that no open corridor could be identified through the residential subdivisions that occur between U.S. Route 202 and the intersection with Alternative 1. Alternative 2 would require significant in-street construction through subdivisions, some of which are under construction. Because of the congested nature of the area, Millennium did not believe this route could be reasonably constructed and did not identify a cost for this alternative.

Alternative 2 would require significant amounts of in-street construction through existing and developing residential subdivisions. It would also have the same problems with staging the crossing of the Hudson River and it would also have the same land use impacts as Alternative 1 from a point about 0.7 miles northeast of the Palisades Interstate Parkway across the Hudson River to the interconnection with the proposed route near MP 391.7, since both would follow the same path. Because of these issues, we do not recommend further analysis of its feasibility or its use.

3.2 HUDSON RIVER SOUTH CROSSING - TAPPAN ZEE BRIDGE ALTERNATIVE (MP 382.5 to 408.8)

For this alternative, we considered potential routes from approximate MP 378.0 in Ramapo (Rockland County) to MP 410.0 in Greenburgh (Westchester County) (see figure 3-1). In general, this area is extensively developed for both residential and commercial use, interspersed with areas of industrial use. On the west side of the Hudson River, there are existing north-south trending powerline corridors, but residential development has encroached on these rights-of-way to the point where it would be difficult to install a pipeline within these rights-of-way in numerous locations. An active railroad parallels the west bank of the Hudson River, but passes through numerous residential subdivisions in Haverstraw and Clarkstown and includes a tunnel segment in the Hook Mountain area. The most prevalent land use between Ramapo and the Tappan Zee Bridge is residential. On the east side of the Hudson River, urban development is extensive with no west-east utility corridors. There is open space associated with the Tarrytown Reservoir and we considered existing roads along the Tarrytown Reservoir.

Based on a helicopter flyover and ground reconnaissance of the area, we identified a potential alternative route between MP 382.5 in Ramapo and MP 408.8 in Greenburgh (see figure 3-1). This entire alternative route would be adjacent to existing roads and highways. From MP 382.5, the alternative would turn south adjacent to the east side (north bound lane) of the Palisades Interstate Parkway and would continue on the parkway for 5.7 miles to Interstate (I)-287. At that point, the alternative would turn east adjacent to the west bound lane of I-287 and would continue east for about 3.7 miles to the vicinity of the I-287 and State Route 9W interchange. From there it would continue east for about 0.8 mile within DePew Street in South Nyack to the Memorial Park on the west bank of the Hudson River. This park would be one of the staging areas for an approximate 2.7-mile-long open-cut crossing of the Hudson River.

On the east bank of the Hudson River, the pipeline would be staged from Lucee Park (a ball park south of the Irving Boat Club). Although we looked at a landing about 0.8 mile further north within the old General Motors plant, this area is covered in concrete blocks making it difficult to stage an open-cut crossing on the site. Furthermore, routes from the old General Motors landing site would require construction within the busy streets of Tarrytown as well as along the Tarrytown Reservoir. Although there is an existing pipeline on the south side

of the reservoir, we believe the more southern route (from Lucee Park) would be shorter and would minimize routing through the congested streets of Tarrytown.

From Lucee Park, the alternative would continue east across the railroad tracks and turn south along the railroad before turning southeast to cross State Route 9, and intersect State Route 119/White Plains Road. This segment is about 0.7 mile in length and contains steep slopes along the bank of the Hudson River. At State Route 119/White Plains Road, the alternative would turn east and continue along the southern edge of the road to the proposed route at MP 408.8. This segment is about 2.5 miles in length and would require crossings of both the Old and New Croton Aqueducts (a National Historic Landmark and potential NRHP-listed property, respectively).

The Tappan Zee Bridge Alternative would be about 16.1 miles in total length, or about 9.4 miles shorter than the proposed route between MPs 382.5 and 408.8 (see table 3.2-1). However, this does not include construction to the Bowline Plant at MP 387.4 (4.1 miles) or to the IBM facility in Westchester County at MP 397.8 (11.0 miles). The route to the IBM facility would probably extend northward from MP 408.8 and affect some of the proposed route. If the alternative were used and laterals to these two delivery points were required, the Tappan Zee Bridge Alternative would be about 1.4 miles longer than the proposed route.

TABLE 3.2-1
Comparison of the Hudson River South Alternative
with the Corresponding Segment of the Proposed Route

| County | Mileposts/ Environmental Factor | Unit | Proposed Route | Tappan Zee Bridge Alternative |
|-----------------------------|---|------|-------------------|----------------------------------|
| Rockland and Westchester | MPs 382.5 to 408.8 | | | |
| | • Total length | mi | 25.5 | 16.1 |
| | Lateral to Bowline | mi | 0.0 | 4.1 |
| | Lateral to IBM | mi | 4.3 | 11.0 |
| | • Length adjacent to highways (excluding the lateral to Bowline) | mi | 0.0 | 11.9 |
| | • Length within highways | mi | 8.8 | 0.8 |
| | • NRHP listed or eligible properties crossed | | | |
| | Palisades Interstate Parkway | mi | 5.7 | 0.0 |
| | Old Croton Aqueduct crossing | no. | 1 | 1 |
| | New Croton Aqueduct crossing | no. | 1 | 1 |
| | • Land requirements ^{a/} | | | |
| | Construction right-of-way | ac | 269.9 | 283.6 |
| | Permanent right-of-way | ac | 180.6 | 189.1 |
| | • Parks Crossed | | | |
| | South Nyack Memorial Park | no. | 0 | 1 |
| | Lucee Park | no. | 0 | 1 |
| | Senasqua Town Park | no. | 1 | 0 |
| | • Hudson River crossing width | mi. | 2.1 | 2.7 |

^{a/} Acreage calculations do not include the laterals. Calculations are based on a 75-foot-wide construction right-of-way and a 50-foot-wide permanent right-of-way.

If an open-cut crossing of the Hudson River could be staged between the Memorial Park in South Nyack and Lucee Park in Tarrytown, this alternative may be feasible from a construction standpoint. Because the Hudson River crossing is about 0.6 mile longer than the proposed crossing, construction would likely take longer and could remove these parks from recreational use for up to 6 months or longer if complete revegetation is taken into account. The alternative would also require construction within the Palisades Interstate Parkway (a NRHP-listed property) for about 5.7 miles and this may not be acceptable to the Palisades Interstate Park Commission.

We believe that the Tappan Zee Bridge Alternative would be extremely difficult to construct and would result in significant impact on the Palisades Parkway, I-287, the parks in Nyack and Tarrytown, and dense residential and commercial development in both Rockland and Westchester Counties, particularly near the Hudson River. Since it would also require a significantly longer crossing of the Hudson River, we do not recommend its use.

3.3 ALGONQUIN/IROQUOIS PIPELINE SYSTEM ALTERNATIVE

We also evaluated the combined use of the existing pipeline systems of Algonquin and Iroquois to transport gas from the Ramapo Station (MP 376.4) to a proposed delivery point with ConEd's facilities in Eastchester, New York, on Iroquois' system. This system alternative would require the construction of additional facilities on both the Iroquois and Algonquin systems and construction of the proposed Eastchester Expansion Project.^{10/}

Algonquin's system would require the following facilities (all of the pipeline looping would be 42-inch-diameter pipe):

- about 6 miles of looping extending upstream from Algonquin's Stony Point Compressor Station in Rockland County, New York;
- about 22.1 miles of looping extending downstream from the Stony Point Compressor Station and across the Hudson River in Rockland, Westchester, and Putnam Counties, New York;
- about 7.8 miles of looping extending downstream from Algonquin's Southeast Compressor Station in Putnam County, New York and Fairfield County, Connecticut;
- 1,000 horsepower (hp) of additional compression at the Stony Point Compressor Station in Rockland County, New York; and
- 1,500 hp of additional compression at the Southeast Compressor Station in Putnam County, New York.

Iroquois was asked to provide an estimate of the facilities that would be required if it were to transport 350,000 decatherms per day (dth/day) of natural gas from its existing interconnection with Algonquin at Brookfield, Connecticut, to its proposed delivery point with ConEd in Eastchester, New York. Iroquois stated it would need to construct the following facilities:

- 8,818 hp of additional compression at the Athens Compressor Station in Athens, New York;
- cooling facilities at the Dover Compressor Station in Dover, New York;
- a new compressor station in Brookfield, Connecticut (Iroquois MP 308.83) consisting of an 8,818 hp mainline compressor and an 8,818 hp compressor to boost gas pressure received from Algonquin into Iroquois' system (Brookfield Compressor Station); and
- a new 11,980 hp compressor station in Devon, Connecticut (Iroquois MP 336.95) (Devon Compressor Station).

The total cost for these alternative facilities on the Iroquois and Algonquin systems would be about \$199,000,000, plus the cost of the proposed Eastchester Expansion Project (\$173,900,000) compared to the estimated \$76,150,000 for construction of the proposed Millennium facilities between the Ramapo Station and the terminus in Mount Vernon, New York. This cost does not include the cost to construct a lateral to provide

^{10/} On April 28, 2000, Iroquois filed an application in Docket No. CP00-232-000 to construct the Eastchester Expansion Project. On December 15, 2000, Iroquois amended its application changing a portion of the pipeline route.

service to IBM, a proposed Millennium customer, or to the Bowline Power Plant. These additional costs might make the alternative economically unviable.

The system alternative would require a crossing of the Hudson River at a location that would be difficult to complete, as discussed previously. About 36 miles of 42-inch-diameter pipeline and 40,934 hp of new compression (additions at three existing compressor stations and two new compressor stations) plus the construction of Iroquois' pending Eastchester Expansion Project (32.8 miles of 24-inch-diameter pipeline and the addition of compression at 4 compressor stations, including 2 new stations), a 4.1-mile-long lateral to the Bowline Power Plant, and a lateral to IBM would be required for this alternative.

These alternative facilities would have greater impact since they would require at least 72.9 miles of pipeline compared to the proposed 45.4 miles of 24-inch-diameter pipeline proposed between Ramapo and Mount Vernon, New York. If a pipeline lateral would be required to serve IBM, there would be additional environmental impacts. Further, the location and amount of facilities that would need to be constructed on the ConEd system downstream of the proposed interconnection between Iroquois' Eastchester Expansion Project and ConEd's in Bronx, New York, are unknown. But, it can be assumed that nonjurisdictional pipeline facilities would be needed on ConEd's system to transport gas for the combined Iroquois and Millennium shippers. As previously discussed, construction of a new pipeline or a pipeline loop along Algonquin's existing 30- and 26-inch-diameter pipelines in Rockland County would require construction through several residential developments that have encroached on the existing pipelines. This alternative has not been proposed by either Algonquin or Iroquois, and we cannot require a company to construct and operate facilities for another pipeline company. For these reasons, we do not believe that this system alternative is a reasonable alternative to the proposed project.

4.0 ROUTE VARIATIONS

A number of landowners and area residents identified route variations to be considered in the EIS. Most of the variations were for specific reasons to address landowner concerns about the placement of the pipeline on their property. Others were suggested as a means to reduce environmental impact. We found that many of the variations could be accommodated with minor realignments (i.e., to avoid a tree, a well, etc.) that could be negotiated between Millennium and the landowner during easement acquisition. Others were not practicable or offered no significant environmental advantage. Discussed below are 21 route variations, including those at Little Valley, Union Center, and Yonkers. Also included are 8 variations identified to address landowner site-specific concerns.

4. LITTLE VALLEY VARIATIONS (MPs 88.0 to 93.7)

The Little Valley Variations were identified to address the concerns of two landowners who were both concerned about the impact of the creation of a new right-of-way through their forested properties. The Airport Variations were identified by Cattaraugus County Department of Economic Development, Planning and Tourism; the Hungry Hollow Variations were identified to reduce tree clearing within these properties; and the Coleman Variation was identified by one of the affected landowners (see figure 4.1-1).

Airport Variations (MPs 88.0 to 93.7)

The Airport Variation 1 and Variation 2 were identified by Cattaraugus County, and would avoid the properties of the landowners on or adjacent to Hungry Hollow Road (see figure 4.1-1). Both Airport Variations would leave Millennium's proposed route at MP 88.0 and turn south adjacent to the west side of a single track railroad that is under consideration for development of a bicycle trail. Both variations would continue adjacent to the railroad for about 1.5 miles, cross Little Valley Creek, and then turn east along the north side of Woodworth Hollow/Rock City Road. The variations would continue east along the edge of a golf course to the proposed Cattaraugus County Airport and would then turn south within the airport property to the Little Valley/Salamanca town line. At that point, the Airport Variations would split. Variation 1 would turn directly northeast for 3.4 miles to rejoin the proposed route at MP 93.7; Variation 2 would continue east along the town line for about 1.9 miles and then northeast for 1.8 miles to the proposed route at MP 93.7.

The Airport Variations would be 1.7 miles (Variation 1) and 2.0 miles (Variation 2) longer than the proposed route, affecting about 30 percent more land than the proposed route (see table 4.1-1). Within the common segment, the Airport Variations would cross Little Valley Creek (about 50 feet wide at the crossing location), would parallel the creek for about 1,500 feet, would cross a golf course and the proposed new Cattaraugus County Airport. The proposed route and Airport Variations would require about the same amount of forest clearing. The proposed route and Variation 2 would cross about the same distance within the NYSDEC Reforestation land/Rock City State Forest (2,600 feet for the proposed route and 2,400 feet for Variation 2). Variation 1 would cross 3,900 feet of NYSDEC reforestation land.

The most significant disadvantages of the Airport Variations are their longer length and their greater potential for environmental impact. In addition, if the Cattaraugus County Airport is approved and ultimately built, placing the pipeline within the airport boundaries may not be the best long-term location for the pipe. Although the crossing of the proposed airport boundaries could be reduced, this would require a much longer crossing of the NYSDEC Reforestation/Rock City State Forest land (an additional 0.8 mile). For these reasons, we do not recommend the Airport Variations.

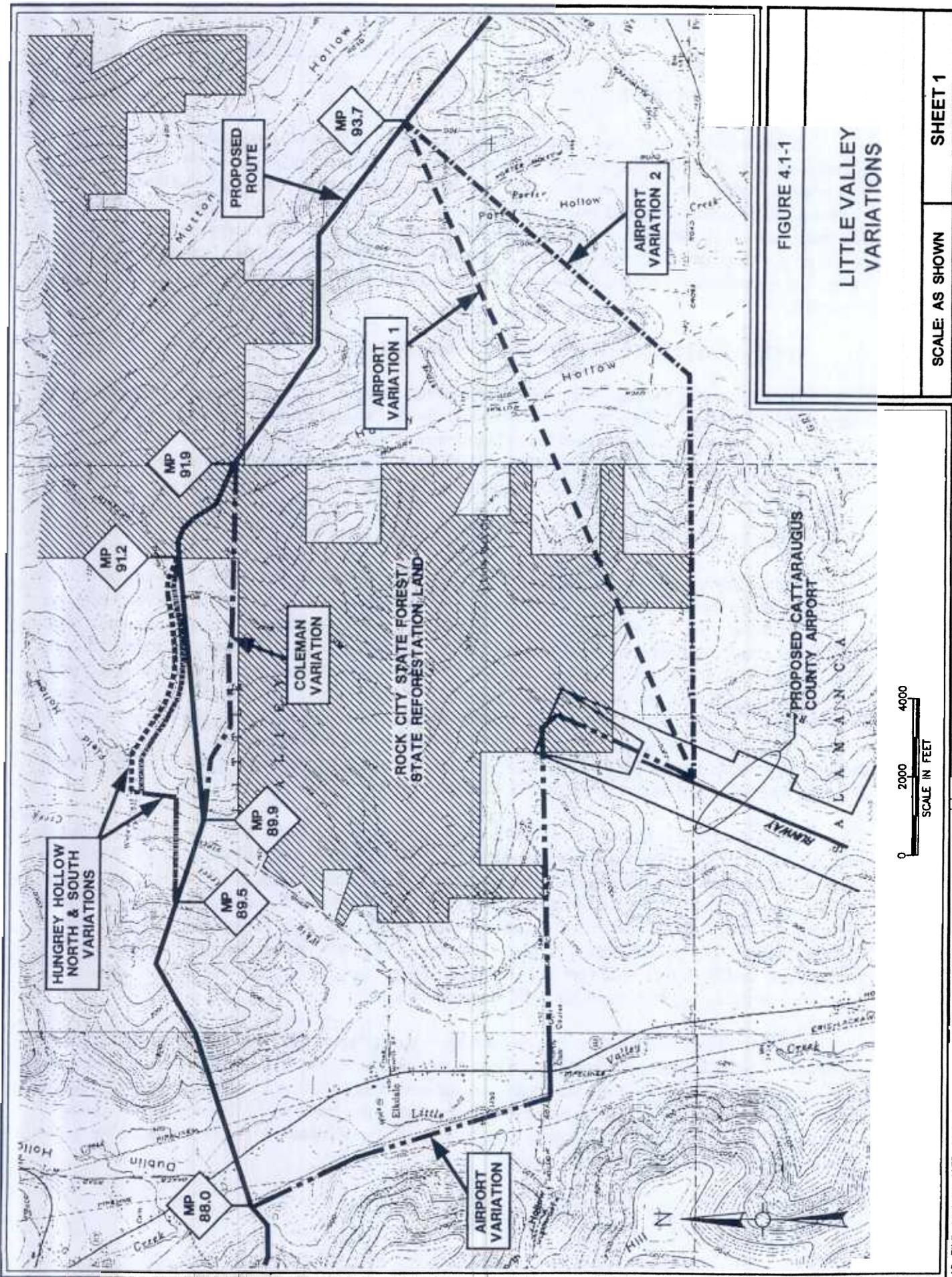


FIGURE 4.1-1

LITTLE VALLEY VARIATIONS

SCALE: AS SHOWN

SHEET 1

TABLE 4.1-1
Comparison of Airport Variations 1 and 2
with the Corresponding Segment of the Proposed Route

| County | Mileposts/ Environmental Factor | | Proposed Route | Airport Variation 1 | Airport Variation 2 | |
|-------------|---|---|------------------------|------------------------|------------------------|--------|
| Cattaraugus | MPs 88.0 to 93.7 | • Total length | ft | 30,300 | 39,200 | 40,900 |
| | | | mi | 5.7 | 7.4 | 7.7 |
| | • Land requirements ^{a/} | Construction right-of-way | ac | 52.2 | 67.5 | 70.4 |
| | | | Permanent right-of-way | ac | 34.8 | 45.0 |
| | • Length adjacent to existing road/railroad | mi | 0.0 | 2.0 | 2.0 | |
| | • Number of waterbodies crossed | Number over 50 feet wide | no | 3 | 9 | 10 |
| | | | no | 0 | 1 | 1 |
| | • Forest crossed | Forest affected during construction ^{b/} | ft | 26,400 | 26,100 | 24,300 |
| | | | ac | 45.5 | 44.9 | 41.8 |
| | • NYSDEC Reforestation/Rock City State | Forest land crossed | ft | 2,600 | 3,900 | 2,400 |
| | | | ft | 0 | 4,600 | 4,600 |
| | • Airport land crossed | ft | 0 | 2,300 | 2,300 | |
| | • Golf course land crossed | ft | 0 | | | |

^{a/} Calculations are based on a 75-foot-wide construction right-of-way and a 50-foot-wide permanent right-of-way.
^{b/} Forest estimated from USGS topographic maps. Acreage calculation based on a 75-foot-wide construction right-of-way.

Hungry Hollow Variations - North and South (MPs 89.5 to 91.2)

We examined two variations to minimize tree clearing between MPs 89.5 and 91.2 (see figure 4.1-1). The Hungry Hollow Variation would deviate from Millennium's proposed route at about MP 89.5 and proceed east along the southern boundary of the Golaszewski property. The variation would cross about 0.2 mile of forest and 0.2 mile of agricultural/open land west of Whig Street, and 0.3 mile of agricultural/cleared land east of Whig Street. At MP 90.2, the Hungry Hollow Variation would split into the Hungry Hollow North and Hungry Hollow South Variations.

The Hungry Hollow North Variation would cross Hungry Hollow Road and continue east about 20 feet north of the roadway, crossing agricultural/pasture land for about 0.1 mile, Field Hollow Road, and roadside forests for about 0.9 mile. It would cross one driveway and Hungry Hollow Road and proceed southeast for 0.2 mile, crossing additional forest, before rejoining the corresponding segment of the proposed route at about MP 91.2.

The Hungry Hollow South Variation would proceed east along the south side Hungry Hollow Road, about 20 feet south of the road, crossing open land and roadside forest for about 0.4 and 0.6 mile, respectively. It would also cross four driveways, Little Rock City Road and then continue southeast for 0.2 mile, crossing additional forest, before rejoining the corresponding segment of the proposed route near MP 91.2. A comparison of the Hungry Hollow Variation - North and South route variations and the corresponding segment of the proposed route is included in table 4.1-2.

| County | Mileposts/ Environmental Factor | Unit | Proposed Route | Hungry Hollow Variations | |
|--|------------------------------------|------|-------------------|-----------------------------|-------|
| | | | | North | South |
| Cattaraugus | MPs 89.5 to 91.2 | | | | |
| | • Total length | mi | 1.7 | 1.9 | 1.9 |
| | • Estimated land requirements | | | | |
| | Construction right-of-way | ac | 15.4 | 17.3 | 17.3 |
| | Permanent right-of-way | ac | 10.3 | 11.5 | 11.5 |
| | • Total agricultural land crossed | ac | 1.8 | 5.5 | 8.2 |
| | • Total forest crossed | ac | 13.6 | 11.8 | 9.1 |
| • Total perennial water body crossings | no | 4 | 3 | 3 | |
| • Residences within 50 feet of the construction work area | no | 0 | 0 | 0 | |

Note: Acreage calculations are based on a 75-foot-wide construction right-of-way and a 50-foot-wide permanent right-of-way.

The Hungry Hollow Variations would be 0.2 mile longer than the corresponding segment of the proposed route and would affect 1.9 more acres of land. The North Variation would affect 3.7 more acres of agricultural land and 1.8 less acres of forested land, whereas the South Variation would affect 6.4 more acres of agricultural land and 4.5 less acres of forested land than the corresponding segment of the proposed route. Both the North and South Variations would cross 1 less perennial waterbody and no residence would be within 50 feet of the construction work area of any of these routes.

The primary concern of one of the landowners with the proposed route is that it would affect a relatively undisturbed tract of forest by creating new right-of-way between MPs 89.5 and 91.2. The advantages of the Hungry Hollow Variations are similar in that neither alignment would place the construction work area within 50 feet of an existing residence and both routes would cross Whig Street Creek and 2 tributaries. In addition, both variations would affect less undisturbed forest and would be adjacent to an existing road. The disadvantages of the Hungry Hollow Variations include the longer length (about 0.2 mile) and additional land use impacts, including additional land requirements for construction and operation. Millennium indicated that the primary disadvantage with the Hungry Hollow North Variation is that it would be between Hungry Hollow Road and parallel to a tributary to Whig Street Creek. Although it may be possible to construct the pipeline within the road berm/stream bank interface, such construction could impact both features. We agree. The primary disadvantage of the Hungry Hollow South Variation would be the crossing through the front yards of several vacation homes. Whereas, the proposed route would be along the back property lines of these residences. A landowner on Hungry Hollow South commented that the area along the road is the only place that is level enough for a septic system which he plans to construct. Since neither of the Hungry Hollow Variations offer a significant environmental advantage and would interfere with planned land use, we do not recommend their use.

Coleman Variation (MPs 89.9 to 91.9)

The Coleman Variation was proposed by the landowner near MP 90.7, to avoid a stand of old growth forest on his property, minimize tree clearing within the extra work space on the edge of the property, and relocate the pipeline so as to increase the distance between the pipeline and his residence (see figure 4.1-1). The Coleman Variation would deviate from Millennium's proposed route at MP 89.9 and proceed directly east, crossing about

1.8 miles of forest. It would cross Little Rock City Road and Hungry Hollow Road before rejoining the corresponding segment of the proposed route at about MP 91.9. A comparison of the Coleman Variation and the corresponding segment of the proposed route is included in table 4.1-3.

The major advantage of the Coleman Variation is that it would be about 0.2 mile shorter, thus requiring 2.7 acres and 1.2 acres less land for construction and operation, respectively. The construction work area for either route would not be within 50 feet of any existing residence. The Coleman Variation would cross 2 fewer waterbodies and affect 2.7 acres less forest than the corresponding segment of the proposed route, but still affect 15.5 acres of forest between MPs 89.9 and 91.9. However, the proposed route would affect less state forest land between MPs 89.9 and 91.9.

| County | Mileposts/ Environmental Factor | Unit | Proposed Route | Coleman Variation |
|--|--|------|-------------------|----------------------|
| Cattaraugus | MPs 89.9 to 91.9 | | | |
| | • Total length | mi | 2.0 | 1.8 |
| | • Estimated land requirements | | | |
| | Construction right-of-way | ac | 18.2 | 15.5 |
| | Permanent right-of-way | ac | 12.1 | 10.9 |
| | • Total agricultural land crossed | ac | 0 | 0 |
| | • Total forest crossed | ac | 18.2 | 15.5 |
| | • Total perennial water body crossings | no | 4 | 2 |
| • Residences within 50 feet of the construction work area | no | 0 | 0 | |

Note: Acreage calculations are based on a 75-foot-wide construction right-of-way and a 50-foot-wide permanent right-of-way.

Millennium indicated that it has not been able to determine the type or quality of timber on either the variation or the proposed route because the landowners have denied access. Since the extra work space on the east side of the property was estimated using aerial photography and topographic maps, Millennium states that it would reevaluate the size of this work area and make every effort to minimize clearing.

During the development of the proposed route, Millennium stated that it worked with the NYSDEC, the designated land management agency, to identify a preferred alignment across the state reforestation land. Although the Coleman Variation would affect about 2.7 acres less forest than the corresponding segment of the proposed route, the Variation would affect a greater amount of vegetation on the important state reforestation lands. In addition, Millennium has stated that it would attempt to reduce the estimated size of construction work areas at waterbody crossings, further reducing the temporary construction workspace requirements. Millennium also stated that the Rock City geological formation^{11/} is reportedly present along the southern boundary of the Coleman property and near the east end of the Coleman Variation.

Because the proposed route across the state reforestation lands was developed in consultation with the appropriate land management agency and Millennium has stated that it would attempt to reduce the construction

^{11/} The Rock City formations are unique geologic features that were not affected by glaciation. They are a visual resource and have a Native American significance.

right-of-way to the maximum extent practicable to limit unnecessary tree clearing, and because the variation could impact the unique Rock City formations, we do not recommend that Millennium incorporate the Coleman Variation into its proposed route.

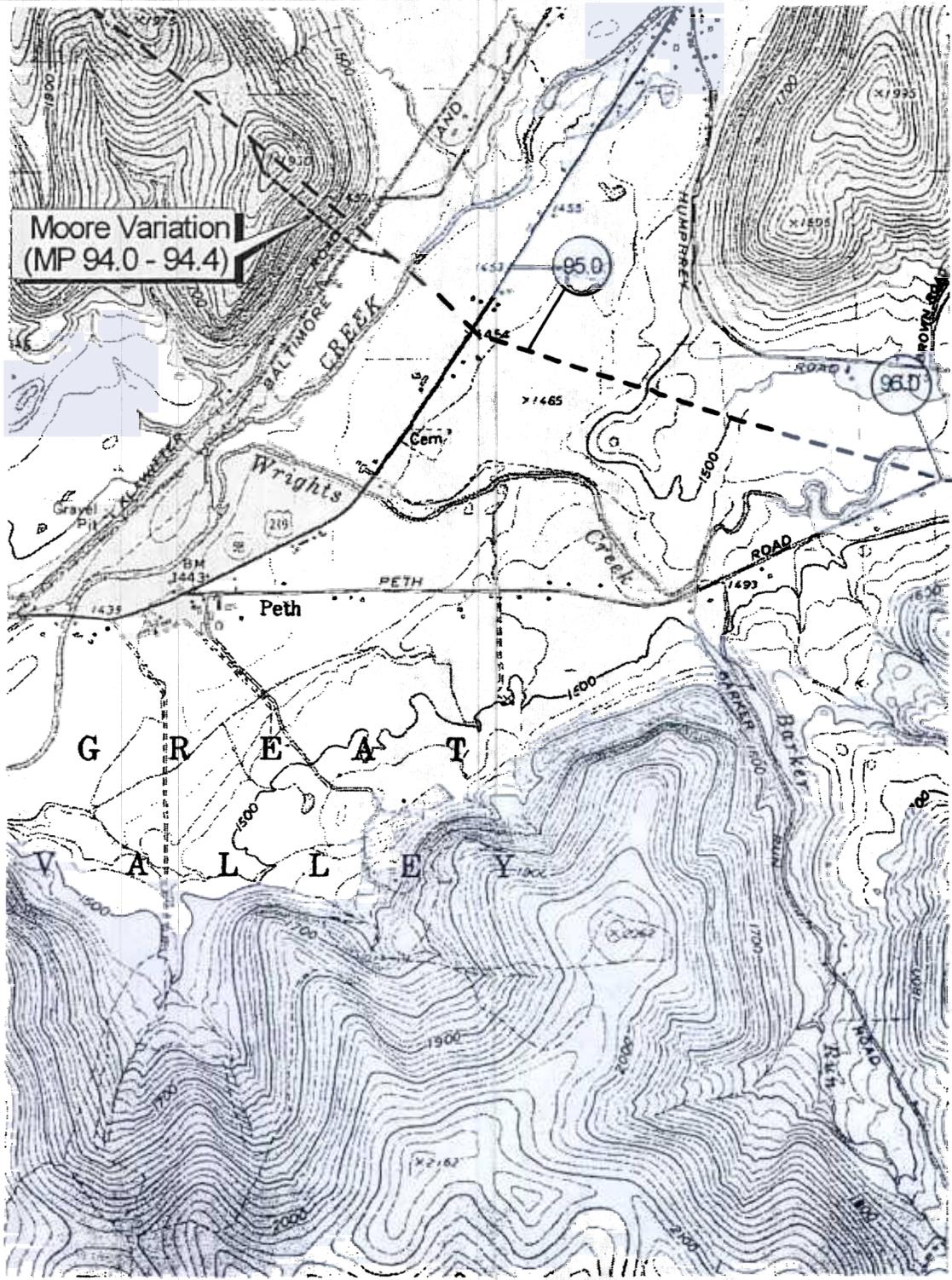
4.2 MOORE VARIATION (MPs 94.0 to 94.4)

The Moore Variation was identified by the NYSDA&M and Millennium to avoid removal of mature sugar bush. It would deviate from Millennium's proposed route at about MP 94.0 and move the pipeline about 200 feet southwest of the corresponding segment of the proposed route (see figure 4.2-1). The variation would proceed in an southeasterly direction crossing about 0.1 mile of agricultural land and 0.3 mile of forest. It would cross Klawitter Road and a railroad before rejoining the corresponding segment of the proposed route at about MP 94.4.

The Moore Variation would be about 95 feet longer than the corresponding segment of the proposed route and would avoid a large production stand of sugar maple trees. In all aspects, both routes would require new right-of-way affecting approximately equal amounts of agriculture (0.9 acre) and forest (2.7 acres). No waterbodies, residences, or public facilities would be affected. However, one wetland would be affected by both the variation and the corresponding segment of the proposed route. One archaeological site (Site CAT-195) may also occur on the variation. Although the entire boundary of this site has not been determined because of denied access, it is likely that this resource, or similar resources, may be present on the variation. However, because this variation would avoid a large production stand of sugar maples and because other environmental impacts would be similar, we concur with Millennium's proposal to incorporate the Moore Variation into its proposed route between MPs 94.0 and 94.4.

4.3 GRIMINS VARIATION (MPs 185.0 to 186.0)

The Grimins Variation was identified by the landowner and would involve a crossover of the proposed pipeline from the south side of existing Line A-5 to the north side (see figure 4.3-1). It would deviate from the proposed route at MP 185.0 and proceed east before rejoining the proposed route at MP 186.0. The advantages of the Grimins Variation are that it would increase the distance of the proposed pipeline from two residences, and from the water supply wells to greater than 100 feet although the wells would remain within 150 feet of the construction work area. No residences would be within 50 feet of either route. This variation would also preserve the integrity of a hedgerow that buffers residences from wind. No wetlands, waterbodies, or public facilities would be affected by the Grimins Variation. The primary disadvantage of the Grimins Variation is that it would increase the pipeline length by about 40 feet and result in construction impacts outside of the existing right-of-way through an abandoned agricultural field that is overgrown with scrub-shrub vegetation. It would require 0.7 acre more land for construction and 0.4 acre more land for permanent right-of-way than would the corresponding segment of the proposed route. Because the variation would alleviate impacts on two residences, we concur with Millennium's proposal to incorporate the Grimins Variation into its proposed route.



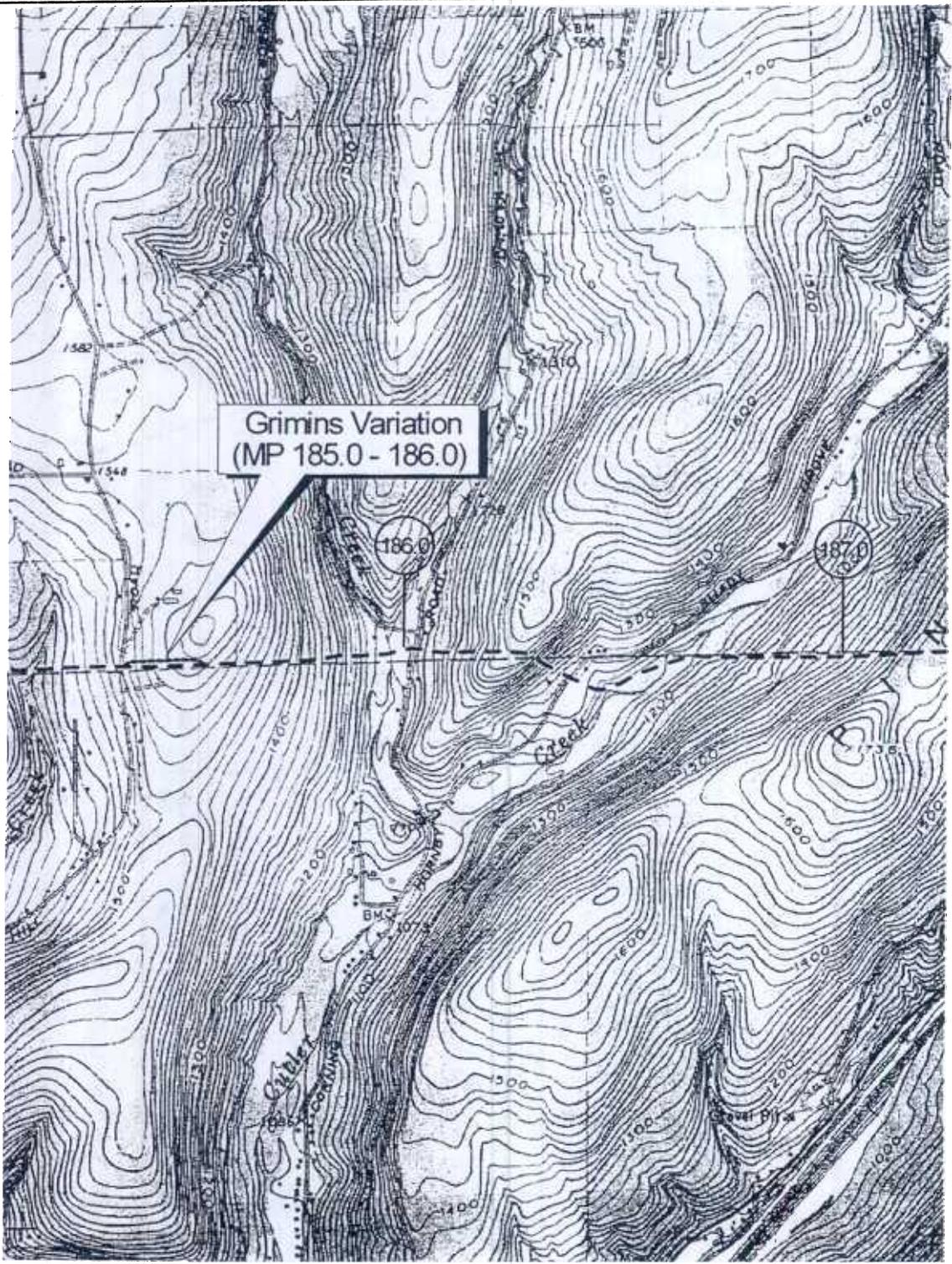
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FIGURE 4.2-1

MOORE VARIATION

SHEET 1



1000 0 1000 2000 Feet



FIGURE 4.3-1

GRIMINS VARIATION

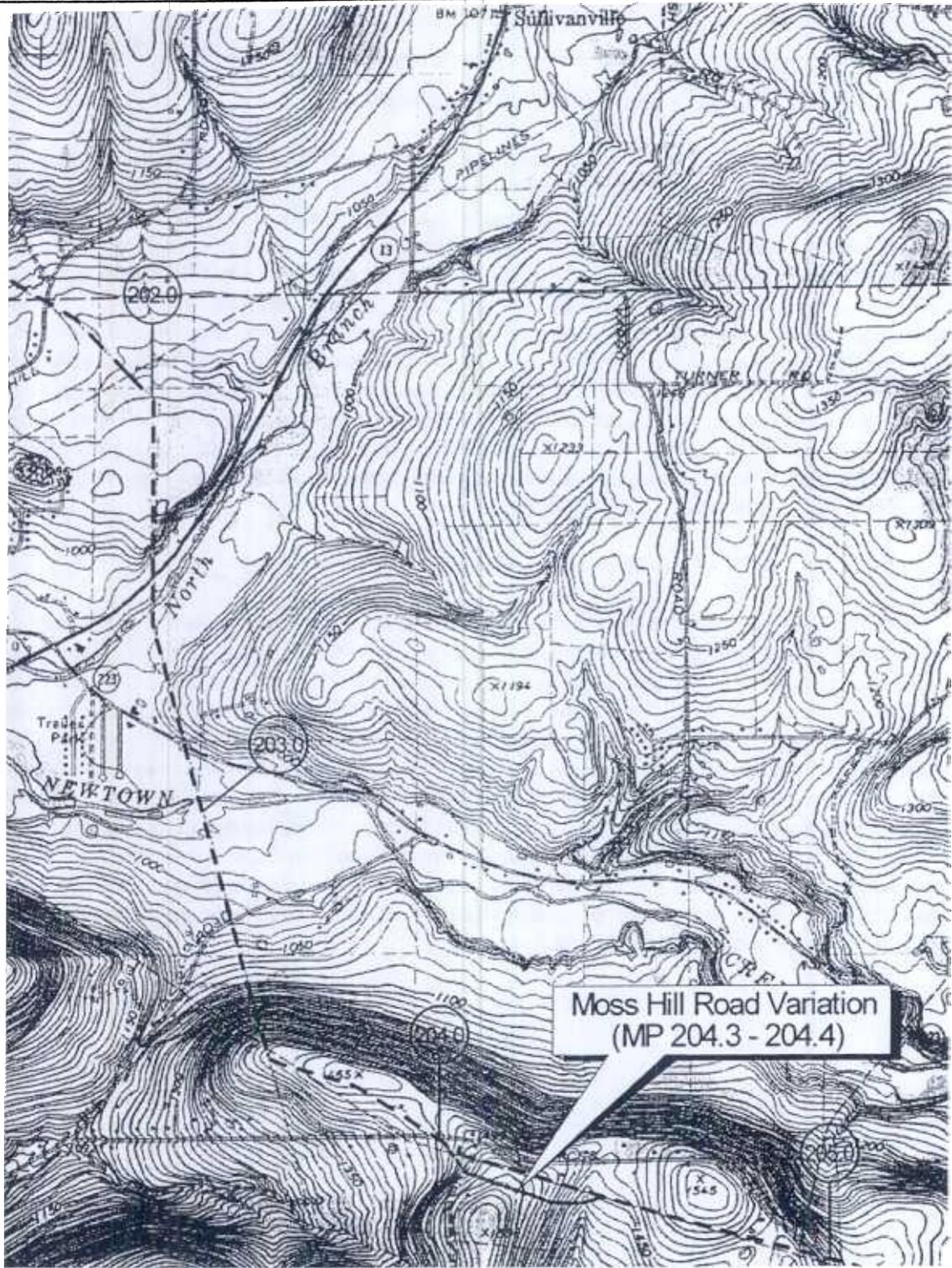
SHEET 1

4.4 MOSS HILL ROAD VARIATION (MPs 204.3 to 204.4)

A landowner on Moss Hill Road in Horseheads, New York (Whipple) commented that several parties, including representatives from Millennium, had discussed a minor route variation that would increase the separation between the proposed pipeline and residences located on Moss Hill Road (MP 204.3) (see figure 4.4-1). As proposed by the landowners along Moss Hill Road and Millennium, the Moss Hill Road Variation would deviate from Millennium's proposed route at MP 204.3 and turn southeast for about 0.1 mile before turning and paralleling the proposed route for about 0.3 mile. It would rejoin the proposed route at MP 204.4. The Moss Hill Road Variation would be about 130 feet longer than the proposed route. Whereas the proposed route would cross through mostly cleared or open scrub land, the variation would cross mostly forest. Whereas the proposed route would be within 50 feet of five residences, the variation would be within 50 feet of no residences. No public facilities, waterbodies, or wetlands would be affected by either the proposed route or the variation. Although the variation would require the clearing of about 3.6 acres more forest, we believe that the concerns of the residents outweigh the impact of forest clearing on their properties and concur with Millennium's proposal to incorporate the Moss Hill Road Variation into the proposed route.

4.5 LARISON VARIATION (MPs 213.6 to 214.0)

The Larison Variation was identified by NYSDA&M and Millennium to avoid a sugar bush operation. It would involve moving the pipeline from the south side to the north side of Line A-5 (see figure 4.5-1). The variation would deviate from Millennium's proposed route near MP 213.6, cross over Line A-5 and continue on the north side of Line A-5 to MP 214.0. The variation would be about 23 feet longer than the corresponding segment of the proposed route and would require new right-of-way adjacent to the existing Line A-5 right-of-way. Both the Larison Variation and the corresponding segment of the proposed route would cross approximately equal amounts of agricultural land and forest, but the variation would affect about 0.1 more acre of agricultural land and forest than the corresponding segment of the proposed route. No waterbodies, residences, or public facilities would be affected. However, one wetland would be affected by both the variation and the corresponding segment of the proposed route. Since the Larison Variation would avoid a sugar bush operation and impacts on sugar maple trees, and other environmental impacts would be not be significant, we concur with Millennium's proposal to incorporate the Larison Variation into the proposed route.



Moss Hill Road Variation
(MP 204.3 - 204.4)

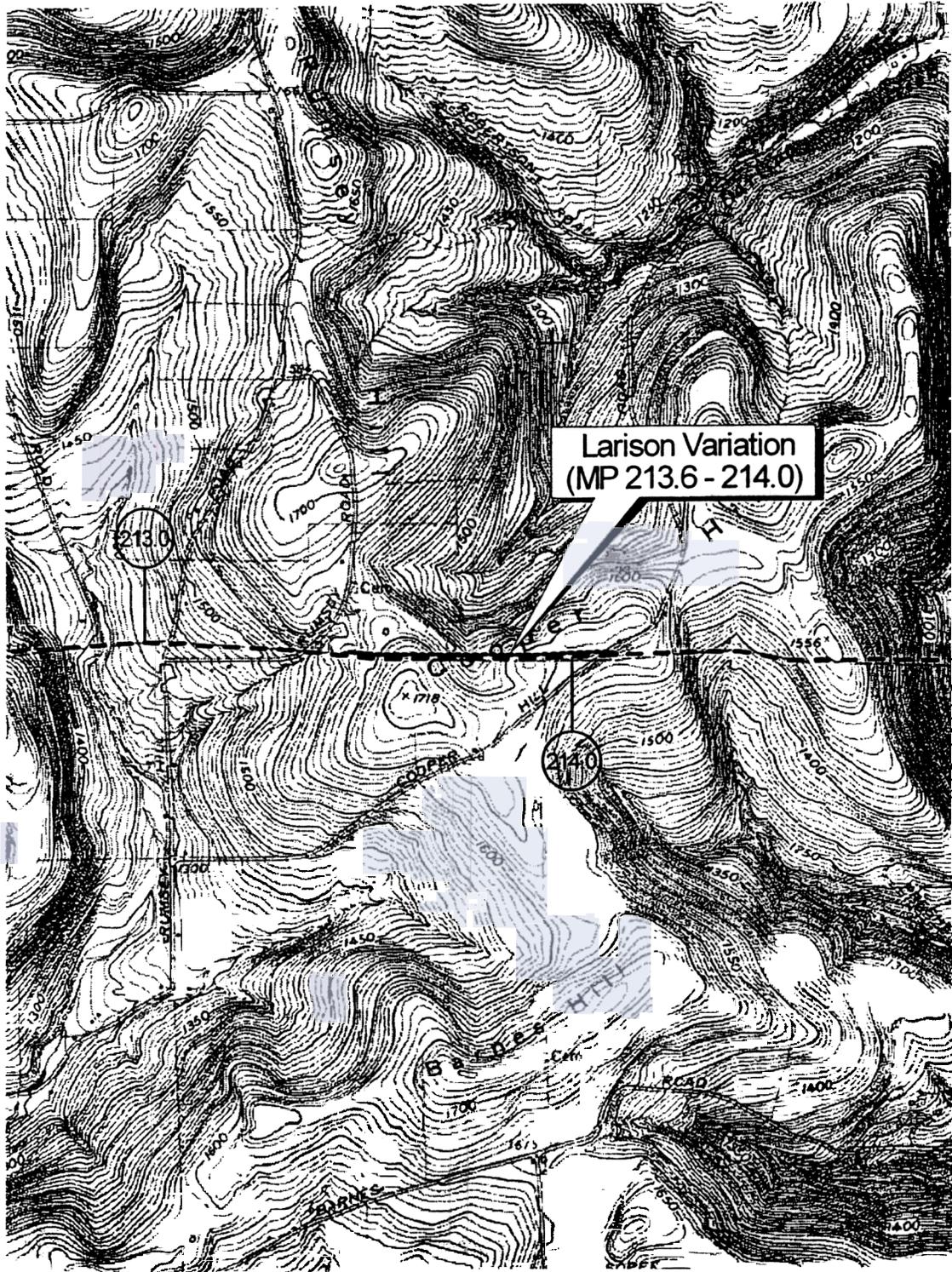
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FIGURE 4.4-1

**MOSS HILL ROAD
VARIATION**

SHEET 1



1000 0 1000 2000 Feet



FIGURE 4.5-1

LARISON VARIATION

SHEET 1

4.6 BRADLEY CREEK VARIATIONS (MPs 241.1 to 242.6)

Bradley Creek Variation

The Bradley Creek Variation was proposed by a resident on Bradley Creek Road at MP 241.7 to reduce impacts to properties on Pitkin Hill and Bradley Creek Roads adjacent to the proposed route (see figure 4.6-1). The Bradley Creek Variation would leave the proposed route and the powerline right-of-way at a point about 2,700 feet west of Pitkin Hill Road. The variation would turn south and continue along the existing New York State Electric and Gas (NYSEG) pipeline right-of-way for about 3,700 feet to the intersection with the existing Line A-5 pipeline right-of-way. At this point, it would turn east, cross Bradley Creek Road, and follow Line A-5 to a point about 1,700 feet west of Farm to Market Road. Here, the variation would turn northeast from the Line A-5 right-of-way along NYSEG's pipeline right-of-way to rejoin the NYSEG powerline and the proposed route at MP 242.6. A comparison of the significant environmental characteristics of the Bradley Creek Variation with the corresponding segment of the proposed route is in table 4.6-1.

| County | Mileposts/ Environmental Factor | Unit | Proposed Route | Bradley Creek Variation |
|--|--|------|-------------------|----------------------------|
| Broome | MPs 241.1 to 242.6 | | | |
| | • Total length | mi | 1.8 | 2.4 |
| | • Estimated land requirements | | | |
| | Construction right-of-way | ac | 15.5 | 23.0 |
| | Permanent right-of-way | ac | 10.9 | 15.2 |
| | • Total open land crossed | ac | 10.1 | 7.1 |
| | • Total agricultural land crossed | ac | 0 | 9.5 |
| | • Total forest land crossed | ac | 0 | 4.0 |
| | • Total perennial water body crossings | no | 2 | 1 |
| • Residences within 50 feet of the construction work area | no | 0 | 0 | |

Note: Acreage calculations are based on a 75-foot-wide construction right-of-way and a 50-foot-wide permanent right-of-way.

We also attempted to identify a modification to this variation in the vicinity of Bradley Creek Road to move the pipeline away from the area of concern. However, we found that any modifications would require additional forest clearing and the creation of a new right-of-way through forested areas. It would also affect new landowners and would not significantly reduce impact on the areas of concern. Therefore, we did no further analysis of the modification.

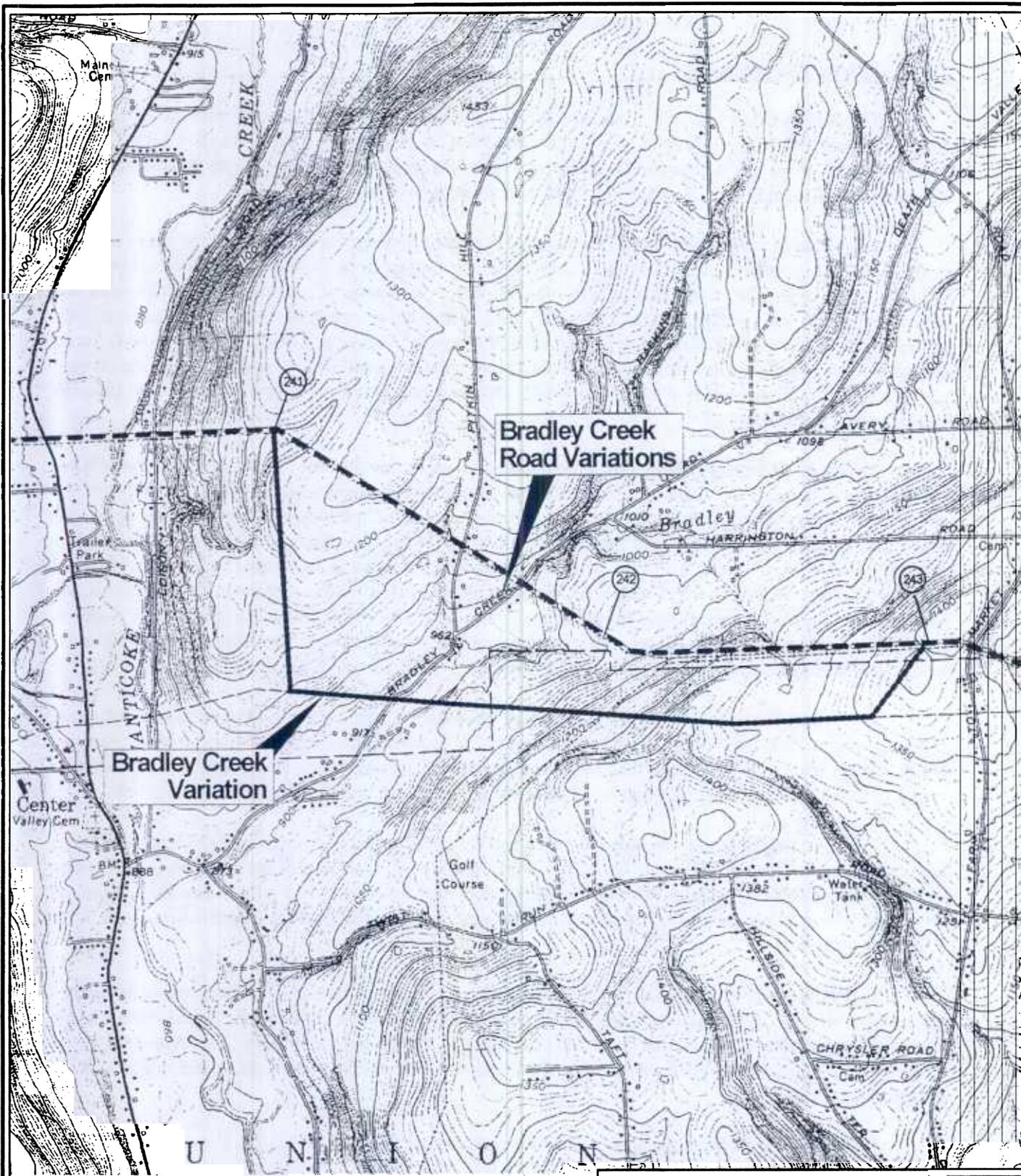


FIGURE 4.6-1

**BRADLEY CREEK
VARIATIONS**

SHEET 1

The Bradley Creek Variation would be 0.6 mile longer than the corresponding segment of the proposed route, and would affect 7.5 more acres of land including 9.5 more acres of agricultural land and 4.0 more acres of forested land. However, the variation would cross 1 fewer perennial waterbodies. The variation would cross a property of the Saint Francis Hermitage and part of the Kodey Tree Farm.

Supporters of the Bradley Creek Variation identified the following concerns with the proposed route: 1) it would preclude access to properties (specifically the Lewis properties on Bradley Creek Road at about MP 241.7) both during and after construction, 2) it would interfere with the use of trucks and heavy equipment that are required for business activities on the Lewis properties, 3) it would cross a septic system and require removal of trees on the east side of Bradley Creek Road on the Thompson and Scone properties, and 4) it would affect a ground fed water supply system (specifically the Supa property at about MP 242.0). In addition, construction of the proposed route would result in erosion and other problems because of the steep slopes and erodible soils between MPs 242.0 and 242.5.

Millennium proposes to place its pipeline between the powerline structures within the existing powerline right-of-way. The issue with access is associated with the proposed crossing of the Lewis driveway and the concern that, either during construction or operation, this access for the residence and business would be obstructed, either temporarily during construction or during an emergency if the pipeline were to break at the driveway. To address this issue, Millennium has proposed a minor route variation on the Lewis property to avoid crossing the driveway (see Bradley Creek Road Variation below). While we did not observe a lot of heavy truck movement on the Lewis property, it is likely that heavy equipment is used as part of the landowner's business. Millennium would provide additional cover if necessary to protect its pipeline from heavy equipment. This would be done in compliance with the regulations of the USDOT (49 CFR section 192, Subpart C, Pipe Design).

On the east side of Bradley Creek Road, the pipeline would cross a septic system within the powerline right-of-way and could require removal of several trees (including an apple tree) that serve as screening between two residences, and the residences and the road. However, Millennium states that it would bore the road, the septic system, and the tree screening. The apple tree would be fenced and protected throughout construction.

While we recognize that construction may affect the spring on the Supa property (which supplies water to the residence and barn), Millennium has committed to, and we will require, pre- and post-construction water quality testing of wells and springs. In addition, Millennium has identified and we have recommended a minor route variation to move the pipeline further from the potentially affected spring (see Bradley Creek Road Variations below).

Finally, side slopes are typically encountered during the construction of pipelines and special techniques have been developed to address construction-related issues. Side hill construction along the proposed route in this area would not be considered unusual because both the proposed route and the Bradley Creek Variation would cross the same ridge. Although about 0.2 mile apart, both routes would most likely encounter similar soil and topographic conditions.

We have not identified any significant environmental advantage with the Bradley Creek Variation. Both routes are similar in that neither alignment would place the construction work area within 50 feet of an existing residence and both routes would cross Bradley Creek. Many commentors on the DEIS were strongly opposed to the Bradley Creek Variation. The disadvantages of the Bradley Creek Variation include its longer length (about 3,300 feet) and additional land use impacts, including additional impacts on agricultural and forested areas. We also believe that the concerns of the Supas and Lewises can be mitigated without the need for the added environmental impact. Because we believe that the disadvantages of the Bradley Creek Variation outweigh its advantages, we do not recommend it.

Bradley Creek Road Variations (MPs 241.7 and 242.0)

These variations were identified by Millennium to reduce impact on the Lewis and Supa properties (see discussion above). At the Lewis property, Millennium proposes to move the pipeline north to avoid crossing the driveway for the Lewis residence (MP 241.7) (see figure 4.6-1). Since this route variation would partially address the concerns identified by the landowner, we concur with Millennium's proposal to incorporate the route variation on the Lewis property into its proposed route.

At the Supa property, Millennium proposes to move the pipeline south to avoid a seasonal spring and to maintain about 165 feet between another water supply spring and the construction work area (MP 242.0) (see figure 4.6-1). Since this route variation would partially address the concerns identified by the landowner, we concur with Millennium's proposal to incorporate the route variation on the Supa property into the proposed route.

While construction impact on this landowner's water supply system may be remote, we believe that it could affect the water supply if the trench diverts the water flow. Therefore, we recommend that:

Millennium should prepare a report that contains the following information regarding the water supply system on the Supa property (approximate MP 242.0):

- a. **the elevation of the spring outlet and cistern;**
- b. **the water bearing stratum for the spring at source, if possible;**
the depth to water along the pipeline trench, and the water bearing strata along the pipeline trench and orthogonal (right angle) downhill to spring;
- d. **if the pipeline trench or sidehill cut would intersect water bearing stratum that feeds the spring or the spring's water source, determine if the pipeline trench would convey water away from the spring based on trench elevations; and**
if the pipeline trench would convey water away from the spring, develop engineering and/or other mitigation measures (including a reroute) to maintain uninterrupted flow to the spring and cistern.

The report should include site-specific diagrams as necessary to illustrate the flow of water to the spring and cistern and should be filed with the Secretary for review and written approval by the Director of OEP before construction in this area.

4.7 MICHA VARIATIONS (MPs 243.4 to 245.7)

A landowner in Johnson City, New York, commented that six existing utility lines currently cross his property at about MP 243.5 and requested that any additional pipelines be placed within existing easements to minimize impacts. The Micha property is east of Union Center, where Millennium's pipeline would be installed between the powerline structures to about MP 243.5. At the western edge of the Micha property, the proposed route would rejoin the existing Line A-5 corridor, where Millennium proposes to install the new pipeline using a 25-foot offset from the existing pipeline. This would require an additional 25 feet of permanent right-of-way outside of the existing corridor. Millennium has maximized the use of the existing Columbia right-of-way in this area and the additional 25 feet of permanent right-of-way would not significantly affect future agricultural operations. However, the NYSDA&M commented that there may be benefits associated with moving out of

agricultural land and onto new right-of-way in this location. Therefore, we have identified and evaluated two route variations in this location and compared them to the corresponding segment of the proposed route (see figure 4.7-1).

Micha Variation (MPs 243.4 to 244.7)

This route variation was identified by the affected property owner to minimize the length of the proposed crossing through active agricultural lands. The landowner apparently consulted with most of the affected landowners along the variation for their approval of the reroute. The variation would deviate from the proposed route just east of Cummings Road at about MP 243.4. At this point, the variation would continue southeast within the existing powerline right-of-way for about 1.0 mile to a point east of Case Road, where it would turn northeast, and cross the Goodrich and Morlando properties before rejoining the proposed route at about MP 244.7, about 650 feet west of Oakdale Road. All of the land use associated with the proposed route and the Micha Variation is open. A comparison of the significant environmental characteristics of the Micha Variation with the corresponding segment of the proposed route is in table 4.7-1.

| County | Mileposts/ Environmental Factor | Unit | Proposed Route | Micha Variation |
|--------|--|------|-------------------|--------------------|
| Broome | MPs 243.4 to 244.7 | | | |
| | • Total length | mi | 1.3 | 1.5 |
| | • Estimated land requirements | | | |
| | Construction right-of-way | ac | 11.4 | 13.4 |
| | Permanent right-of-way | ac | 7.6 | 8.9 |
| | • Residences within 50 feet of the construction work area | no | 0 | 0 |

Note: Acreage calculations are based on a 75-foot-wide construction right-of-way and a 50-foot-wide permanent right-of-way.

Our review of this variation was based on existing aerial photography and topographic maps, and indicates that, while it would reduce the pipeline crossing through the Micha property, construction would require an additional 1,200 feet of pipeline and the creation of about 2,500 feet of new right-of-way. This new right-of-way would be along the side slopes, which likely would require additional construction work areas. Further, while the Goodrich and Morlando properties currently contain utility rights-of-way, the Micha Variation would cross diagonally through properties on land currently unencumbered by utility easements, restricting future use of these properties.

While use of this variation would result in an increase in environmental impacts in that the total land requirement for construction would increase by about 2 acres and the route would be 0.2 mile longer as compared to the proposed route, the variation would significantly reduce impact on residential properties on Town Line Road that are currently bisected by the existing Line A-5 by moving the proposed pipeline farther from them. The affected landowners along the proposed route and the Micha Variation support use of the variation, as well as the NYSDA&M and Millennium. Therefore, we have no objection to its use and concur with Millennium's proposal to incorporate the Micha Variation into its proposed route.

A landowner (Curran) also proposed a route variation to minimize impact on his property in the vicinity of the Micha Variation. This variation would continue along the powerline as described for the Micha Variation, but instead of rejoining the proposed route at MP 244.7, the variation would continue southeast along the powerline, and then northeast adjacent to another powerline until that powerline intersects the proposed route. This variation would be considerably longer since the powerline trends south away from the pipeline. It would also require crossing of large pond near the point where it would rejoin the proposed route. Because the landowner's concerns were resolved with the adoption of the Micha Variation, we did no further analysis of this variation.

Town Line Road Variation (MPs 243.0 to 244.2)

The Town Line Road Variation would deviate from the proposed route just east of Farm to Market Road at about MP 243.0, at the intersection of the proposed route and the Maine/Union Town Line (see figure 4.7-1). The variation would then continue east adjacent to the town boundary, cross Cummings Road, and then follow the south side of Town Line Road for about 4,200 feet, where it would turn southwest for about 600 feet before rejoining the proposed route on the existing Line A-5 right-of-way at about MP 244.2. A comparison of the significant environmental characteristics of the Town Line Road Variation with the corresponding segment of the proposed route is in table 4.7-2.

As with the Micha Variation, this variation would minimize disruption to agricultural lands by placing the pipeline at the edge of the fields adjacent to Town Line Road. However, residents along Town Line Road expressed opposition to this route variation, both in written comments on the DEIS and during our field review of the route. The most often cited concern was about having two rights-of-way across their properties. Therefore, we do not recommend the Town Line Road Variation.

TABLE 4.7-2
Comparison of the Town Line Road Variation
with the Corresponding Segment of the Proposed Route

| County | Mileposts/ Environmental Factor | Unit | Proposed Route | Town Line Road Variation |
|--------|--|------|-------------------|--------------------------------|
| Broome | MPs 243.0 to 244.2 | | | |
| | • Total length | mi | 1.1 | 1.1 |
| | • Estimated land requirements | | | |
| | Construction right-of-way | ac | 9.6 | 9.8 |
| | Permanent right-of-way | ac | 6.4 | 6.5 |
| | • Residences within 50 feet of the construction work area | no | 0 | 0 |

Note: Acreage calculations are based on a 75-foot-wide construction right-of-way and a 50-foot-wide permanent right-of-way.

4.8 FAVA VARIATION (MP 249.4)

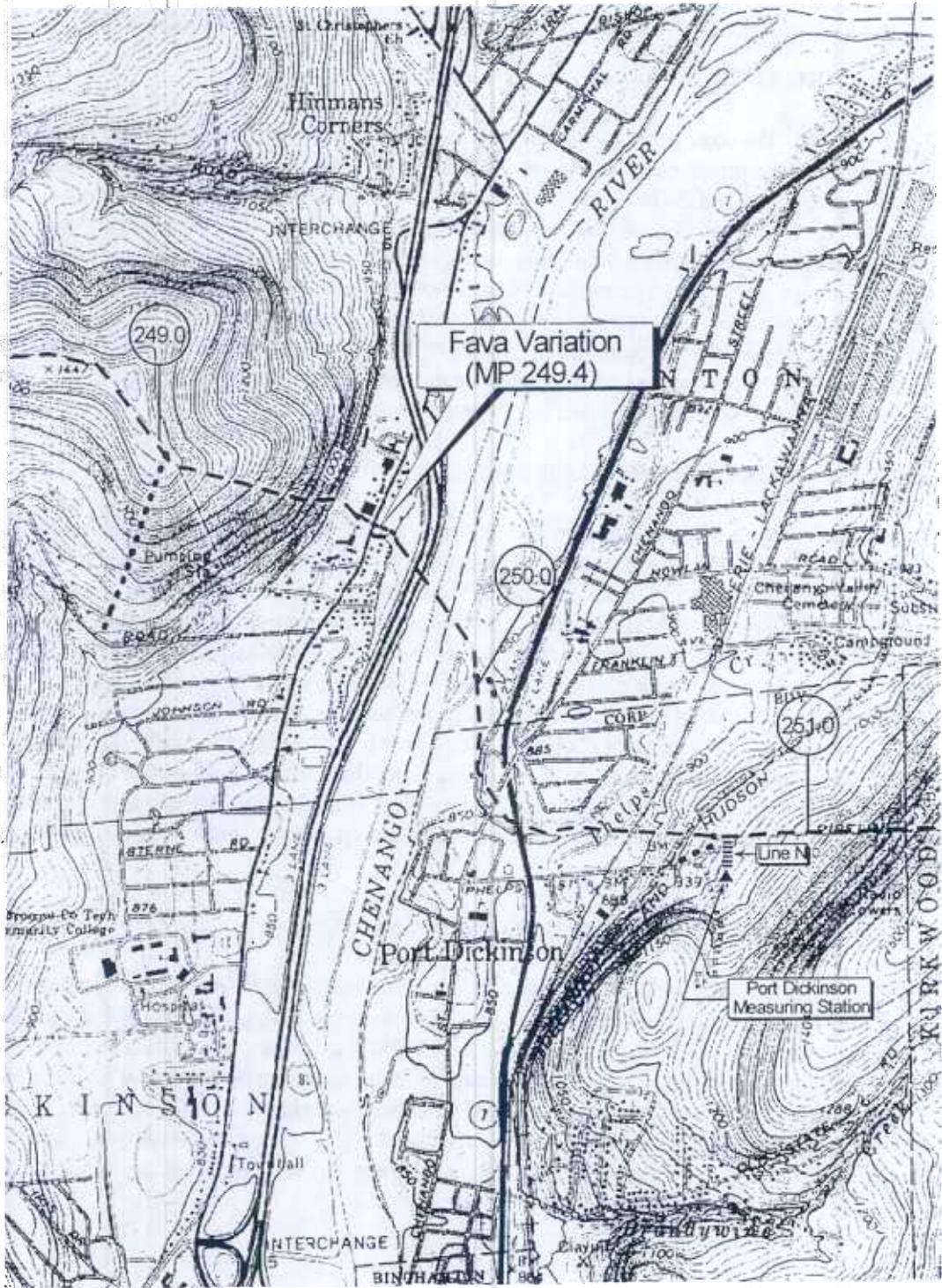
The Fava Variation was identified by Millennium during discussions with the affected landowner and would involve moving the pipeline off the corner of the Fava property at MP 249.4 (see figure 4.8-1). This property is a shopping center and the landowner was concerned about disruption of business during construction. The advantages of the Fava Variation are that it would move the pipeline outside of the northern boundary of the shopping center parking lot and avoid existing underground utilities. The Fava Variation would be 12 feet shorter than the corresponding segment of the proposed route and would require 0.02 acre less land for construction and 0.01 acre less land for permanent right-of-way. It would not affect any residences, waterbodies, or public facilities. A single emergent and shrub-scrub wetland would be affected by both routes (about 0.4 acre). Since the variation would address the landowner concerns without significant environmental impact, we concur with Millennium's proposal to incorporate the Fava Variation into its proposed route.

4.9 TRADER VARIATION (MP 314.4 to 314.5)

The Trader Variation was identified by the landowner and would involve moving the construction work area to avoid removal of a 15-foot-wide stand of mature trees (see figure 4.9-1). It would deviate from the proposed route at MP 314.4 and continue southeast until rejoining the proposed route at MP 314.5. According to Millennium, Ms. Trader's property is separated from the existing right-of-way by a stand of trees. A valve is on the existing right-of-way, and would not be replaced. The variation would involve moving the pipeline about 10 feet north of its current location for about 0.1 mile and decreasing the amount of work space in this area to about 0.2 acre of land. The variation would also increase the distance between the proposed pipeline and the residences. No wetlands, waterbodies, or public facilities would be affected by the Trader Variation. One new landowner would be affected, and has agreed to the variation. Since there are no significant environmental impacts and the variation would avoid removal of the trees that provide a visual barrier between the residences and the existing right-of-way, we concur with Millennium's proposal to incorporate the Trader Variation into the proposed route.

4.10 MISSION LAND ROAD VARIATION (MPs 351.6 to 352.4)

The Mission Land Road Variation was identified by Millennium to address design and engineering issues associated with the 90 degree angle crossings of Mission Land Road and the approach to the Pochuck River (see figure 4.10-1). The variation would begin at approximate MP 351.6 at Mission Land Road and would turn east, then southeast, and then east again to rejoin the proposed route at approximate MP 352.4 on the west side of Pochuck Creek. Both routes would be approximately the same length and impacts would be similar in that neither route would be in farmed black dirt areas. Since we identified no significant environmental impact with the Mission Land Road Variation, we concur with Millennium's proposal to incorporate the Mission Land Road Variation into its proposed route.



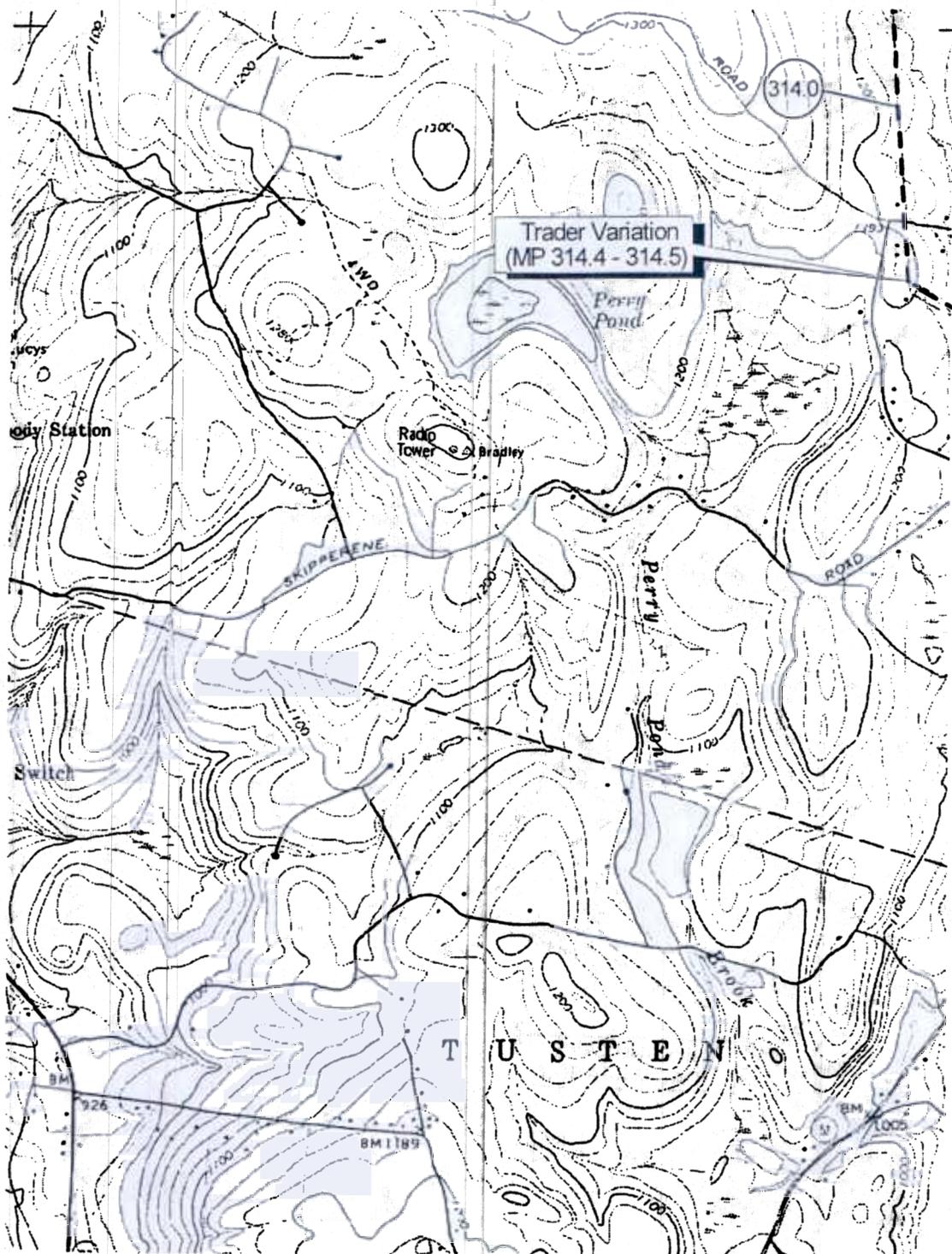
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FIGURE 4.8-1

FAVA VARIATION

SHEET 1



1000 0 1000 2000 Feet



FIGURE 4.9-1

TRADER VARIATION

SHEET 1

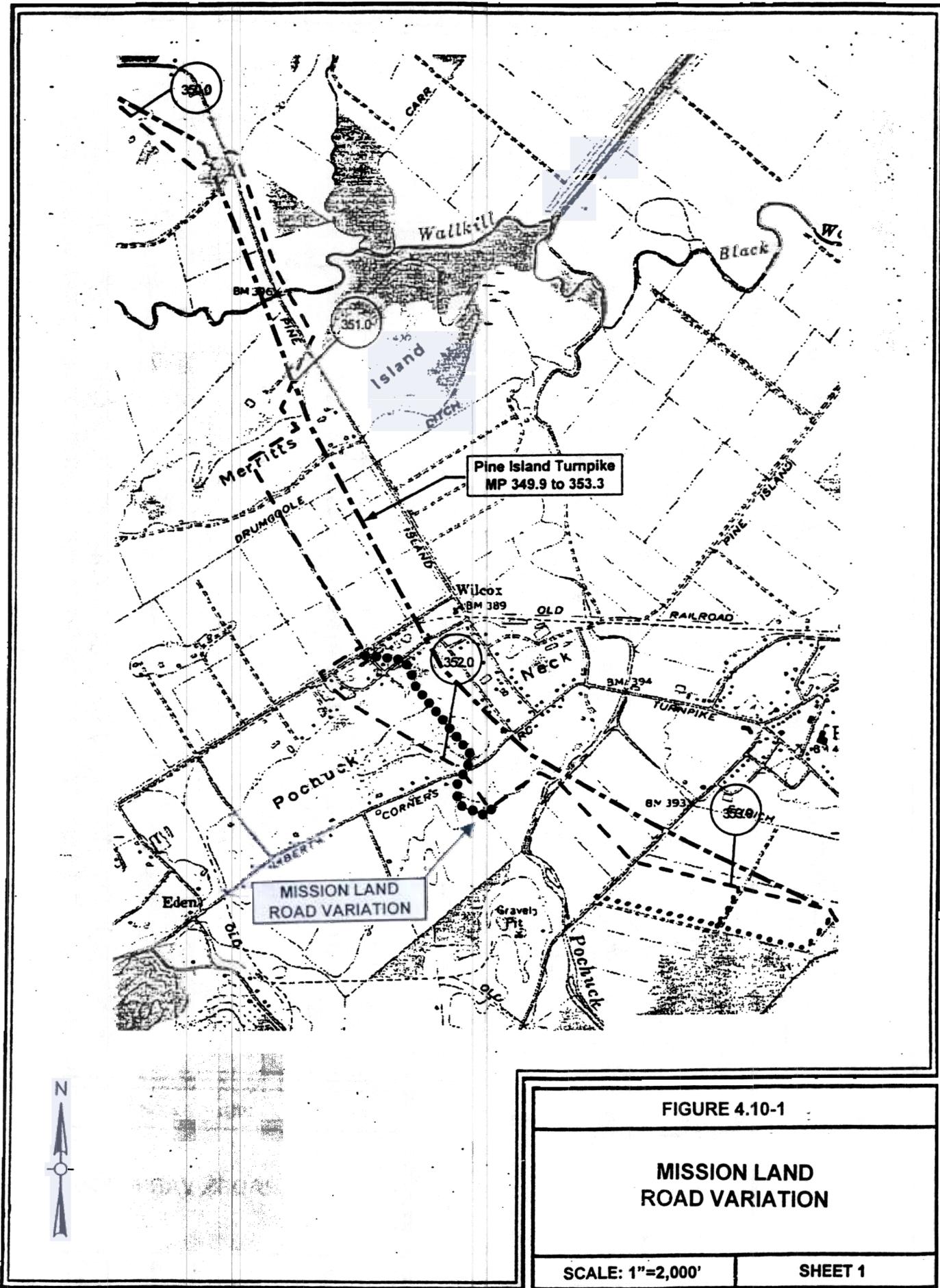


FIGURE 4.10-1

MISSION LAND ROAD VARIATION

SCALE: 1"=2,000' SHEET 1

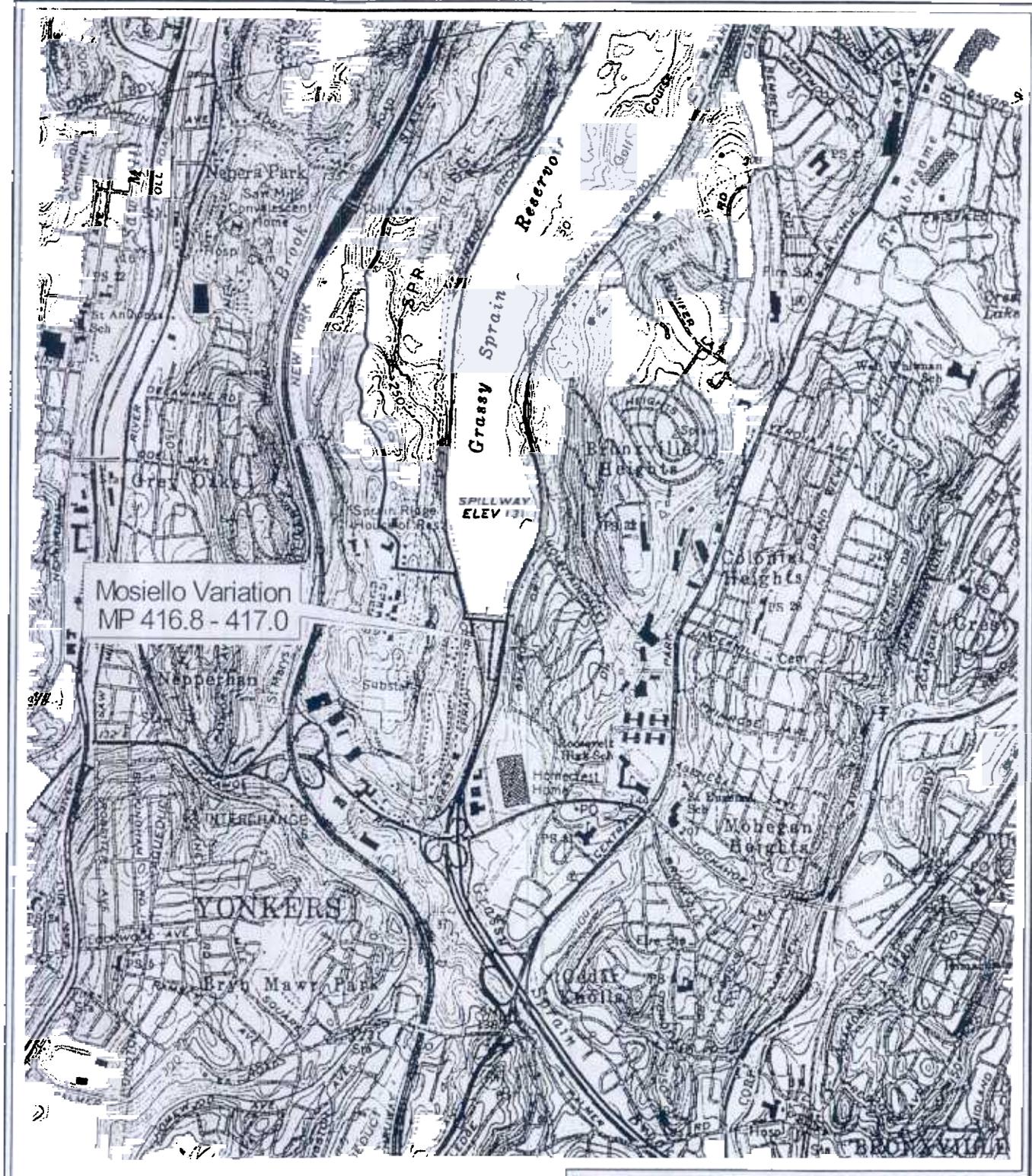
4.11 MOSIELLO VARIATION (MP 416.8 to 417.0)

The Mosiello Variation was identified by Westchester County Legislator Louis Mosiello who represents a district that borders the Sprain Brook Parkway, including a residential area just to the east of the Parkway (see figure 4.11-1). This variation was developed by the landowner and Millennium to minimize impacts on the residential area adjacent to the Sprain Brook Parkway by increasing the distance between the community and the construction work area. The Mosiello Variation would deviate from the proposed route by remaining within the Sprain Brook Parkway median for a greater distance before crossing to the east side of the Sprain Brook Parkway between MPs 416.8 and 417.0.

The variation would affect approximately 1.1 acres of forest, 0.5 acre of open land, and 0.1 acre of industrial/commercial land during construction (see table 4.11-1). The permanent right-of-way would require 0.7 acre of forest land, 0.2 acre of open land, and 0.1 acre of industrial/commercial land. The forest land would be within the area bounded by the northbound and southbound lanes of the Sprain Brook Parkway. The industrial/commercial land would consist of the bore under the northbound lanes of the Sprain Brook Parkway. The total length of the variation would be 890 feet (80 feet shorter than the corresponding segment of the proposed route). The variation would require 1.7 acres of land for construction (0.4 acre more than the corresponding segment of the proposed route) and 1.0 acre of land for the permanent right-of-way (0.1 acre less than the corresponding segment of the proposed route). No wetlands, waterbodies, federally-listed species, or additional landowners would be affected. While we note that the Mosiello Variation would increase the distance between the residences on the east side of the Sprain Brook Parkway and the proposed pipeline by about 75 feet, we have not identified any significant environmental disadvantage associated with the Mosiello Variation as compared to the proposed route. Therefore, we concur with Millennium's proposal to incorporate the Mosiello Variation into its proposed route.

| County | Mileposts/ Environmental Factor | Unit | Proposed Route | Persico Variation |
|---|------------------------------------|------|-------------------|----------------------|
| Westchester | MPs 416.8 to 417.0 | | | |
| | • Total length | ft | 970 | 890 |
| | • Estimated land requirements | | | |
| | Construction right-of-way | ac | 1.3 | 1.7 |
| | Permanent right-of-way | ac | 1.1 | 1.0 |
| • Length adjacent to existing right-of-way | mi | 0.18 | 0.16 | |
| • Residences within 50 feet of the construction work area | no | 0 | 0 | |

Note: Acreage calculations are based on a 75-foot-wide construction right-of-way and a 50-foot-wide permanent right-of-way.



Mosiello Variation
MP 416.8 - 417.0

FIGURE 4.11-1

MOSIELLO VARIATION

SHEET 1

4.12 YONKERS VARIATIONS (MPs 417.2 to 419.9)

Catskill Aqueduct Variation (MP 418.3 to 420.1)

The Catskill Aqueduct Variation was identified by NYCDEP and would deviate from the proposed route just north of the Catskill Aqueduct at MP 418.3 (see figure 4.12-1). The variation would continue southwest for approximately 0.2 miles, cross the New York State Thruway, and then continue in Bobolink and Kingston Roads for about 1 mile. The variation would then turn east in Midland Road for 0.4 mile, cross the New York State Thruway a second time, and continue roughly east-southeast for 1.1 miles along the New York State Thruway/Cross County Parkway ramps and the Cross County Parkway. The variation would rejoin the proposed route at MP 420.1. This route variation would be approximately 0.6 mile longer than the corresponding segment of the proposed route.

The NYCDEP promoted this variation as an alternative to the Catskill Aqueduct crossing proposed by Millennium. The NYCDEP stated that the variation would reduce the risk associated with the aqueduct crossing by moving the crossing to a location where the aqueduct is within a deep pressure tunnel. Such a crossing would increase the vertical distance between the aqueduct and the pipeline. While crossing the aqueduct at a deep pressure tunnel section may be preferable to the proposed crossing, the Catskill Aqueduct Variation would be within high-density residential streets. Many commenters on the DEIS, including elected officials, representatives of the City of Yonkers, and Yonkers residents, voiced a strong preference for minimizing the amount of pipeline within high-density residential areas (see section 4.13). Since construction of the variation would be counter to many of the concerns raised by the residents of the City of Yonkers, we do not recommend the Catskill Aqueduct Variation.

Parkway Variation (MPs 418.3 to 420.5)

In October, 1998, Millennium incorporated a line change in the City of Yonkers between MPs 418.3 and 420.5 as a result of consultations with the Westchester County Department of Planning. This line change placed the proposed route within Palmer Road and Desmond Avenue/Bronx River Road. At that time, the City of Yonkers commented that Millennium's proposed route would adversely affect residential areas on these roads. Specifically, the City of Yonkers identified the Sherwood House (a NRHP-listed property located about 500 feet west of the proposed route on Tuckahoe Road at approximate MP 418.3) and two residential areas of concern: the first (beginning at about MP 418.4) would be where the pipeline would be placed within Palmer Road between Central Park Avenue and the crossing of Sprain Brook Parkway; and the second (beginning at about MP 419.5) would be where the pipeline would be placed within Desmond and Midland Avenues, and Bronx River Road.

The proposed route would parallel the Sprain Brook Parkway corridor in this section (east of the parkway), crossing through the Sprain Brook Parkway interchange at the intersection with Tuckahoe Road. We believe this location provides sufficient distance (about 500 feet) between the Sherwood House and the pipeline to minimize impact on this historic property (the Sherwood House is west of the Parkway). While we evaluated use of the original proposed route (e.g., one that did not require placement of the pipeline in Palmer Road and Desmond Avenue/Bronx River Road) in the DEIS, we did not recommend it because it would require removal of existing trees and screening vegetation. In its comments on the DEIS, the City of Yonkers emphatically stated that the impact of construction and operation of the pipeline within the residential streets was of far greater concern than the loss of vegetative screening.

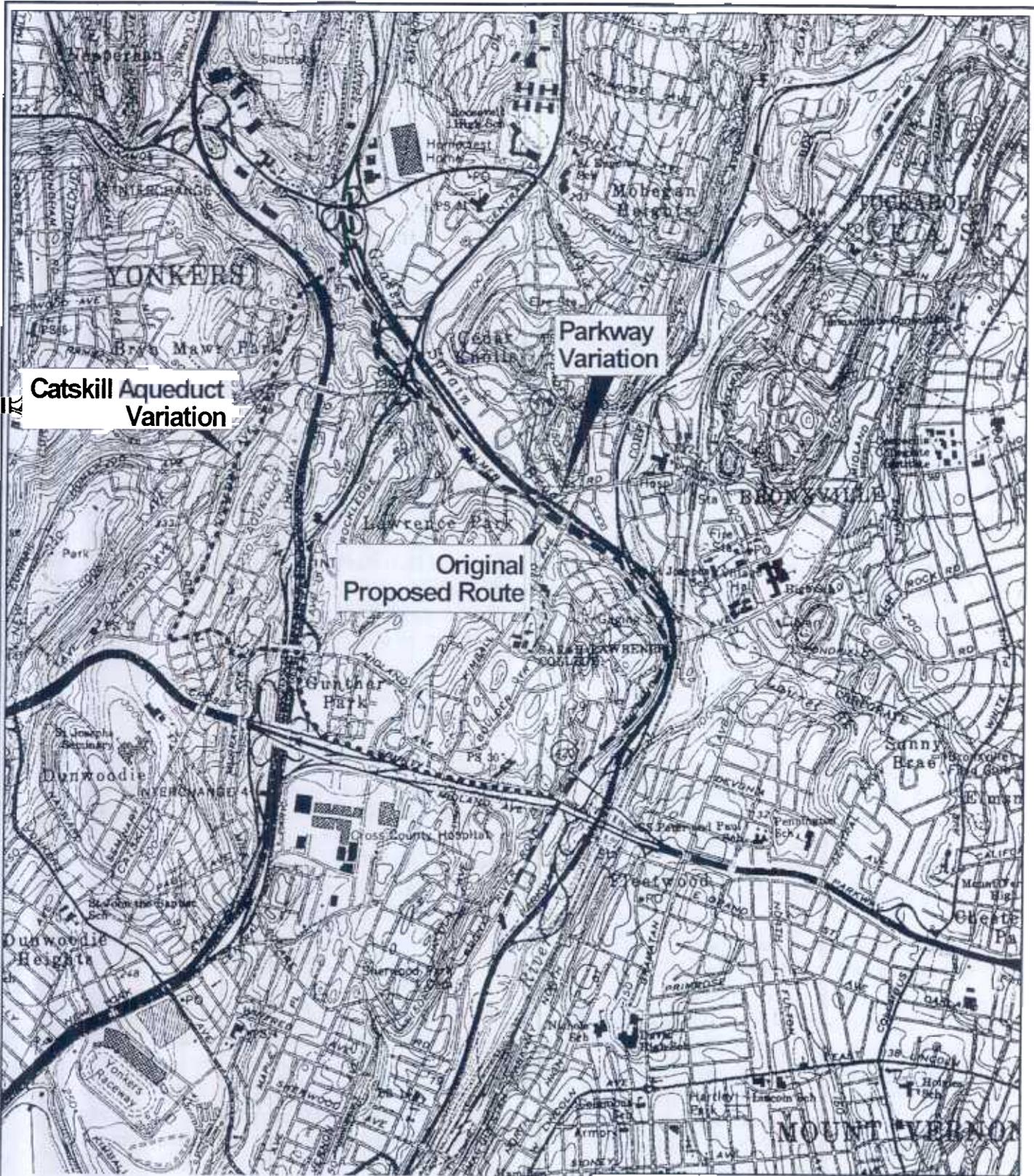


FIGURE 4.12-1

YONKERS VARIATIONS

SHEET 1

Following comments regarding an additional route alternative raised at the May 18, 1999, DEIS comment meeting in Yonkers, Millennium filed a route variation between about MPs 418.3 and 420.5 (see figure 4.12-1). The Parkway Variation would deviate from the proposed route south of the Tuckahoe Road/Sprain Brook Parkway interchange continuing south on the east side of the Sprain Brook Parkway. This variation would then enter the Sprain Brook Parkway near the northbound Tuckahoe Road on/off ramp and continue within the roadbed for about 1.9 miles to a point south of the Cross County Parkway on/off ramp with the Bronx River Parkway. After crossing under the Cross County Parkway, the Parkway Variation would leave the roadbed but continue parallel along the east edge of the roadway corridor.

South of the Cross County Parkway Reservation interchange at about MP 420.4, the Parkway Variation would enter the Bronx River Reservation, turn east across the Bronx River, and then south through the park to the intersection with the proposed route at about MP 420.9. Millennium states that construction along the Parkway Variation would take approximately 6 weeks, completing about 200 feet per crew per day within the roadway.

The Parkway Variation would place the majority of the construction within the existing road corridor, eliminating impacts to residential and commercial areas located on Palmer, Dewitt, Midland, and Bronx River Roads along the currently proposed route. No residences or businesses would be located within 50 feet of the construction work area along the variation. In addition, comments were received regarding the potential for the proposed route to impact street trees located along Bronx River Road. Because Millennium proposes to trench in Bronx River Road and confine all construction activity to the street proper, removal of existing street trees from the sides of the road would not be required. However, use of the proposed route through Yonkers could result in root disturbance and associated damage to trees located along Bronx River Road. The Parkway Variation would avoid all construction along Bronx River Road, eliminating any potential for damage to street trees in this area.

Millennium indicated that an option on the southern end of the Parkway Variation could follow a route through the Bronx River Reservation on the east side of the Bronx River. Our review of this routing option indicates that it would require the clearing of a significant number of mature trees within the reservation. In order to reduce impacts to mature vegetation within the Bronx River Reservation, we believe that the Parkway Variation should rejoin the currently proposed route at about MP 420.5 (on the east side of the Bronx River Parkway) and continue in a southerly direction along the previously cleared eastern edge of the roadway, avoiding approximately 2,200 feet of heavily vegetated parkland.

While the Parkway Variation would minimize impacts on residences, commercial areas, and street trees, activities within the Sprain Brook Parkway and Bronx River Parkway would result in significant traffic disruptions during the construction period. Information from the New York State Department of Transportation (NYSDOT) and Westchester County indicate that the average annual daily traffic for the northbound lanes of the Sprain Brook and Bronx River Parkways is between about 39,000 and 54,000 vehicles, with peak volumes coinciding with the a.m. and p.m. commuter rush hours. Millennium states that effective mitigation measures, including construction during off-peak hours and development of a traffic control plan, would be developed with appropriate agencies and filed with the Commission prior to construction. This plan would identify appropriate detours to route traffic around active construction spreads that would require closing of portions of the affected roadways. Detours could be developed utilizing the New York State Thruway to accommodate northbound through traffic as well as use of smaller surface streets to facilitate movement of local traffic.

Because the Parkway Variation would avoid construction through the residential and commercial development along Palmer, Dewitt, Midland, and Bronx River Roads that have homes within 50 feet of the construction right-of-way, we concur with Millennium's proposal to incorporate the Parkway Variation into the proposed route.

5.1 SUMMARY OF THE STAFF'S ENVIRONMENTAL ANALYSIS FOR THOSE ISSUES ADDRESSED IN PART II OF THIS SDEIS

Part II of this SDEIS addresses some of the major issues identified in comments on the DEIS, and updates important information about the originally proposed Millennium Pipeline Project. It includes issues associated with the black dirt area in Orange County, New York; water resources (e.g. Amish land, surface waters, Lake Erie, the Hudson River, and Catskill Aqueduct); coastal zone management consistency; major route alternatives at the Hudson River; and route variations.

Black Dirt Area

A unique portion of the Hudson Hills physiographic region known as the "black dirt" area is located between MPs 350.3 and 353.3. This area is comprised of peat deposits in the Pine Island area in Warwick, Goshen, and Minisink in Orange County, New York. This area has an extremely high water table with organic deposits reaching a thickness of over 30 feet in the deepest areas before reaching a distinct substrata or parent material. A complex system of dikes, primary and secondary drainage ditches, and levees are used to drain some 17,000 acres of these soils for agricultural use, including a variety of vegetable crops. The fields drained by this system contain precise contours that drain into the drainage ditches. These soils are especially vulnerable because they have multiple-surface horizons that need to be carefully segregated, and because they are susceptible to subsidence and rapid decomposition when disturbed.

Millennium has prepared a site-specific plan for the black dirt area to address concerns identified by landowners and the NYSDA&M. The final Black Dirt Plan is the result of numerous meetings and consultations and includes a route variation to address construction issues related to the crossing of Mission Land Road and the Pochuck Creek.

Millennium would use special construction methods in the black dirt area including the push-pull (or pull-in) and the stove-pipe construction methods. Soil layers would be segregated and separated by a plastic barrier and all spoil piles would be silt-fenced and covered to reduce loss by wind erosion. No open-cut crossings of levees, dikes, or pumping systems are proposed. In addition, specialized equipment would be used to restore the construction work area to grade and Millennium would monitor the black dirt area for a period of 5 years after restoration. Additional compensation would be negotiated for areas that do not achieve approximate pre-construction annual crop yields during this period.

Amish Lands

The NYSDA&M identified an area in western Cattaraugus County between MPs 74.6 and 80.0 where the pipeline would cross several properties owned by Amish farmers. This geologic conditions in this area result in shallow springs upon which the Amish generally depend for water supplies. The NYSDA&M believes that pipeline construction may alter these natural spring drainage pathways and affect the natural water source/supply on some Amish farms.

The NYSDA&M recommended six measures to develop site-specific information and mitigation plans for construction activities on the affected Amish farms. These measures include: continued consultation to determine the need to supplement individual water supplies during construction; development of an inventory of specific water systems that would be crossed by the pipeline; development of site-specific plans for the re-establishment of water supplies; consideration of minor route variations if vulnerable water sources are identified; finalization of restoration plans following review of actual construction disturbances; and monitoring the re-established farm water source/supply locations to ensure continued yields.

In addition, Millennium is developing site-specific mitigation plans for construction across the Amish farms between MPs 74.6 and 80.0. We have recommended that Millennium file the finalized plans prior to initiation of construction.

Surface Waters

Excluding the waterbodies crossed by the 9/9A Proposal (which are addressed in Part I), the pipeline would cross a total of 476 waterbodies including 282 perennial (including Lake Erie) and 194 intermittent waterbodies. These crossings include 20 major waterbody crossings (waterbodies, including lakes and ponds, that are greater than 100 feet wide at point of crossing), 237 intermediate crossings (waterbodies greater than 10 feet wide but less than or equal to 100 feet wide at point of crossing), and 219 minor crossings (waterbodies less than or equal to 10 feet wide at point of crossing).

Millennium proposes to cross 463 waterbodies (97 percent of all waterbodies) using dry crossing techniques (e.g., directional drill, conventional bore, dry ditch or a combination of these techniques). This includes all of the intermittent streams and 269 of the 282 perennial waterbodies. Of the 13 perennial waterbodies that would be open cut, three are between 42 and 96 feet wide, eight are between 140 and 2,500 feet wide, and two are over 2,500 feet wide (Lake Erie and Hudson River). The East Branch Delaware River (512 feet) would be crossed using a combination conventional bore and open cut/diversion. We reviewed alternative construction techniques for these waterbody crossings and recommended additional mitigation at certain waterbodies to minimize environmental impact.

Millennium received its section 401 Water Quality Certificate from the PADEP for the Lake Erie crossing on March 29, 2000. Millennium also received its section 401 Water Quality Certificate from the NYSDEC on December 8, 1999. Although the COE has not yet completed its project review, we believe that the proposed crossing procedures and specified mitigation would minimize impact on waterbodies to the greatest extent practical.

Lake Erie

The pipeline would cross a total of about 32.9 miles of Lake Erie within U.S. waters and 60.4 miles within Canadian waters. Lake Erie would be crossed by directionally drilling the shoreline and using conventional underwater construction by mechanical jetting for the lake crossing. Lake Erie is classified as a coldwater fishery in Pennsylvania and a Class A (high quality) waterbody in New York. The NYSDEC has requested that construction be restricted to the period between June 1 and September 15, which is more restrictive than our Procedures (June 1 to September 30 for coldwater fisheries and June 1 to November 30 for warmwater fisheries). Millennium has requested a variance to extend the timing window to between mid April and November because of the presence of hard shale at the landfall that may increase the difficulty and duration of the directional drill.

Temporary disruption of sportfishing, commercial traffic, boating and other recreational activities would be expected to occur due to the physical disturbance, noise and turbidity resulting from water-based construction activities. However, the impacts would be minimal as most of the lake would remain open for boat transit.

Ice Scour: One of the most important concerns about open trench construction was the potential for pipeline damage from ice scour along the bottom of Lake Erie. High winds on Lake Erie can fracture and pile ice into large ridges. Ice scour occurs when the keels of these ridges drag along the lakebed. To avoid damage, a pipeline must be designed to withstand the forces from an ice scour expected once every 100 years and the pipe crown must be placed sufficiently below the scour depth to keep pipe deformations within acceptable limits. Based on analyses prepared by C-CORE and Millennium, and review of these analyses by ERDC at CRREL, the

trench depth was increased from 9.2 to 11.2 feet in the areas nearest the U.S. shore. Millennium has agreed to install its pipeline at the recommended depths.

Turbidity and Sediment Deposition: Temporary increases in suspended solids would be expected as a result of in-lake construction activities. The time that the particles remain suspended depends on their settling velocities and water turbulence. The distance of travel by the sediments from the source to the point of deposition depends on the current velocity. Millennium modeled turbidity and sediment deposition based on the CRREL recommended trench depths. Millennium's modeling indicated that a visible sediment plume (TSS > 35 mg/l) could cover a maximum area of between 8.0 and 3,701.2 acres at the surface and an area of between 8.0 and 4,761.6 acres at the bottom. Duration of the plumes at the surface ranged between 2 and 47 hours. The plume would follow construction across the lake and would not be sustained at any location. Previous studies have indicated that TSS concentrations of 1,000 mg/l would have no lethal effects on most fish species. Predicted sediment deposition ranged between 1 and 27 inches up to 4,920 feet from the trench. ERDC's review of the modeling indicated that Millennium's predicted turbidity plume is conservative.

Potential for Encountering Contaminated Sediments: To minimize the potential for sediment contamination, Millennium selected the pipeline route to avoid areas of fine recent sediment deposition and maximize the crossing of non-depositional areas (i.e., those with glacial till or coarser-grained sediment). Once the corridor was established, surficial sediment samples were collected along a grid system for the analysis of an indicator contaminant (e.g., mercury). Sediment samples revealed mercury concentrations below the Ontario sediment quality guideline for lowest effect level of 0.2 µg/g and well below the EPA bulk chemical composition guideline for polluted sediment of greater than 1 µg/g. These levels in the surficial sediments represent natural (background) concentrations of mercury. Based on the low mercury levels, the concentrations of other chemical parameters were expected also to be low, indicating that sediment quality along the route corridor would likely not be a problem. Based on the information provided by Millennium and review by ERDC, no additional sampling or analyses are needed due to increased trench depths (accounting for ice scour) because the extra material excavated would be uncontaminated.

Pipeline Repair in Lake Erie: Millennium estimates that pipeline repair in Lake Erie would require 14 days from the time of break detection to the time the pipeline would be returned to service. If there is ice cover, repair would take 21 days because of the need to mobilize an ice breaker vessel.

On March 29, 2000, Millennium received its section 401 Water Quality Certification from PADEP. We have recommended that Millennium file the finalized plan for the Lake Erie crossing, including finalized construction procedures for minimizing and monitoring dispersion of the turbidity plume and sediment deposition.

Hudson River

The pipeline would cross the Hudson River (MP 387.9), in Haverstraw Bay, between Bowline Point in Haverstraw and the Franklin Delano Roosevelt Veteran's Administration Hospital in Cortlandt, about 11.3 miles north of Nyack, New York, and the Tappan Zee Bridge. The proposed crossing would be 2.1 miles long, making directional drilling infeasible as a construction option. However, the shallow, slow-moving water and sandy bottom at the crossing location would facilitate the use of the open-cut construction method. In response to agency concerns about the use of a conventional dredging techniques, Millennium now proposes to use an open-water, lay-barge construction method. This would involve installing the pipeline continuously, storing the dredge spoil in barges, and backfilling the trench using bottom-dump barges.

Millennium modeled the extent of the visible plume and the thickness of sediment deposition for the proposed crossing method. The model results were broken down into four components: 1) dredging in shallow

water using a 6-cubic-yard closed bucket, 2) backfilling in shallow water using a 6-cubic-yard closed bucket, 3) dredging in deep water using a 22-cubic-yard closed bucket, and 4) backfilling in deep water using a bottom dump barge. The modeling predicted a visible plume (> 35 mg/l) ranging between 60 and 90 feet wide by between 35 and 460 feet long during dredging and a plume ranging between 90 and 500 feet wide by between 170 and 400 feet long during backfill. The total area affected by operation on any given day ranged between 0.06 acre and 5.23 acres depending on the operation (e.g., components 1 through 3). Periodic impacts involving about 9.18 acres would occur during backfill of the deep water component (e.g., component 4). Haverstraw Bay is estimated to average about 2.6 miles wide (13,940 feet) by 4.2 miles long (22,000 feet) for a total of about 7,040 acres. Proposed construction would affect about 1.5 percent of the bay over the duration of the crossing.

Millennium conducted sediment sampling in the Hudson River near the crossing location and found trace levels of metals and other chemical contaminants. In response to comments from the NYSDEC about the presence of PCBs near the crossing location, Millennium proposes to collect two additional sediment cores. In addition, in accordance with the NYSDEC's section 401 Water Quality Certification, Millennium would implement a Hudson River Sampling Plan that would be used during construction to monitor and adjust construction practices to minimize adverse water quality impacts to the extent possible.

Millennium proposes to cross the Hudson River over a 3-month period between July 1 and September 30. The NMFS indicated that October through December would be most appropriate for dredging activity, but later indicated that it could not support any time period for new dredging. The NYSDOS commented that dredging October through December would be most appropriate, and specifically recommended against construction between April 1 and August 31 although there was some flexibility about dredging in August. Based on documentation of use of Haverstraw Bay by significant aquatic biota during each month of the year, the NYSDEC concluded that the most appropriate time frame for construction would be May through July with some flexibility on the period in July. The NYSDEC also indicated that a 10 week period between September 1 and November 15 may be acceptable. We have concluded that a late summer to autumn period would be the least disruptive to the endangered shortnose sturgeon, EFH, and state species of concern and recommended that construction of the Hudson River/Haverstraw Bay occur between August 1 and October 31 (see BA and EFH Assessment dated January 2001).

The FWS, NMFS and NYSDOS objected to Millennium's original proposal, and expressed significant concern for potential impacts to the highly sensitive ecological resources at the proposed crossing. The crossing would be within designated EFH for seven species of fish, habitat for the endangered shortnose sturgeon, and the New York coastal zone. The NYSDOS stated that it will complete its analysis of the project to determine coastal zone consistency following publication and review of the EIS. Similarly, the NMFS would use the EIS, along with our EFH Assessment and BA (both issued January 2001) to complete its review.

We believe that compared to Millennium's original proposal, the currently proposed lay-barge dredge method would significantly reduce environmental impacts on the Hudson River and Haverstraw Bay. With the revised proposed construction method, most impacts would be temporary and construction would be completed within a 3-month construction window. We note that the NYSDEC has approved the proposed project by issuing its section 401 Water Quality Certificate. We have recommended that Millennium file the results of additional sampling cores, and all plans submitted to comply with the NYSDEC section 401 Water Quality Certificate.

Catskill Aqueduct

The pipeline would cross the Catskill Aqueduct at MP 418.2 in Yonkers, Westchester County. The NYCDEP has expressed continuing concern regarding the pipeline crossing in Yonkers. Because the top of the aqueduct is only buried about 8 feet deep in this area, the NYCDEP is concerned that a failure of the pipeline could

result in an interruption of water supplied to New York City via the Catskill Aqueduct and that Millennium had not developed a design which provided adequate protection for the aqueduct during pipeline construction and operation.

In response to concerns about the crossing of the aqueduct, Millennium met with NYCDEP officials on several occasions to discuss the issues that have been raised. As a result, Millennium has prepared a modified site-specific plan for the crossing of the aqueduct to ensure that the aqueduct would be protected in the remote event that the pipeline ruptured at the crossing location. The site-specific plan includes a steel-reinforced concrete barrier between the pipeline and the aqueduct, supporting concrete columns extending from the proposed concrete barrier to the bedrock underlying the aqueduct as an added measure of protection, installation of a heavy wall, high tensile steel pipe, and installation of a telemetry system to continuously monitor the pipeline crossing for any changes in pressure. To ensure that the NYCDEP's concerns are addressed at the crossing, we recommend that Millennium file the results of an independent engineering analysis of Millennium's site-specific crossing plan of the Catskill Aqueduct, including NYCDEP's comments, prior to construction.

Coastal Zone Management Consistency

Millennium filed with the PADEP for a consistency determination for the segment of coastal zone in Pennsylvania in August 1999. No part of the project would be on land in Pennsylvania, and the only affected area within the coastal zone would be in Lake Erie. No impacts are anticipated on cultural resources or endangered and threatened species for the Millennium project area within the designated Pennsylvania coastal zone. Millennium received its coastal zone consistency determination from the PADEP on April 6, 2000.

Millennium initiated CZMA consultation and filed a CZM consistency certification with the NYSDOS in November 1998 for the segments of pipeline within the coastal zone of New York. Millennium responded to NYSDOS comments on its filing in March 1999, and discussed various aspects of its proposed crossing of the Hudson River again with the NYSDOS in August and September 1999. On June 27, 2000, Millennium provided an updated CZM consistency certification to the NYSDOS that included the 9/9A Proposal. Millennium is also coordinating with the COE, NMFS, FWS, and NYSDEC as part of other required Federal and state permit processes. The NYSDOS has not completed its review of the project, since it requires receipt of the EIS to begin its evaluation.

Based on consultations with the NYSDOS, the Lake Erie crossing appears to be consistent with New York CZM policies. The revised construction method for the Hudson River crossing (using a closed-bucket, lay-barge dredge during a construction time window that would minimize potential impacts to a variety of federally- and state-sensitive fishery resources) represents a significant improvement over the original bottom-pull dredge construction method. While we believe that construction of the pipeline within the state-designated coastal zone may have significant, temporary impact, particularly that segment within the Hudson River, we believe that construction and operation of the pipeline would not represent a long-term impact on the coastal zone or its policies. For the 9/9A Proposal, we recommend that Millennium develop a plan in consultation with the Village of Croton-on-Hudson regarding its LWRP before construction. In addition, since the NYSDOS is responsible for determining the proposed project's consistency with New York coastal zone management policies, we also recommend that Millennium file a determination of consistency from the NYSDOS before beginning construction.

Hudson River Alternatives

We evaluated two alternative crossings of the Hudson River, one about 3.3 miles north of the proposed crossing in Haverstraw Bay at the Algonquin pipeline crossing and one about 11.3 miles south of the proposed crossing at the Tappan Zee Bridge. The NMFS indicated that, because these alternatives would be outside of

Haverstraw Bay, they would greatly reduce potential impact on the shortnose sturgeon. They would also avoid the most productive areas of the recently-designated EFH in Haverstraw Bay for seven species (red hake, Winter flounder, windowpane, bluefish, Atlantic butterfish, fluke, and Atlantic herring). Further, the NYSDOS indicated that the alternative crossings would be outside the state-designated Significant Coastal Fish and Wildlife Habitat of Haverstraw Bay and would be more likely to be consistent with the New York coastal zone management plan.

We identified two potential routes to the north alternate Hudson River crossing between approximate MP 377.9 in Ramapo (Rockland County) and MP 391.7 in Cortlandt (Westchester County). Alternative 1 would be about 4.9 miles longer than the proposed route and would require significant segments of the pipeline to be placed within Harriman State Park to avoid residential properties. Alternative 2 would be about 4.7 miles longer than the proposed route and would require significant amounts of in-street construction through existing and developing residential subdivisions. In addition, we do not believe that open cut crossing of the Hudson River could be done at the alternate location (adjacent to the Algonquin pipeline) because of the existing utility (pipeline and powerline) and industrial development on both banks of the river. Because this alternative is not likely to be feasible from a construction standpoint and would result in at least an equal environmental impact, we do not recommend further analysis of this route.

We identified one alternative route to the south of the proposed Hudson River crossing between approximate MP 382.5 in Ramapo (Rockland County) and MP 408.8 in Greenburgh (Westchester County). The Tappan Zee Bridge Alternative would be about 16.1 miles in total length, or about 9.4 miles shorter than the proposed route between MPs 382.5 and 408.8. However, this does not include construction to the Bowline Plant at MP 387.4 (4.1 miles) or to the IBM facility in Westchester County at MP 397.8 (11.0 miles). If the alternative were used and laterals to these two delivery points were required, the Tappan Zee Bridge Alternative would be about 1.4 miles longer than the proposed route. If an open-cut crossing of the Hudson River could be staged between the Memorial Park in South Nyack and Lucee Park in Tarrytown, this alternative may be feasible from a construction standpoint. However, because the Hudson River crossing is about 0.6 mile longer than the proposed crossing, construction would likely take longer and could remove these parks from recreational use for up to 6 months, or longer if complete revegetation is taken into account. The alternative would also require construction within the Palisades Interstate Parkway (a NRHP-listed property) for about 5.7 miles which may be unacceptable to the Palisades Interstate Park Commission.

We believe that construction of the Tappan Zee Alternative would be extremely difficult and would result in significant impact on the Palisades Parkway, I-287, the parks in Nyack and Tarrytown, and residential and commercial development in both Rockland and Westchester Counties. Since it would also require a significantly longer crossing of the Hudson River, we do not recommend its use.

Route Variations

We reviewed 21 route variations suggested by landowners, area residents, and others. Most of the variations were identified for specific reasons to address landowner concerns about the placement of the pipeline on their property. Others were suggested as a means to reduce environmental impact. Some were not practicable or offered no significant environmental advantage. Millennium proposes to incorporate 12 route variations into its proposed route: the Moore, Grimins, Moss Hill Road, Larison, Supa, Lewis, Micha, Fava, Trader, Mission Land, Mosiello, and Parkway Variations. We agree with this proposal.

5.2 FERC STAFF'S RECOMMENDED MITIGATION

If the Commission certifies the proposed project, we recommend that the following measures be included as specific conditions to further mitigate the environmental impact associated with the construction and operation of those portions of the proposed project that have been discussed in Part II of this SDEIS. We note that we have not included a number of other aspects of the proposed Millennium Pipeline Project and that additional mitigation measures would be included to address these aspects of the proposal.

Prior to construction, Millennium shall file with the Secretary for review and written approval by the Director of OEP, the finalized plans for construction across the Amish farms between MPs 74.6 and 80.0. (p. 2-3)

2. Millennium shall attempt to complete the open-cut crossings of Cassadaga Creek (MP 59.9), State Drainage Ditch (MP 72.9), and Catatonk Creek (MP 228.1) within 48 hours, or **prior to construction**, file with the Secretary an explanation for why more time is needed for the crossings for review and written approval of the Director of OEP. (p. 2-10)
3. Millennium shall file with the Secretary a contingency plan for the crossing of each waterbody if the directional drill (Ramapo River, MP 370.0) or conventional bore (Bemus Creek, MP 55.6; Great Valley Creek, MP 94.7; Wrights Creek, MP 95.8; Canisteo River, MP 171.5; Nanticoke Creek, MP 240.7; Wallkill River, MP 350.7; and Intermittent Ditch to Eurich Ditch - MP 353.9) is unsuccessful. This shall be a site-specific plan that includes scaled drawings identifying all areas that would be disturbed by construction. Millennium shall file this plan concurrent with its application to the COE and NYSDEC for a permit to construct using this plan. The Director of OEP must review and approve this plan in writing before construction of the alternate crossing plan. (p. 2-18)
4. Millennium shall consult with the COE and expand the site-specific crossing plan for the Genesee River (MP 137.3) to include construction and restoration mitigation measures to protect the integrity of the flood control berm. The revised plan and COE comments shall be filed with the Secretary for review and written approval by the Director of OEP **before construction**. (p. 2-18)
5. **Before construction**, Millennium shall file with the Secretary for review and written approval by the Director of OEP, the finalized plan for the Lake Erie crossing. The plan shall include: (p. 2--34)
 - a. the trench depth recommendations determined by the CRREL analysis;
 - b. the plan and manual for handling emergency repair of the pipeline in Lake Erie;
 - c. finalized construction procedures, including those for minimizing and monitoring dispersion of the turbidity plume and sediment deposition, and a description of the mitigative actions that Millennium would take if the observed turbidity plumes exceeded the predicted plumes;
 - d. specific information on the discharge rate of spoil in the lake bottom in modeled zones F, G, H, I, and J after the construction contractor and jet sled equipment have been selected;
6. Millennium **shall not begin construction** of the Lake Erie crossing until it files with the Secretary a copy of the appropriate permits from the NEB regarding construction of the Canadian portion of the project. (p. 2-35)

7. **Prior to construction**, Millennium shall file with the Secretary for review and written approval by the Director of OEP, the results of the analysis of the additional sediment cores for the Hudson River and the finalized Hudson River Sampling Plan developed to meet the NYSDEC's section 401 Water Quality Certificate. Millennium shall also file with the Secretary all correspondence with other Federal and state agencies about this analysis and plan. All monitoring data collected during construction of the Hudson River shall be filed with the Secretary at the same time it is submitted to the NYSDEC. (p. 2-44)
8. **Prior to construction**, Millennium shall file with the Secretary the results of the independent engineering assessment of its proposed crossing plan of the Catskill Aqueduct at MP 418.2 and any comments from the NYCDEP on the plan. The final Catskill Aqueduct crossing plan shall be filed with the Secretary for review and written approval of the Director of OEP. (p. 2-47)
9. **Prior to construction**, Millennium shall develop a plan in consultation with the Village of Croton-on-Hudson regarding its LWRP, to enhance the shoreline park in the vicinity of the pipeline crossing; and file the plan with the Secretary. (p. 2-49)
10. **Prior to beginning construction** of any project facilities, Millennium shall file with the Secretary a determination of consistency with the New York State Coastal Zone Management Plan. (P. 2-56)