

## 6.0 COMPARISON OF ALTERNATIVES

As stated in section 3.0, we evaluated alternatives to the proposed Millennium Pipeline Project to determine whether these alternatives would be reasonable and environmentally preferable to the proposed action. Section 3.0 describes the range of alternatives considered, as well as alternatives that were considered but eliminated from further analysis.

In this section we analyze each alternative that we believed merited further analysis and compare them to the corresponding segment of the proposed project. Where detailed surveys comparable to those provided by Millennium for the proposed route are available, these data are used. Where comparable surveys are unavailable, we base our analysis on data from USGS topographic maps, NWI maps, aerial photos where available, and limited field inspections. Based on this comparison of each alternative, we provide a recommendation of whether the alternative would be environmentally preferable to the corresponding segment of the proposed route.

### 6. 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 have a direct impact on the shortnose sturgeon. The NYSDOS has indicated that the proposed crossing may not be consistent with the state's CZM program.<sup>1/</sup> 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 4.4.1). Because of the likelihood of adverse impact on the sensitive habitats of Haverstraw Bay, we considered several routing alternatives.

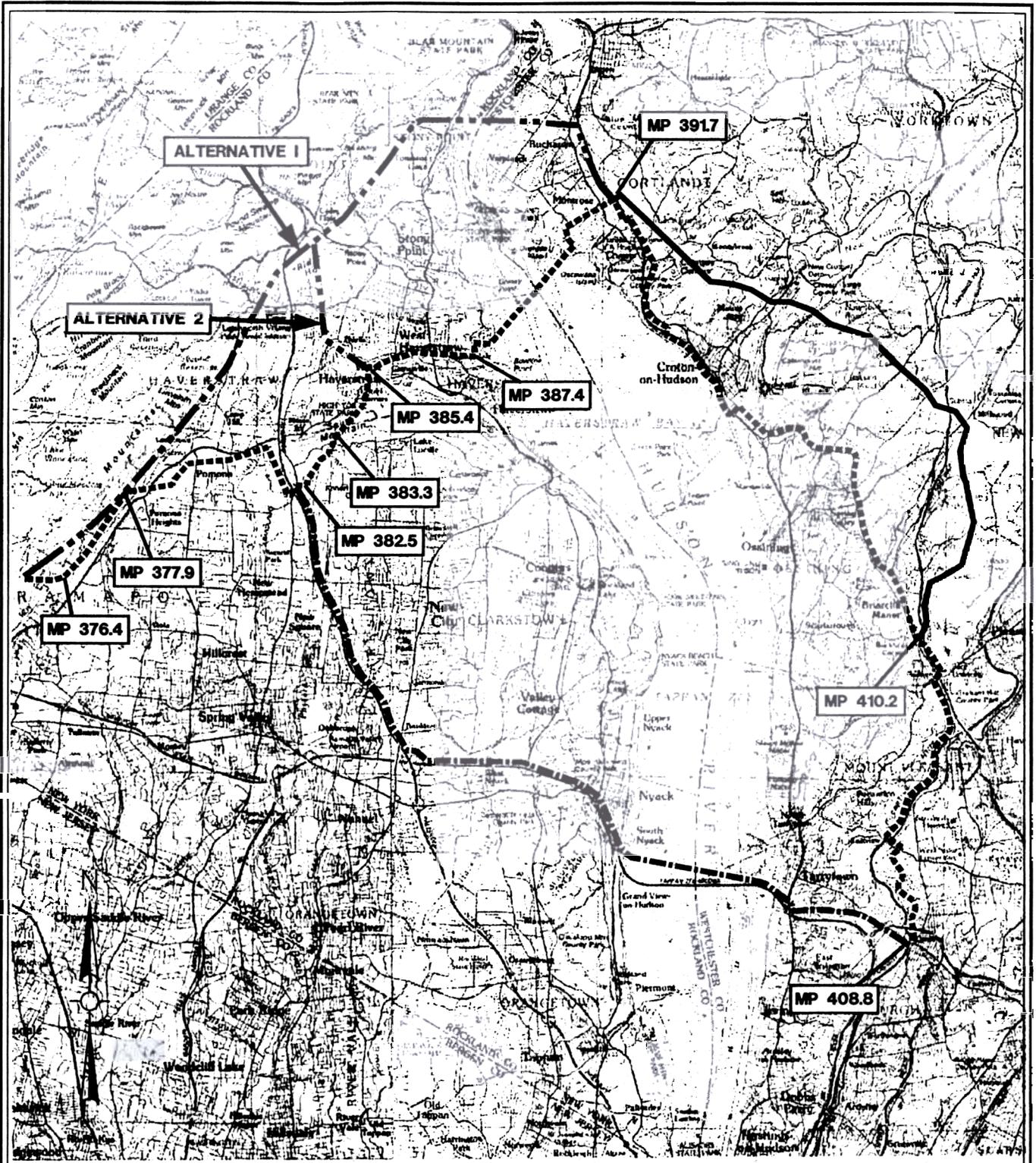
We evaluated two alternative crossings of the Hudson River, one about 3.3 miles north of the proposed crossing in Haverstraw Bay at the Algonquin pipeline crossing and one about 11.3 miles south of the proposed crossing at the Tappan Zee Bridge (figure 6.1-1). The NMFS indicated that, because these alternatives 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 CZM plan.

#### 6.1 Hudson River North Crossing/Algonquin Alternatives (MPs 377.9 to 391.7)

We identified two potential routes to the north alternative Hudson River crossing between approximate MP 377.9 in Ramapo, Rockland County, and MP 391.7 in Cortlandt, Westchester County (see figure 6.1-1). Table 6.1.1-1 compares Hudson River Alternatives 1 and 2 with the corresponding segment of the proposed route.

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<sup>1/</sup>The NYSDOS is reviewing Millennium's coastal zone consistency application and that analysis may be completed in fall 2001.



**LEGEND:**

- CURRENT PROPOSED ROUTE INCLUDES EXISTING LINE 10338 (MPs 276.4 TO 382.5), HUDSON VALLEY GAS CORPORATION APPROVED PIPELINE (MPs 382.5 TO 387.4), AND THE 9/9A PROPOSAL (MPs 391.7 TO 408.8).
- HUDSON RIVER NORTH ALTERNATIVES (MPs 377.9 TO 391.7)
- HUDSON RIVER SOUTH ALTERNATIVE (MPs 382.5 TO 408.8)
- ORIGINAL PROPOSED ROUTE (MPs 391.7 TO 410.2)



**FIGURE 6.1-1**

**HUDSON RIVER ALTERNATIVES**

SCALE: AS SHOWN

TABLE 6.1.1-1

**Comparison of the Hudson River North Alternatives  
with the Corresponding Segment of the Proposed Route**

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 <sup>a/</sup>				
	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

<sup>a/</sup> 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.

### 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 alternative 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.

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. A reroute likely would be required around the residential subdivision near Willow Grove Road since houses have been built up to both sides of the existing rights-of-way.

North of the Palisades Interstate Parkway, Alternative 1 would cross residential subdivisions between the Parkway and Cedar Pond Road, and at Bulsontown and Frank Roads. North of Frank Road, Alternative 1 would cross a Boy Scouts 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, Alternative 1 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, two tracks for an active railroad at the river edge, and possibly a water line. Because there is also a residence in this area and Algonquin aboveground facilities (pig launcher/receiver and block valves), 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 because 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 Nuclear Generating Station and the LaFarge Gypsum Plant. This area also has limited work space because of the existing industrial facilities, the steep, rock faced shoreline, Algonquin's aboveground facilities (mainline valves), 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.

Adequate work space for the staging and execution of an open cut river crossing is essential since the trench can easily be 50 feet wide at the shoreline. In addition, pipe sections for the crossing must be welded together and staged on land in preparation for pulling across the river. The most problematic engineering constraint associated with this alternative crossing location is the lack of usable work space on the west bank of the river. Although pipe could be staged on the east bank, the combination of roads, existing gas and powerline facilities, and topography render the west bank unsuitable for staging a major waterbody crossing of this kind.

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.

The most significant advantage of Alternative 1 is that it would avoid the proposed crossing through Haverstraw Bay. However, 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 6.1.1-1). 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 alternative Hudson River crossing location is likely to be infeasible because of existing utility and industrial development on

both banks and topography. Millennium stated that construction of this alternative would cost about \$6 million more than the proposed route.

Alternative 1 could not 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. An open-cut crossing of the Hudson River could not be done at the alternative location because of the existing utility (pipeline and powerline) and industrial development that confine both banks of the river and reduced available workspace. Because this alternative is not likely to be feasible from a construction standpoint and presents additional impacts to the human environment, we do not recommend further analysis of this route.

### **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 6.1-1).

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 have the same land use impacts as Alternative 1 from a point about 0.7 mile 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 the feasibility or use of this alternative.

### 6.1.2 Hudson River South/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 6.1-1). 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 or adjacent to these rights-of-way in numerous locations. An active railroad parallels the west bank of the Hudson River, but passes through 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 eastern 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 6.1-1). 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, 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 (a railroad yard) 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 long 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 long 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 long, or about 9.4 miles shorter than the proposed route between MPs 382.5 and 408.8 (see table 6.1.2-1). 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 6.1.2-1

**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
	• Laterals			
	Lateral to Bowline	mi	0.0	4.1
	Lateral to IBM	mi	4.3	11.0
	• Length adjacent to highways	mi	0.0	11.9
	• Length within roads (traffic impacts) <i>a/</i>	mi	8.8	0.8
	• NRHP listed or eligible properties crossed			
	Palisades Interstate Parkway	mi	0.0	5.7
	Old Croton Aqueduct crossing	no.	1	1
	New Croton Aqueduct crossing	no.	1	1
	• Land requirements <i>b/</i>			
	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
<i>a/</i>	Would require closing of one lane of the road during construction.			
<i>b/</i>	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. However, the maximum work space available in each park would be about 2.5 acres which would not be enough space to stage the equipment necessary for an open cut crossing of this magnitude. There is little or no additional extra space available at either park because of residential development (South Nyack) or railroad infrastructure and a marina (Tarrytown). At the proposed crossing, Millennium identified 19.8 acres for construction work space on the west side of the river and 1.0 acre on the east side of the river. 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.

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 where in-street construction would be needed. In addition, the Hudson River crossing would still be within the designated EFH and habitat for the endangered short-nose sturgeon. The longer crossing length would add to the construction time and could result in additional impacts on the Hudson River and its species. Further, in its comments on the SDEIS, the New York State Thruway Authority stated that it is initiating an environmental review process that will consider alternatives to address the structural and operational needs of the Tappan Zee Bridge and the I-287/I-87 corridor. One of the alternatives under review is replacing the existing bridge at a location near the old one. Since this alternative would require a longer crossing of the

Hudson River, would still be within designated EFH, and would simply transfer residential impacts from one area to another, we do not recommend its use.

## 6.2 ROUTE ALTERNATIVES IN WESTCHESTER COUNTY (MPs 391.9 to 404.5)

One of the most controversial portions of the Millennium Pipeline Project is the route through Westchester County. Some commenters questioned the need for the pipeline to extend through Westchester County and suggested the pipeline end at Bowline on the west side of the Hudson River. As we have stated in section 1.1, the issue of need will be determined by the Commission in the order it issues for this project and will not be addressed in the FEIS. Other commenters acknowledged the need for a new natural gas supply into the New York City area, but opposed placement of the pipeline near their residences or through their community. Finally, ConEd and the PSCNY expressed serious concerns about the placement of the pipeline anywhere near the ConEd powerline right-of-way.

When Millennium proposed the 9/9A Proposal to minimize use of the ConEd right-of-way, we received hundreds of comments protesting the use of U.S. Route 9 and State Routes 9A and 100. In response to these comments, the SDEIS suggested the ConEd Offset/State Route 100 Alternative as a compromise between the original proposal and the 9/9A Proposal. Following publication of the SDEIS, the municipalities of Briarcliff Manor, Croton-on-Hudson, and Ossining proposed a third alternative, the ConEd Offset/Taconic Parkway Alternative. The following sections provide an analysis of the issues identified by ConEd and the PSCNY about placement of the pipeline within the ConEd right-of-way, and the various proposed routes considered between MPs 391.9 and 404.5.

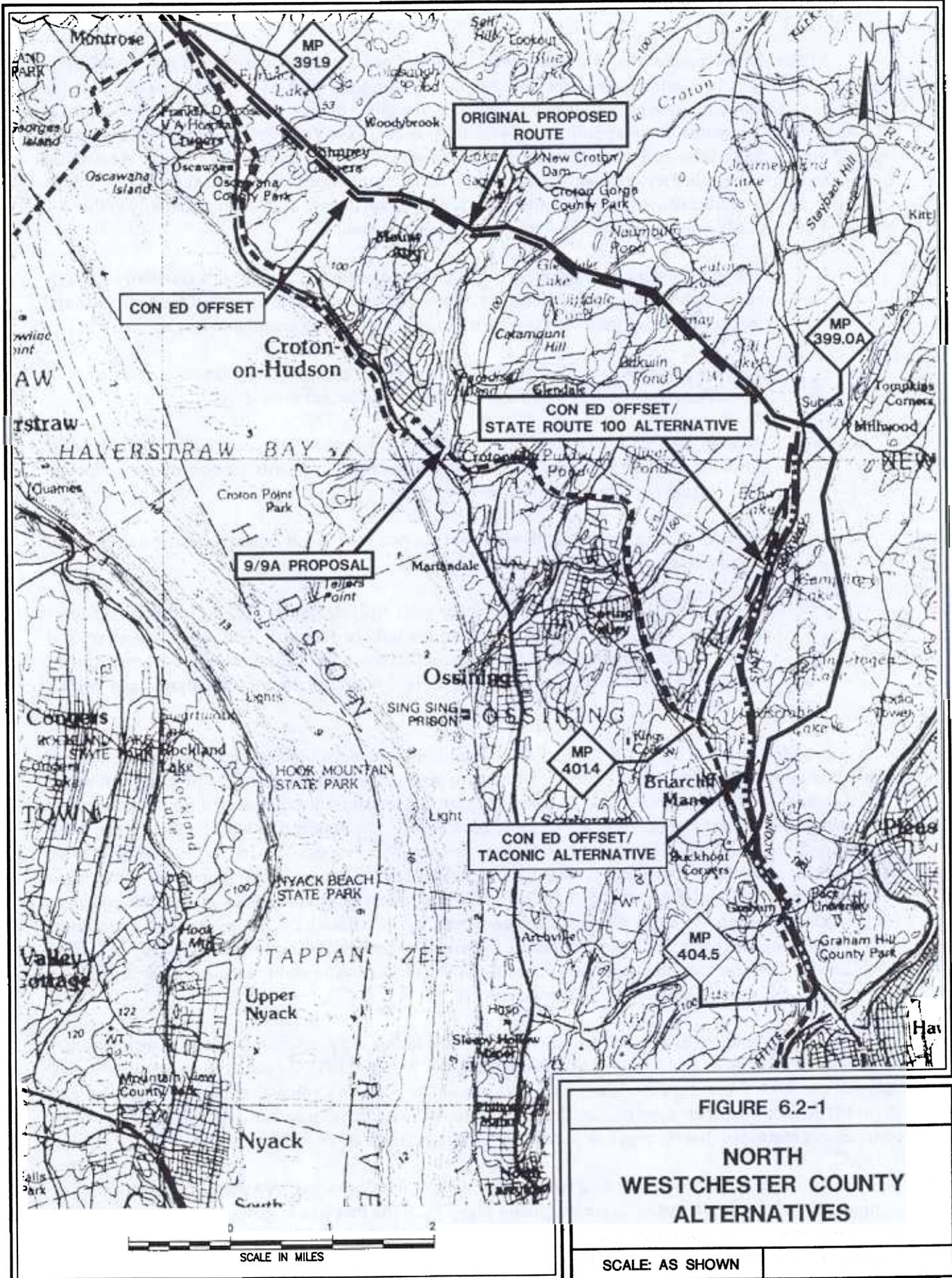
### 6.2.1 Background of the Original Route within the ConEd Electric Right-of-way

Millennium originally proposed to install its pipeline within the ConEd powerline right-of-way for about 22.7 miles between approximate MPs 391.6A<sup>2</sup> and 399.1A, MPs 399.4A and 405.1A, and MPs 408.7A and 417.7A in Westchester County (see figure 6.2-1). As proposed at that time, the pipeline would be placed 50 feet from the powerline structure centerline between MPs 391.6A and 399.1A and between powerline structures between MPs 399.4A and 417.7A. The separation between the centerlines of the two powerline structures on the existing right-of-way ranges between 80 and 175 feet. The segment between MPs 391.6A and 408.7A is within a relatively undeveloped area; the segment between MPs 408.7A and 417.7A is in a more developed commercial and residential area where deviations off the powerline right-of-way would impact adjacent development.

ConEd commented that its powerline constitutes the primary transmission facility that supplies about 40 percent of the electricity to Westchester County and New York City and that any service interruption on this portion of its electric transmission system would have catastrophic effects on New York City and the adjacent areas. ConEd cited the 1995 pipeline accident in Edison, New Jersey, and stated that it would take days or weeks to repair its electric lines along this corridor if a similar accident occurred on this right-of-way. To minimize the risk associated with such an accident and the possibility of a system blackout, ConEd stated that it would need to permanently reduce the transfer limit on this part of its system and increase the use of in-city generating stations. This change would cost ConEd and its ratepayers tens of millions of dollars annually and would not protect against localized service outages. ConEd requested consideration of alternatives that would generally move the pipeline away from the powerline right-of-way or away from the most sensitive areas of its system.

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The "A" designation indicates the MP is on the original proposed route.



**FIGURE 6.2-1**  
**NORTH WESTCHESTER COUNTY ALTERNATIVES**

SCALE: AS SHOWN

Millennium responded that it had been working with ConEd to develop proposals that would allow the pipeline to be safely constructed and operated within the powerline rights-of-way in accordance with the USDOT's safety and corrosion protection requirements. Millennium also cited the PSCNY's 1990 approval of Empire State's pipeline that was built along 115 miles of the New York Power Authority's powerline right-of-way, a major west-east component of the interconnected power system in New York. As with the Empire State pipeline, reliable mitigation systems can be designed to reflect site-specific features of ConEd's system, including number of circuits, proximity of the transmission lines to each other, resistivity of the soil, and other factors. Millennium also stated that, at a minimum, it would:

design the pipeline according to specifications developed through soils resistivity surveys, and a high voltage mitigation study that would determine the effects of fault currents and induced voltages from the powerlines and reduce them to acceptable levels;

train all personnel working in areas near powerlines about the hazards associated with powerline rights-of-way and the proper use of equipment grounding;

develop and enforce procedures regarding all aspects of construction activity near powerlines with the intent of removing all potential hazards associated with pipeline construction in powerline rights-of-way;

use non-electric detonators to eliminate the potential effect of stray electric currents and matting to prevent damage from fly rock; and

provide an electrical safety inspector for each pipeline spread working within or adjacent to powerline rights-of-way. The inspector would be responsible for electrical safety and would be knowledgeable in proper construction procedures and the dangers associated with inductive and conductive coupling, lightning, fault current, etc., on above- and below-ground structures.

In their comments on the DEIS, the PSCNY and ConEd reiterated their concern about construction within this powerline right-of-way. Both continued to protest the installation of the pipeline within the ConEd right-of-way and filed extensive comments in early 2000 against installation of the pipeline adjacent to or within the ConEd right-of-way in Westchester County. On March 6, 2000, the New York State Reliability Council (NYSRC) expressed concerns that the original route would increase the likelihood of an occurrence of an extreme contingency. The NYSRC believes that a gas explosion is an event which has a very low probability. But, if it occurred along ConEd's Westchester right-of-way, the potential consequences could be catastrophic to the electric supply for New York City. On March 21, 2000, we asked Millennium what it was doing to resolve this issue. This inquiry resulted in the identification of the 9/9A Proposal (filed in Millennium's amendment application on June 28, 2000) and the development of the April 18, 2000 MOU between the PSCNY and Millennium (see appendix G).

In response to our SNOI, we received 473 comment letters and a petition signed by more than 5,400 residents in communities that would be affected by the 9/9A Proposal. These comments almost universally opposed the 9/9A Proposal, particularly that segment of the route in Croton-On-Hudson, Ossining, and Briarcliff Manor (between approximate MPs 394.8 to 402.2) (see section 1.3.2 of this FEIS). Many commenters requested that the pipeline remain on the ConEd right-of-way.

Therefore, we initially evaluated two major route alternatives for the 9/9A Proposal for purposes of comparison. The first alternative is the originally proposed route that would generally follow the ConEd powerline right-of-way (Original Proposed Route Alternative). The second is a composite of the original proposed route (with a 100-foot offset) between MPs 391.9 (MP391.6A on the original route) and 399.0A

and a route variation suggested by the town supervisor of New Castle, New York, along State Route 100 between MPs 399.0A and 401.3 (ConEd Offset/State Route 100 Alternative). The Town of New Castle, in comments filed on the DEIS, originally suggested an alternative that starts to follow State Route 100 from Millwood, New York, to the intersection with State Route 117 south of Briarcliff Manor, New York, as a way to avoid construction near the Catskill Aqueduct and through the New York State Wildlife preserve at the Campfire Club of America. The alternative along State Route 100 would be preferable because it would place the pipeline in an area that is more commercial and industrial and less residential than a route along the ConEd corridor. Then, after publication of the SDEIS, a third alternative was identified that would parallel the Taconic Parkway instead State Route 100 (ConEd Offset/Taconic Parkway Alternative). The SMOU between Millennium and the PSCNY addressed this alternative. These three alternatives are described in sections 6.2.4, 6.2.5, and 6.2.6, respectively, and shown on figure 6.2-1.

Because of the issues raised by ConEd, the PSCNY, and the NYSRC associated with use of the ConEd right-of-way, we asked the FERC electrical engineering staff to review the feasibility and electrical engineering compatibility of the Original Proposed Route Alternative, and the ConEd Offset/State Route 100 Alternative and ConEd Offset/Taconic Parkway Alternative (ConEd Offset Alternatives) (see section 6.2.2).

### **6.2.2 Analysis of the Issues Associated With Use of the ConEd Right-of-Way**

For purposes of this analysis, we grouped the issues presented by ConEd, the PSCNY, and Millennium into eleven topics as discussed below.

#### Co-location of Gas Pipeline and Electric Transmission Lines as Originally Proposed

ConEd and the PSCNY state that proposed construction within the ConEd right-of-way is not safe. The expert testimony provided by PSCNY in the form of affidavits focuses on the dire consequences of a transmission line failure that could happen during and after pipeline construction. Millennium claims that many of these safety concerns, related to rock blasting, trench excavating, and construction equipment maneuvering, can be mitigated by the state of the art techniques, and that a gas pipeline explosion has a very small probability of occurrence. To support its argument, Millennium identified several companies that have natural gas pipelines crossing its system (Iroquois, Algonquin, and Tennessee). ConEd acknowledges that each of these three existing pipelines cross its system only once and that they do not parallel its right-of-way.

We find the arguments presented by the PSCNY concerning the potential damage to ConEd's transmission facilities during the construction phase of the Millennium pipeline's original route to be compelling, and their concerns appear to be valid. For example, the PSCNY documented its concern that because Millennium's construction plan underestimated the amount of rock in the area to be excavated, Millennium significantly understated both the amount of blasting needed to prepare the surface for the pipeline and the danger to ConEd's 345 kilovolts (kV) transmission facilities. Millennium did not dispute the PSCNY's concern about this apparent flaw in its construction plan. Instead, Millennium only stated that safety procedures could be put in place to address the danger raised by the PSCNY. Subsequently, Millennium filed its 9/9A Proposal, which would only require a limited amount of blasting along the ConEd right-of-way. This problem would be reduced by avoidance if the 9/9A Proposal is chosen.

Conversely, we believe that ConEd and PSCNY have overstated the potential danger to ConEd's transmission facilities during the pipeline's operational phase. We do not find compelling the ConEd and PSCNY arguments concerning potential dangers regarding the operation of the pipeline as explained below.

### PSCNY Comment that Lightning May Cause Gas Pipeline Explosion

We believe lightning can strike power lines at any voltage levels and anywhere. Extra-high voltage (EHV) lines are generally better equipped to protect the lines against lightning-induced surges than most rural distribution circuits. A direct hit by lightning can snap power lines, damage insulators, and puncture buried cables or pipelines. However, we have not seen any report of a gas pipeline explosion caused by lightning per se.<sup>3/</sup>

### PSCNY Comment that Corona Could Ignite Gas Vapor

The PSCNY claims that corona produced by the high voltage lines could cause flash over and produce an electrical short-circuit. However, corona phenomena during inclement weather, or in a polluted environment, while causing more losses on the lines, are not known to strike buried cables or pipelines. Also, gas vapor ignition by corona is not likely to occur because of two factors: (a) the below-the-threshold value of corona strength (voltage gradient) and (b) the inability of the gas vapor to form around the electrical conductors for any appreciable time due to the presence of wind and its buoyancy. In any event, Millennium proposes that the pipeline be equipped/designed with safety measures to prevent gas leaks and shut down the system in the event of a problem.

We believe that, in actual operation, a corona may cause a transient flash over or a short-circuit via a grounded object (such as a nearby tree top), but a corona by itself would not likely result in a gas vapor ignition.

#### 4. PSCNY Comment that a Short-circuit Current Can Puncture the Gas Pipeline

ConEd explains that a short-circuit current can reach some 63,000 amps. The PSCNY claims that a short-circuit can be attracted by the metal pipe buried nearby on the right-of-way, causing a devastating gas explosion. The PSCNY also claims that an analysis has shown that a short-circuit current can puncture a buried metal pipe. However, PSCNY did not provide a copy of the engineering analysis for us to fully understand its position on the matter of the ground current phenomenon.

Our understanding is that most of the ground-current resulting from a short-circuit travels on the ground wires (or sky wires), and only a small portion (depending on the soil resistivity) travels underground. Furthermore, if the pipeline is not located directly under the electric transmission lines, it does not "attract" ground-current. It is a well known phenomenon, in power engineering, that the ground-current follows the path of its transmission circuit and does not deviate from it. A pipeline, buried between two transmission tower rights-of-way and not directly under the lines, is not likely to receive any ground-current. Moreover, we have reviewed a recent USDOT report<sup>4/</sup> on existing pipelines sited near transmission lines that were observed to have been punctured following a lightning strike. We believe that a lightning strike had definitely broken an electric wire and caused an electrical short-circuit. Until we have a proof to the contrary, we believe that it was the lightning or a direct contact with a fallen live wire (but not a ground-current) that had punctured the pipe. While a broken electric wire in the distribution system (low voltage) may remain live for a time before the re-closure mechanism is locked out, an EHV line, when faulted or open, will be tripped out in just a fraction of a second.

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Attachment C to USDOT's Report on "Accident/Incident Records Related to Lightning Strikes, Fault Currents, Stray Currents, Induced AC (1984 - 1999)."

Attachment C to USDOT's Report on "Accident/Incident Records Related to Lightning Strikes, Fault Currents, Stray Currents, Induced AC (1984 - 1999)."

## 5. Feasibility of Constructing the Pipeline between the Electric Lines

If construction activities and physical safety measures can be resolved, the originally proposed pipeline construction between electric towers along the ConEd right-of-way is feasible. In its November 7, 2000, data response, ConEd states that for construction of its pipeline replacement project where it plans to install a pipeline adjacent to its electric transmission towers, it has safety procedures it will use to protect the electric lines from damage. It states that any blasting required in connection with the project will be done in accordance with procedures such as those identified in its Blasting Requirements. We note that Title 29 CFR Section 1926.550 requires 20 feet of minimum clearance between 345 kV electric lines and any part of a crane or "load." In addition, when equipment is in transit with no load or the boom is lowered, the equipment's minimum clearance must be 10 feet from 345 kV lines. These regulations also require a person to be designated to observe the clearance of equipment for all operations where it is difficult for the operator of the equipment to maintain the desired clearances. Compliance with the requirements of Section 1926.550 would be used to safely conduct construction activities near all powerlines along the project. Any pipeline alignment that minimizes the length of pipe that is installed immediately beneath electric lines would avoid or reduce risk during construction (e.g., the ConEd Offset Alternatives versus the Original Proposed Route Alternative).

We believe the dangers that ConEd and the PSCNY staff claim will be caused by electric phenomena, such as short-circuit and corona flash over, are not likely to occur in the postconstruction period. Furthermore, we believe that when a pipeline is located between the rights-of-way of electric transmission towers, this pipeline would be much better protected from direct lightning strikes because the transmission towers and conductors would then act as a good shield for any installation along the right-of-way.

Electromagnetic induction of EHV lines on surrounding structures has been well studied and can be resolved through proper shielding and grounding. Pipe corrosion can be prevented by the use of cathodic protection. Construction activities can be carried out at a prescribed safe distance from the transmission towers and lines. Scheduling construction during an appropriate low-load period would also help eliminate or reduce the risk of a widespread disruption of service should an electrical outage occur. Typically, such low-load periods are in the spring and fall seasons, weekends and holidays, and week nights between the hours of 11:00 pm and 7:00 am.

## 6. Concerns about the Pipeline Crossings or Paralleling of the ConEd Right-of-Way

ConEd's concerns with regard to Millennium's original route focus on the potential physical damage to its EHV structure and heavy power-carrying lines during the construction phase, and the danger of gas explosion during the pipeline's operational phase. The PSCNY, which prefers to have the pipelines located as far away as 1,500 feet from the ConEd right-of-way, states that it has no objection to Millennium's 9/9A Proposal, although it recognizes that this route alleviates but does not eliminate ConEd's concerns. However, the 9/9A Proposal alignment would cross the ConEd right-of-way at five locations (MPs 402.7, 405.5, 406.9, 409.7, and 416.6) and would be parallel to, and in some places less than 100 feet from, its right-of-way between MPs 402.7 and 405.4 for about 2.7 miles.

We believe that the risk of physical damage to ConEd's lines and transmission towers during the construction phase would not be eliminated with either the Original Proposed Route Alternative, ConEd Offset Alternatives, or the 9/9A Proposal. However, we believe that the risk of gas pipeline explosion, or other damage due to electrical mishaps, after the pipeline has been buried and is operated in accordance with all applicable safety measures, will be much reduced and perhaps eliminated altogether. However, the 9/9A Proposal alignment significantly reduces – by about 20 miles – the amount of pipeline constructed along the ConEd right-of-way (2.7 miles versus 22.7 miles along the Original Proposed Route Alternative).

We believe that carefully designed construction procedures are needed for the 2.7-mile-long stretch of the 9/9A Proposal where it would parallel the electric right-of-way (MPs 402.7 to 405.4). The PSCNY has included such construction procedures for this section of the 9/9A Proposal in the MOU it developed with Millennium. Further, we believe that similar careful procedures could be used for construction between MPs 391.9 (MP391.6A) and 399.0A of the ConEd Offset Alternatives.

7 ConEd Offset Alternatives (e.g. installation of the pipeline about 100 feet from the transmission line towers)

ConEd believes that placing Millennium's pipeline at a distance of 100 feet from the center of the outer transmission tower would not abate its proximity concerns as far as rock blasting during construction or eliminate the potential for the gas pipeline to explode during the operational phase. We believe that the ConEd Offset Alternatives have merit in that construction activities (such as maneuvering construction cranes or blasting rock) would be easier to carry out along the ConEd Offset Alternatives than the originally proposed route. For example, locating a pipeline adjacent to rather than beneath or between EHV lines has obvious benefits because it reduces clearance concerns during the construction and operational phases of the pipeline project. Careful use of blasting charges and use of blast mats can effectively control fly rock. Use of the rocsaw trencher in lieu of blasting may be feasible to avoid blasting in some areas.

Due to the nature of the alternating current (AC) and depending on the geometry of the powerline phases configuration, electromagnetic strength measured at the ground level between the rights-of-way of power transmission towers can be less than the one measured at the immediate outer vicinity of the right-of-way. However, the magnitude of the electric and the magnetic fields inside the right-of-way or along the corridor immediately adjacent to the right-of-way does not present an extraordinary risk to a normally well protected pipeline. Therefore, as far as electromagnetic compatibility and short-circuit current flow are concerned, the Original Proposed Route Alternative, 9/9A Proposal, and ConEd Offset Alternatives present little advantage of one over the other.

Clearly, the ConEd Offset Alternatives present less exposure to causing the physical risks during the construction phase, when compared to the original route (Original Proposed Route Alternative). These risks nonetheless can be real. Millennium should meet ConEd's electric and physical safety standards during the construction, and after the pipeline has been placed in the ground. In particular, the use of matting to prevent damage from fly-rock and state-of-the-art rock-blasting techniques may be more effective since the ConEd Offset Alternatives would be on one side of the right-of-way and 100 feet from the tower centerline. Furthermore, precautionary measures and safety features described in the MOU and SMOU between the PSCNY and Millennium would further enhance the operational safety of the proposed pipeline.

8. ConEd's Westchester County Right-of-Way Power Flow

ConEd claims that the six, 345 kV circuits located on its right-of-way in Westchester County carry about 40 percent of the power required by the New York City load. We reviewed ConEd's 1999 Summer Peak load-flow case (submitted to FERC Staff in conjunction with Docket No. EL99-58-000), and we find ConEd's claim to be reasonable. The load flow case shows a MW flow equivalent to 42 percent of the New York City load flowing north to south over the 345 kV circuits in Westchester County right-of-way. We also reviewed testimony filed by Charles P. Rusowicz of ConEd in Docket No. OA96-138-000, and it shows a slightly higher percentage (about 45 percent).

During the course of a hearing in Docket No. EL99-58-000 (Village of Freeport v. ConEd), the ConEd witness stated that, in view of the sensitivity of the Westchester County right-of-way to the reliability of power supply to a city of nearly 8 million people, New York City has required that ConEd install generating capacity equivalent to 80 percent of its load south of the Westchester County right-of-way. By

doing so, New York City hopes to reduce the impact of loss of the Westchester County right-of-way 345 kV lines to a manageable proportion should a complete outage of the Westchester County right-of-way occur. For example, when the New York City load is 10,000 MW, ConEd needs 4,000 MW from the north via the Westchester County right-of-way powerlines, about 1,000 MW from the west via ties in northern New Jersey to the Pennsylvania-New Jersey-Maryland Independent System Operation (ISO), and the remaining 5,000 MW from in-city generation. For instance, if in-city generation is limited to 5,000 MW and import capability from the west is increased to 2,000 MW, a complete loss of the Westchester County right-of-way powerlines would still leave New York City short 3,000 MW. If in-city generating capability is increased to 8,000 MW (80 percent of the city load), the impact of a complete loss of the Westchester County right-of-way powerlines could then be manageable.

The problem facing ConEd in these areas is that in-city generators cannot be run for a long period of time, because they are too expensive compared to power and energy available from sources to the north. And, the flow on the Westchester County right-of-way powerlines must be monitored and maintained below a predetermined value for system reliability purposes. Thus, an efficient operation of this energy system requires an economic and reliability based mix of in-city generation and power brought in over the Westchester County right-of-way.

9. Cost of Constructing the Original Proposed Route Using “Storm Watch” (or some other mitigation plan) for an Estimated Period of 6 Months

The New York ISO Services Tariff, on page 38 (Section 2.173), defines the “Storm Watch” as “Actual or anticipated severe weather conditions under which region-specific portions of New York State Transmission System are operated in a more conservative manner by reducing transmission transfer limits.” “Storm Watch” is a special reliability procedure for downstate New York. Under “Storm Watch,” transfer capacity from upstate to downstate New York is reduced when there is a threat of a thunderstorm in the area. As a result, the higher cost generation facilities in downstate New York may have to be substituted for lower cost imports from the north. The procedure was established after the New York City blackout in July of 1977, and is the subject of a PSCNY Order.

When “Storm Watch” is invoked by the ISO, it may result in redispatch costs that affect Location Based Marginal Prices (LBMPs) in the realtime market (this is as opposed to the day-ahead market). To the extent that redispatch costs result in a revenue shortfall in the realtime market, because the additional payments to local generators (in the south) turn out to be greater than the additional LBMP revenues and the dispatch savings from distant generators, the shortfall is funded through the Scheduling, Control and Dispatch ancillary service (Rate Schedule 1 in the ISO Tariff). Since the tariff does not permit this service to be self-provided, all customers in the New York ISO (not just ConEd) share in these costs. Thus, it is the ISO that calls “Storm Watch,” and when called, “Storm Watch's” cost impacts are absorbed all over the state, not by ConEd alone.

Since we do not have detailed data on the New York generators, nor the appropriate models to first dispatch and then redispatch the system, we cannot calculate the potential cost impact of instituting “Storm Watch” for six months when the Millennium pipeline could be constructed. In the absence of such data and tools, we can provide only an heuristic estimate as explained below.

The price differential between the upstate LBMPs and the downstate LBMPs vary anywhere between \$5 and \$40 per megawatt-hour (MWh) depending on the hour of day, the day of the week, and the season. Assuming that redispatch of the NYISO system (due to “Storm Watch”) results in a price differential variation between \$10 and \$50 per MWh and that 500 MW of downstate generation needs to be dispatched for 6 months (which would not be dispatched had no “Storm Watch” been in place), the variable cost impact of “Storm Watch” on the realtime market could be anywhere between \$20 and \$100 million. We note that

the above economic/cost information lies beyond the scope of an environmental analysis, and do not believe it is necessary to conduct any further refinement of this information in our EIS.

#### 10. Timing of Construction on the ConEd Right-of-Way

A seasonal load shape, coupled with hourly flow data for the Westchester County right-of-way powerlines, could conceivably point to a suitable period during which construction could be undertaken. In the absence of flow data, ConEd's load shape may be used as a proxy, with an understanding that electric power flows on the Westchester County right-of-way may not be directly proportional to ConEd's demand variations. Generally, ConEd's demand is very high during summer and winter months; therefore, those months may not be suitable for construction of the pipeline based solely on power supply needs.

#### ConEd's Gas Pipelines along its Electric Transmission Corridor

ConEd's Westchester electric transmission right-of-way contains three sets of towers. The first set of towers was built in 1932 and held two, 138 kV circuits. This system was replaced with two, 345 kV circuits in 1972. The second and third sets of towers were built in 1956 and 1961, and have been periodically upgraded since then. All three sets of (345 kV) towers are located on adjacent rights-of-way south of Millwood for less than 2 miles.

ConEd has indicated that the gas mains it operates near the Westchester transmission powerlines are small-diameter, low-pressure pipelines. ConEd operates two, 12-inch-diameter pipelines at MAOPs of 245 psig, and the rest of its system mains have MAOPs of 99 psig or less. ConEd reports that its gas system generally crosses and does not parallel its electric transmission lines. ConEd is in the process of replacing portions of a 70-year-old, 8-inch-diameter metal pipeline with a 12-inch-diameter high-density polyethylene pipeline. The replacement pipeline will be parallel to a portion of ConEd's electric transmission corridor between MPs 403.4 and 404.2 which is immediately south of State Route 117. This replacement pipeline is currently under construction and would have an MAOP of 99 psig.

ConEd states that the new pipeline is being constructed on a bike path adjacent to the electric transmission right-of-way rather than on it. This means that both the ConEd replacement pipeline and the proposed Millennium pipeline would be in the same corridor, if not the same location, between approximate MPs 403.4 and 404.2. This is true for the Original Proposed Route and the ConEd Offset/State Route 100 Alternatives, but not for the ConEd Offset/Taconic Parkway Alternative where the pipeline would be adjacent to the Taconic Parkway and not State Route 100 and the bike path. ConEd also indicates that transmission line sag and clearance during the construction period will not be a factor, and that blasting required in connection with the project will be done in accordance with procedures such as those set forth in attachment 1 to its November 7, 2000, response to question 3(b). Because the new pipeline will be made of polyethylene, ConEd has indicated that an electromagnetic compatibility study of induced voltages and currents has not been done.

#### Evaluation of the Alternative Routes

We have examined four alternatives in this region from an "electric" compatibility and construction standpoint: (1) the Original Proposed Route Alternative, (2) the 9/9A Proposal, (3) the ConEd Offset/State Route 100 Alternative, and the ConEd Offset/Taconic Parkway Alternative. ConEd and the PSCNY staff are opposed to the Original Proposed Route Alternative. Their arguments are based on qualitative assessments of electrical incidents that may occur during the construction of the pipeline and those that may occur during the operational phase after the pipeline construction has been completed. As we stated earlier, we find the arguments related to the construction phase of the Original Proposed Route Alternative compelling. We find the operational fears to be unfounded. In addition, from an electrical engineering

standpoint, the ConEd Offset/State Route 100 Alternative should not be rejected for the reasons previously stated.

With respect to the 9/9A Proposal, on July 27, 2000, the PSCNY indicated that the amended route reflects its negotiations with Millennium and, while not ideal, it is acceptable. ConEd is opposed to it. However, the use of the 9/9A Proposal would avoid most of ConEd's high voltage electric transmission system, and this would reduce the risk to ConEd's high voltage facilities and service over them during construction and operation of Millennium's transmission system. Again, we find that ConEd's and the PSCNY's fears of operating this system, after the pipeline has been laid in the ground, are unfounded.

ConEd is also opposed to the ConEd Offset Alternatives. In the April 2001 SMOU between the PSCNY and Millennium, the PSCNY agreed that if the pipeline was constructed and operated on the ConEd Offset/Taconic Parkway Alternative in a manner consistent with the SMOU, then it would be acceptable (see section 6.2.6). We conclude that this alternative would mitigate some concerns of the construction phase. Also, as far as electromagnetic compatibility and short-circuit current flow are concerned, the Original Proposed Route Alternative, the 9/9A Proposal, and the ConEd Offset Alternatives have very little advantage of one over the other.

### 6.2.3 Basis for Selection of Alternatives

In developing an alternative that would use a 100-foot offset along the entire originally proposed route between MPs 391.9 (MP391.6A) and 416.6 (417.7A on the original route), we included the segment between MPs 404.1 and 406.8 (2.7 miles) where the 9/9A Proposal would be along the Briarcliff-Peekskill Trailway. We evaluated the area that would be affected by a 100-foot offset from the ConEd Westchester electric right-of-way by using topographic maps, recent aerial photos, and helicopter and ground reconnaissance.

Between MPs 391.9 (391.6A) and 399.0A (the intersection of the ConEd corridor and the Taconic State Parkway near Millwood, New York), we observed that there were no structures within the area that would be directly affected by construction of the offset route and only one that appeared to be within about 50 feet of the construction right-of-way (a residence near MP 392.5A). We determined that this segment should be investigated further.

However, for the ConEd Offset Alternatives, we decided not to evaluate the following portions of the ConEd corridor for the reasons stated below and because, in developing our alternatives, we are attempting to minimize the use of the ConEd corridor. Use of an "offset" construction work space significantly reduces the risk of damage to the electric utility during construction because it would place trench excavation near only one set of towers rather than two. However, we would still like to minimize pipeline construction proximate to the electric transmission towers because a risk would still exist for damage during construction.

Analysis of an alternative route for a 100-foot offset along the original route between MPs 399.0A and 403.9A (between the ConEd Westchester right-of-way crossings of the Taconic State Parkway and State Route 117, respectively) was not considered further because of concerns expressed by the NYCDEP about the proximity of the Catskill Aqueduct (between MPs 399.7A and 401.6A) to any pipeline construction along the ConEd corridor.

2. Also, analysis of an alternative route for a 100-foot offset from the electric towers along the segment between MPs 406.9A and 415.3A (between the ConEd Westchester right-of-way crossings of Old Saw Mill River Road in Mount Pleasant, New York, and Jackson Avenue in Greenburgh, New York, respectively) was excluded because it would be more difficult

to construct because of the very steep terrain and the encroachment of development on the electric corridor.

#### **6.2.4 Original Proposed Route Alternative**

The Original Proposed Route Alternative would deviate east from MP 391.9 (MP391.6A) on the 9/9A Proposal for about 2,000 feet to the ConEd powerline right-of-way. Except for one deviation near Millwood to avoid the ConEd substation, the Original Proposed Route Alternative would be placed within the ConEd right-of-way for about 13.5 miles to MP 404.1 on the 9/9A Proposal. At that point, it would follow the same route as the 9/9A Proposal (on the Briarcliff-Peekskill Trailway bicycle path) to MP 406.8 on the 9/9A Proposal and then continue on the bicycle path for another 0.5 mile to the intersection with the ConEd right-of-way. The alternative would then be placed within the ConEd right-of-way for about 9.2 miles to MP 416.6 (MP 417.7A) on the 9/9A Proposal. The Original Proposed Route Alternative would place the pipeline within 40 to 50 feet from the centerline of the ConEd 345 kV electric transmission towers for a total distance of 22.7 miles within the ConEd Westchester right-of-way. Millennium had proposed to use much of the existing ConEd Westchester right-of-way for the construction work space for the Original Proposed Route Alternative. This means that construction activities would occur directly under the electric transmission lines.

We do not find that the use of the ConEd powerline as described for the Original Proposed Route Alternative is reasonable. FERC staff evaluated the comments and information filed by various parties on the technical problems associated with construction and operation of the project within the ConEd Westchester County right-of-way. That analysis concurs with those opinions in that construction of the pipeline between the transmission towers on this extremely sensitive corridor would pose an undue risk to the reliability of electric supplies to New York City and parts of Westchester County.

Since the terrain along the ConEd Westchester right-of-way between MPs 391.9 (MP391.6A) and 416.6 (MP 417.7A) is often very rugged with hard, crystalline or microcrystalline bedrock at the surface, it is anticipated that most of the trenching for pipeline installation would have to be accomplished by blasting open a trench. Blasting would also probably be required to create level work space along the construction right-of-way. This blasting activity would be between the towers and possibly under the transmission wires. The concern is that there may be damage to the transmission wires and towers caused by blasting, particularly by flying rock, even if precautions such as using mats and limiting the sizes of charges are used. This concern is heightened since much of the construction was originally proposed to be between the towers where there might be damage to two (or more) sets of towers and wires. In some locations the towers are only separated by 80 feet as measured from tower center lines. Since we concur that the reliability of the existing electric supply that is provided by the ConEd Westchester right-of-way is important to maintain, we do not recommend use of the Original Proposed Route Alternative. However, analysis of operation of the pipeline along this corridor shows that it would not pose a significant risk to electric reliability (see section 6.1.2).

However, we will briefly discuss some of the other environmental issues associated with the Original Proposed Route Alternative. Advantages of this alternative include that it would require no construction along road rights-of-way, cross the least number of waterbodies (14), require no construction within 50 feet of any residences or businesses, and have only 5 cultural resource sites that require additional investigation, none of which are National Historic Landmarks (see table 6.2.4-1).

TABLE 6.2.4-1

Comparison of the Original Proposed Route Alternative  
with the Corresponding Segment of the 9/9A Proposal

Milepost/ Environmental Factor	Unit	9/9A Proposal	Original Proposed Route Alternative (within the ConEd right-of-way)
<b>MPs 391.9 to 416.6</b>			
• Total length	mi.	25.4	26.3
• Total length within the ConEd right-of-way	mi.	0.0	
• Total length within 300 feet of the ConEd right-of-way	mi.	2.7	2.7
• Total length adjacent to Catskill Aqueduct	mi.	0	1.9
• Total length within highways	mi.	8.8	0.0
• Total length within bicycle paths	mi.	7.2	3.2
• Estimated land required for construction <u>a/</u>	ac.	136.2	239.1
• Estimated land required for operation <u>b/</u>	ac.	138.0	
• Estimated forest clearing	ac.	33.0	61.4
• Total waterbody crossings	no.	31	14
Less than 10 feet wide	no.	16	10
Between 11 and 50 feet wide	no.	13	
Between 50 and 100 feet wide	no.		
Over 100 feet wide	no.		2
• Total wetlands crossed	ft.	4,413	7,127
Number of wetlands	no.	13	28
• Cultural resource sites identified requiring additional investigation	no.	21	5 <u>c/</u>
• Residences within 50 feet of the construction work area	no.	4	0
• Businesses within 50 feet of the construction work area	no.	33	0
• Federally listed endangered and threatened species that potentially occur in the vicinity of the project	no.	2	0

a/ Construction acreage based on an average width of 44.2 feet for the 9/9A Proposal and 75 feet for the Original Proposed Route Alternative.

b/ Permanent acreage based on an average width of 49.8 feet for the 9/9A Proposal and 50 feet for the Original Proposed Route Alternative.

c/ Millennium did not have permission to conduct shovel testing along the powerline corridor, so this number may need modification.

NA = not available

Disadvantages of the Original Proposed Route Alternative are that it would require construction within and adjacent to the ConEd Westchester right-of-way (22.7 miles and 2.7 miles, respectively), would be the longest route (26.3 miles), would require the most land for construction (239.1 acres) and operation (159.4 acres), would require the largest amount of forest clearing (61.4 acres), would require construction across 2 major waterbodies that are over 100-foot wide (Furnace Brook and Teatown Lakes), would cross Teatown Lake Reservation (MP 396.6A), and Campfire Club property in New Castle (MP 400.9A), would affect the largest number and amount of wetlands (28 and 7,127 feet, respectively), and would require construction near the Catskill Aqueduct (1.9 miles, between MPs 399.7A and 401.6A).

Even though there are advantages for this alternative over the 9/9A Proposal because of its more remote location, they do not outweigh the risk to electric reliability that construction between the electric transmission towers would create. Because of our concern about these extremely important public utility resources (electric reliability and water supply for New York City) during construction of the Original Proposed Route Alternative, we do not recommend its use.

### **6.2.5 ConEd Offset/State Route 100 Alternative**

The ConEd Offset/State Route 100 Alternative would also begin at MP 391.9 (MP391.6A) on the 9/9A Proposal and would continue northeastward for about 2,000 feet following the original route to the ConEd powerline right-of-way near MP 392.0A. However, it would be placed adjacent to the southeast side of the ConEd right-of-way at a distance of 100 feet from the center of the electric transmission towers for about 7.0 miles to the intersection of the powerline right-of-way and Taconic State Parkway (approximate MP 399.0A). At this point, the alternative would leave the ConEd right-of-way and turn south along and outside of the west edge of the Taconic State Parkway right-of-way for about 0.5 mile, and then follow the west side (southbound) of State Route 100 for about 0.4 mile before crossing to the east and continuing along the east side (northbound) for about 1.1 miles. At that point, the alternative would continue within the North County Trail for about 1.2 miles to the intersection of State Route 100 and State Route 9A at MP 401.3 on the 9/9A Proposal. The 10.6 miles of the ConEd Offset/State Route 100 Alternative would replace about 10.1 miles of the 9/9A Proposal between MPs 391.9 and 401.3.

Where the Original Proposed Route Alternative would involve construction about 50 feet from the center line of the electric transmission towers, the ConEd Offset/State Route 100 Alternative would be installed at an offset distance of about 100 feet from the ConEd powerline structures. The 100-foot offset would be measured from the center of the ConEd electric transmission tower on the southwest side of the existing electric transmission corridor. The ConEd Offset/State Route 100 Alternative would also require construction activity adjacent to or within the Taconic State Parkway, State Route 100, and the North County Trail. This would require closure of portions of the trail for several weeks. These impacts would be similar to those described for the 9/9A Proposal where it would be installed within the bicycle paths. Construction along State Route 100 should be attempted with no or minimal lane closures.

The ConEd Offset/State Route 100 Alternative would decrease the risk to the transmission lines and towers associated with construction compared to the Original Proposed Route Alternative since this alternative would require construction at a greater distance from the towers in most instances. The ConEd Offset/State Route 100 Alternative would place the pipeline 100 feet from electric tower center lines whereas the Original Proposed Route Alternative would place the pipeline at distances that ranged from about 40 to 50 feet from tower center lines (the towers are separated from each other by distances that range from 80 to 175 feet). Also, if the pipeline was placed 100 feet from the centerline of the towers, minimal construction work space would be directly below the electric lines.

Advantages of the ConEd Offset/State Route 100 Alternative over the 9/9A Route are that it would require less construction along highways (1.5 miles), would require less construction along biking trails (1.2

miles), would not affect Van Cortlandt Manor, and would cross the Old Croton Aqueduct where it is deeply buried (MP 395.5A) rather than at a point where the Old Croton Aqueduct is at the surface (MP 397.4). It would also eliminate the need to construct within 50 feet of four residences and five businesses along the 9/9A Proposal (see table 6.2.5-1). However, it would require construction within 50 feet of two other residences.

TABLE 6.2.5-1

Comparison of the ConEd/State Route 100 Alternative  
with the Corresponding Segment of Route 9/9A

Milepost/ Environmental Factor	Unit	9/9A Proposal	ConEd Offset/ State Route 100 Alternative
<b>MPs 391.9 to 401.4</b>			
• Total length	mi.	10.2	10.6
• Total length within or adjacent to the ConEd right-of-way	mi.	0.0	7.0
• Estimated land required for construction <sup>a/</sup>	ac.	61.2	96.4
• Total waterbody crossings	no.	14	6
Less than 10 feet wide	no.	11	4
Between 11 and 50 feet wide	no.	1	0
Between 50 and 100 feet wide	no.	1	1
Over 100 feet wide	no.	1	2
• NWI wetlands crossed	no.	0	4
• Total length within or along highways	mi.	6.4	1.5
• Residences within 50 feet of the construction work area	no.	4	2 (estimated)

<sup>a/</sup> Construction acreage based on an average width of 49.5 feet for Route 9/9A and 75 feet for the ConEd Offset/State Route 100 Alternative.

Disadvantages of the ConEd Offset/State Route 100 Alternative include that it would be about 0.4 mile longer than the 9/9A Proposal; would require more land for construction (96.4 acres compared to 61.2 acres); would require more construction adjacent to the ConEd right-of-way than the corresponding segment of the 9/9A Proposal (7 miles compared to 0 miles); would require two major waterbody crossings (Furnace Brook and Teatown Lakes) that would be crossed using an open-cut; would cross or be adjacent to the Brinton Brook Sanctuary, Jane E. Lytle Memorial Arboretum, and Teatown Lake Reservation; would cross more wetlands (4 compared to 0) (see table 6.2.5-1). Further, a sewer line has been constructed beneath a portion of the bike path that would be used to install the pipeline. So, in order to use this corridor, the pipeline would have to be offset from the bike path into the adjacent wetlands. This would cause greater wetland impact.

Another disadvantage of the ConEd Offset/State Route 100 Alternative is that the terrain and geology along much of this alternative would be like that found along the Original Proposed Route Alternative. Along the ConEd corridor, the terrain is very hilly and rugged, and bedrock is usually exposed at the surface. Blasting would probably be required to construct most of the route, although there may be places where the rocsaw trencher or other mechanical means of excavating the trench may be feasible to reduce the need for blasting. Also, because the terrain is rugged, a construction right-of-way that is greater than 75 feet wide might be required for two-tone construction and rock storage. Blasting may also be needed to create these more level work areas. This could increase the land requirements for the construction right-of-way by about

33 percent along the portion of the ConEd Offset/State Route 100 Alternative that would be adjacent to the ConEd corridor.

Procedures for blasting near electric powerlines exist. ConEd provided us with its Blasting Procedures in its November 7, 2000, data response. It stated that procedures such as these are used when it conducts blasting along its rights-of-way, including the replacement project ConEd plans to complete in 2001 within the Westchester right-of-way near MPs 403.4 and 404.2. These procedures include the following general guidelines:

Any drilling boom or other construction equipment must maintain 25 feet of clearance from energized conductors.

All construction equipment must be grounded.

Blasting operations must not compromise the integrity of the rock outside the cut. If the specific rock blast/cut area has any influence on stability or bearing capacity of adjacent tower foundations, it would be of concern. Horizontal offsets, elevation differences and/or slopes should be analyzed; and at a minimum, plan and cross section drawings should be required to be studied by ConEd personnel.

Vibration velocities will be limited to 2 inches per second, as per New York State specification.

Non-electric blasting caps shall be used in the area of energized conductors.

Ongoing stray current testing shall be performed.

A ConEd safety inspector is required at owner/operator's expense during blasting operations inside ConEd right-of-way.

Millennium could use blasting similar procedures for construction of the ConEd Offset/State Route 100 Alternative, and this would mean that procedures ConEd considers safe to use would be employed by Millennium for blasting within the ConEd Westchester right-of-way.

The ConEd Offset/State Route 100 Alternative would avoid most construction within the ConEd Westchester right-of-way, although there may be some overlapping of the outside edge of the ConEd right-of-way. If the ConEd Offset/State Route 100 Alternative is used, it would extend construction adjacent to the ConEd Westchester right-of-way for 7.0 miles more (along the ConEd Offset/State Route 100 Alternative) than the entire 9/9A Proposal as proposed (2.7 miles) to a total of about 9.7 miles for the entire project. However, the length of pipeline construction adjacent or parallel to the electric corridor would be about 13 miles less than that required for the Original Proposed Route Alternative.

The ConEd Offset/State Route 100 Alternative would avoid construction within about 2.1 miles of the Route 9 right-of-way between MPs 391.8 and 394.2 and about 4.3 miles of the State Route 9A right-of-way between MPs 397.0 and 401.3. It would still require construction for about 2.4 miles within the State Route 9A/100 right-of-way between MPs 401.3 and 404.0. Since the alternative would avoid construction in the U.S. Route 9 and State Route 9A segments, it would also avoid installing the pipeline under the road surface under overpasses at 4 locations. These locations are: Watch Hill Road (MP 392.3), Warren Road (MP 393.3), Hawkes Avenue (MP 398.4), and Ryder Road (MP 399.6). Also avoided by the ConEd Offset/State Route 100 Alternative are potential ramp closures at 3 locations: on U.S. Route 9, the on ramp for State Route 9A (MP 392.8); on State Route 9A, the on and off ramps for Cedar lane (MP 397.8); and on State Route 9A, the on and off ramps for State Route 133 (MP 399.9).

Analysis of traffic along northbound U.S. Route 9 and State Route 9A and southbound State Route 9A/100 is presented in section 5.7.4. Within the U.S. Route 9 segment, traffic backups are not estimated to be significant, and there are alternative routes for motorists, including an alternative for the one proposed ramp closure (U.S. Route 9 northbound at New York and Albany Post Road, MP 392.7). Peak delay times

are estimated to range from no delay to up to a 10 minute delay at Croton Point Avenue during the 2.25-hour period following the evening rush hours. Also, because of the road configuration (which has flat curves, a full median, relatively flat shoulders, and an 8-foot-wide breakdown lane) there would be adequate space for the proposed construction activities.

Traffic backups are not estimated to be significant along the northbound State Route 9A segment since traffic volumes are the lowest of the three roadway segments examined. No traffic backups were estimated by the modeling at any time except at the signalized intersections. However, the road configuration, which is winding with no breakdown lane and the anticipated increased need for blasting are estimated to cause greater construction challenges and delays than the other two road segments. There is limited width beyond the travel lanes and the approximately 2-foot-wide paved shoulder for construction work space. Also, the road lanes are narrow with less lateral clearance along the edges. This lack of lateral clearance is known to reduce the vehicle capacity of travel lanes adjacent to construction zones, which contributes to increasing travel delays. Another difficulty with this segment of the proposed project is that there are no direct alternative routes that could act as a bypass for State Route 9A if motorists want to avoid the construction area and if backups occur. No significant impacts are expected at the five locations where open trenching would occur off the roadway at intersecting roads, although a timing restriction was suggested for the crossing of Croton Dam Road (State Route 134) in Ossining and may be used at other intersecting roads (see section 5.8.4).

The southbound section of State Route 9A/100 affected by the proposed construction has gentle curves, flat terrain, narrow shoulders with no breakdown lane and a guardrail median. Even though there is limited paved shoulder width, adjacent areas are relatively flat and free from obstructions including trees and rock outcrops compared with the segment along State Route 9A. More lateral clearance should be available after placement of construction equipment and traffic control devices than there would be along State Route 9A, but not as much as there would be along U.S. Route 9. Minimal delays of about 5 minutes are estimated for the hours following the morning rush hours. However, significant traffic backups are estimated for the evening peak traffic hours in the Town of Mount Pleasant from MP 402.5 to State Route 117 at MP 403.4 because Millennium only proposes to restrict construction activities during the morning peak traffic hours. This section of roadway has both morning and evening peaks. So, if construction was ongoing during the evening rush, then backups may cause about 25 minutes of delay for motorists. However, if construction activities were restricted during both the weekday morning (6 to 10 a.m.) and evening (3 to 7 p.m.) hours, this travel delay would not occur. Since this roadway is part of the emergency evacuation route for the Indian Point Nuclear Power Plant, having no lane closures during the evening rush hours would facilitate clearing the roadway more quickly than if construction activities were occurring during the evening peak traffic times. No direct alternative route has been identified that motorists might use to avoid the construction work area. See recommendation for additional timing restrictions for construction in section 5.8.4.

If the ConEd Offset/State Route 100 Alternative was used, then roadside construction would be reduced to the 2.4-mile-long segment adjacent to southbound State Route 9A/100. If the additional restrictions for the time during the weekday when construction could occur are used, then Millennium's workday would be reduced from 20 to 16 hours. But, effectively, the actual working time would be further reduced since Millennium would have to set up and clear away its work space and the traffic safety devices marking the work space twice a day rather than once a day. Therefore, the rate of construction along this portion of the project would be less than that estimated for a 20-hour day.

Although the ConEd Offset/State Route 100 Alternative would require disturbing about .2 miles of a bike trail, its use would minimize the use of roadways as work space.

The two major water bodies that would be crossed by this alternative, Furnace Brook and Teatown Lakes, would be crossed by open cut. This crossing method at these waterbodies was reviewed by the NYSDEC and approved in the section 401 Water Quality Certificate issued December 8, 1999.

We note that one residence appears to be within 50 feet of the construction right-of-way that would be required for the ConEd Offset/State Route 100 Alternative near MP 392.5A. The right-of-way could be narrowed for a distance of 100 feet either side of the residence to increase the separation between the house and the work space. The construction work space would remove some of the existing tree screening between this residence and other residential property owners, and the ConEd right-of-way. Millennium must offer to plant fast growing trees or shrubs within the temporary work spaces where vegetative screening was removed as recommended in section 5.8.6.

### Summary

Our analysis indicates that the 9/9A Proposal would have the most impact on the built environment (e.g., highways, residences, and businesses). These impacts include traffic disruptions on U.S. Route 9 (2.1 miles), State Route 9A (4.3 miles), and State Routes 9A and 100 (2.4 miles); temporary loss of use of segments of the bicycle paths (7.2 miles); and construction disturbance to residents and businesses that are adjacent to the construction right-of-way, particularly in Croton-On-Hudson, Ossining, and Briarcliff Manor. Also, two federally listed threatened or endangered species may be within the project area.<sup>5/</sup>

All of the alternatives and the proposed route would have significant impacts related to their construction. These impacts are different for each route because of the differences in the land use through which they traverse. However, the 9/9A Proposal would affect the least amount of land, forests, and wetlands. We recognize that pipeline construction along U.S. Route 9, State Route 9A, and State Route 9A/100 would cause inconvenience and traffic delays, and it would be noisy. Our analysis of traffic impacts indicates that traffic disruption would vary depending on the time of day and location of the construction zone (see section 5.8.4). If blasting is required, the time needed to complete construction along these roadways may be longer than estimated (3 months). Additional significant impacts on traffic are expected since traffic in both directions on the roads would be stopped during blasting.

Millennium would install the pipeline along U.S. Route 9, State Route 9A, and State Route 9A/100 in compliance with traffic control and maintenance plans that would be prepared in consultation with the NYSDOT to maintain safe and effective traffic control during construction activities. These plans would be approved by the NYSDOT before construction could begin (see section 2.3.3). We understand that the NYSDOT will have an inspector on site to make sure that pipeline construction occurs according to the NYSDOT permit and that all construction activity and equipment are cleared from the roadways during the times when construction is prohibited (NYSDOT, 2000).

The noise associated with construction equipment, the rocsaw trencher, and blasting would be annoying to many people (see section 5.11.2), as would the increased smell from equipment exhaust (see section 5.11.1). Noise levels may rise significantly and air pollution levels slightly because of construction. However, because the active construction area would move as pipeline installation progresses, the impact of noise and air pollution would move too. These impacts would be localized and should last a few days in

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The proposed crossing of the Croton River (a waterbody that is over 100-foot-wide at the crossing location) would be by a horizontal directional drill. This would reduce the impact on the federally listed threatened and endangered species that may use the river (the bald eagle and shortnose sturgeon). It should also result in no impact on the wetland and the Croton River because no excavation in the wetland or river would be needed to complete the crossing.

any one location. Similar noise and air impacts would be expected at all project locations where there is active construction, not just those where roadside construction is occurring.

Unavoidable traffic impacts are expected along U.S. Route 9, State Route 9A, and State Route 9A/100 during the construction period. We have made recommendations to further restrict construction times on weekdays to mitigate the development of traffic backups (see section 5.8.2). If the NYSDOT concurs with these recommendations, they may be incorporated into the final construction work plans. With the use of the recommended mitigation, the 9/9A Proposal would be a viable option.

The ConEd Offset/State Route 100 Alternative would require construction along about 7 more miles of the ConEd Westchester right-of-way than the 9/9A Proposal. It would eliminate construction between MPs 391.9 and 401.3 (10.1 miles) of the 9/9A Proposal, including 6.4 miles of construction which would require the use of road rights-of-way as work spaces on U.S. Route 9 and State Route 9A. We have recommended certain timing restrictions for construction along the 2.4-mile-long segment of State Route 9A/100, subject to approval of the NYSDOT. This segment of the proposed project would be replaced with about 10.6 miles of the alternative route adjacent to the ConEd Westchester right-of-way, State Route 100, and the North County Trail, as previously described. Millennium could use the construction and design procedures identified in the MOU it developed with the PSCNY for construction adjacent to ConEd's Westchester corridor between MPs 404.1 and 406.8 of the 9/9A Proposal for construction adjacent to the additional 7 miles of powerlines affected by the ConEd Offset/State Route 100 Alternative. The PSCNY revised its MOU to incorporate use of 7 miles of the ConEd corridor into an alternative we call the ConEd Offset/Taconic Parkway Alternative (see SMOU in appendix G and section 6.2.6).

### **6.2.6 ConEd Offset/Taconic Parkway Alternative**

In a March 28, 2001 letter, during the comment period for the SDEIS, the municipalities of Briarcliff Manor, Croton-on-Hudson, and Ossining, New York, suggested a modification to the ConEd Offset/State Route 100 Alternative, as identified in the SDEIS. This modification would follow the Taconic State Parkway rather than State Route 100 for its last segment. Then, during the April 9, 2001 public comment meeting on the SDEIS, the PSCNY and Millennium stated that they had supplemented their April 18, 2000 MOU to specifically address the ConEd segment of the alternative. This SMOU identified a pipeline location within the ConEd right-of-way at a 100-foot offset as measured from the nearest ConEd conductor rather than as measured from the centerline of the powerline structure as described in the SDEIS for the ConEd Offset/State Route 100 Alternative. The SMOU also included additional mitigation requirements for installation of the pipeline along this segment of the ConEd right-of-way (see appendix G).

On April 16, 2001, we asked Millennium to evaluate and to provide environmental information about this alternative and to identify landowners and abutters that would be affected by the alternative. On April 26, 2001, we notified the landowners and abutters along the ConEd Offset/Taconic Parkway Alternative about the alternative and requested comments as soon as possible or within 30 days of the notice. On May 8, 2001, Millennium filed its response to our data request which included a specific route for this alternative.

The ConEd Offset/Taconic Parkway Alternative would begin at MP 391.9 of the 9/9A Proposal (designated as Alternative MP 0.0) and would generally follow the south-southwest side of the ConEd right-of-way, offset 100 feet from the nearest electrical conductor for about 7.6 miles until the intersection of the ConEd right-of-way and the Taconic State Parkway. At that point, the alternative would turn south along the west (southbound) side of the Taconic State Parkway and would continue along the Taconic State Parkway and North County Trail for 5.7 miles. The alternative would rejoin the proposed route near MP 404.5 (Alternative MP 13.3) (see sheets 1 through 5 on figure 6.2.6-1).

On June 19, 2001, in response to concerns from abutters along the ConEd right-of-way, the PSCNY filed a letter with the Commission indicating that it would not oppose moving the offset to 100 feet from the centerline of the transmission towers (rather than from the nearest conductor) at three locations along the ConEd Offset segment of the alternative: the Westminster/Watch Hill area (Alternative MP 0.5 to 1.2), the Jane E. Lytle Arboretum/Hessian Hills area (Alternative MP 2.4 to 3.2), and between Alternative MPs 7.0 and 7.2 (see appendix G). As a result, at these locations, the construction work area would shift about 35 feet closer to the electric towers in the ConEd right-of-way. On June 26, 2001, Millennium filed alignment sheets to show this modification.

We received hundreds of comment letters on this alternative. The primary concerns were associated with: loss of trees from within the ConEd right-of-way that serve as screening between residences and the powerline right-of-way; impacts on conservation and recreation lands within the Brinton Brook Sanctuary, Jane E. Lytle Memorial Arboretum, and Teatown Lake Reservation; blasting within the ConEd right-of-way; health concerns associated with dioxins from residual herbicides used 20 years ago on the ConEd right-of-way; and the lack of a detailed environmental analysis of the alternative.

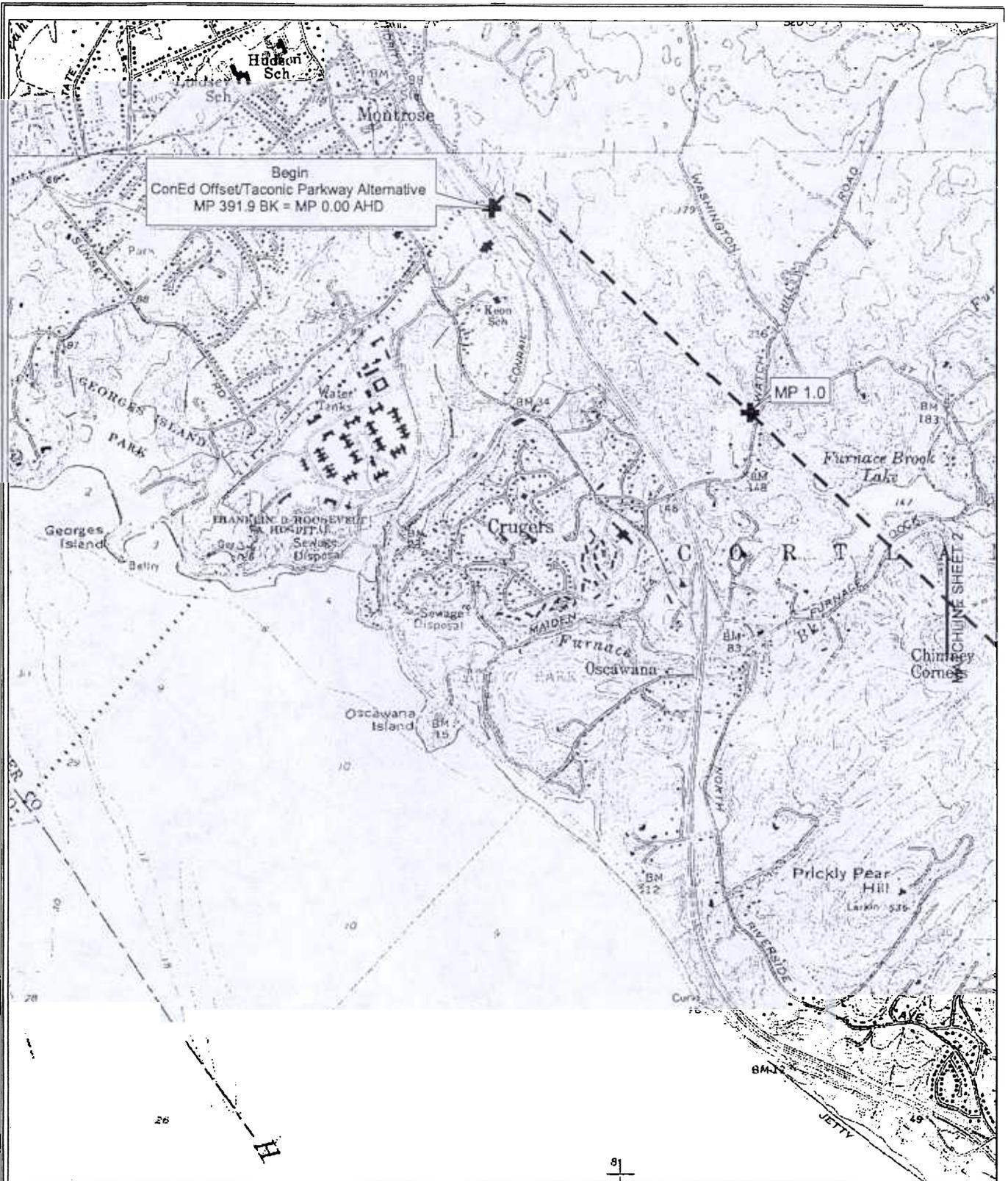
Section 6.2.6.1 provides an environmental analysis of the ConEd Offset/Taconic Parkway Alternative. Section 6.2.6.2 compares the State Route 100 and Taconic State Parkway segments of the alternative, and section 6.2.6.3 compares the alternative with the corresponding segment of the 9/9A Proposal.

#### **6.2.6.1 Environmental Analysis of the ConEd Offset/Taconic Parkway Alternative**

The ConEd Offset/Taconic Parkway Alternative would be located about 300 feet south and west of Millennium's originally proposed route along the ConEd right-of-way and between 100 feet and 2.5 miles east of the 9/9A Proposal in Westchester County, New York. Sections 4.0 and 5.0 of the FEIS provide a general description of the affected environment in this area of Westchester County and the standard mitigation measures that would be used during construction, restoration, and operation of the pipeline. That information is not repeated here, since this section focuses on the potential site-specific impacts associated with construction of the ConEd Offset/Taconic Parkway Alternative between Alternative MPs 0.0 and 13.3. These site-specific impacts include potential impacts associated with geology, water resources (groundwater, surface water, and wetlands), fisheries and wildlife, vegetation, land use (including residential and recreation areas), and cultural resources.

#### **Geology**

The ConEd Offset/Taconic Parkway Alternative is located in the Manhattan Hills of the New England Uplands physiographic province in areas where bedrock is at or near the ground surface. Blasting may be necessary to excavate the pipeline trench. However, if conditions permit, rock excavation could be accomplished by ripping or by mechanical breakdown with the use of toothed tools and bulldozers, trench excavators, and/or backhoes. Millennium states that it could use specialized equipment (e.g., a rocsaw trencher) for excavation of the ditch at selected locations along the ConEd Offset/Taconic Parkway Alternative (see appendix F). A level work area would be required for use of this specialized equipment to achieve the lateral stability needed for its operation. Therefore, Millennium would grade work area surfaces that contain soil and/or fractured rock. Grading would not be possible where hard, consolidated rock is encountered at or near the surface. In these areas, Millennium would need to blast to create both a level work area surface and the pipeline trench.



LEGEND	
	Proposed ConEd Offset/ Taconic Parkway Alternative
	Proposed Millennium Pipeline Route
	Mileposts

FIGURE 6.2.6-1	
<b>ConEd OFFSET/ TACONIC PARKWAY ALTERNATIVE</b>	
Sheet 1 of 5	





2000 0 2000 Feet

**LEGEND**

-  Proposed ConEd Offset/  
Taconic Parkway Alternative
-  Proposed Millennium  
Pipeline Route
-  Mileposts

**FIGURE 6.2.6-1**

**ConEd OFFSET/  
TACONIC PARKWAY  
ALTERNATIVE**

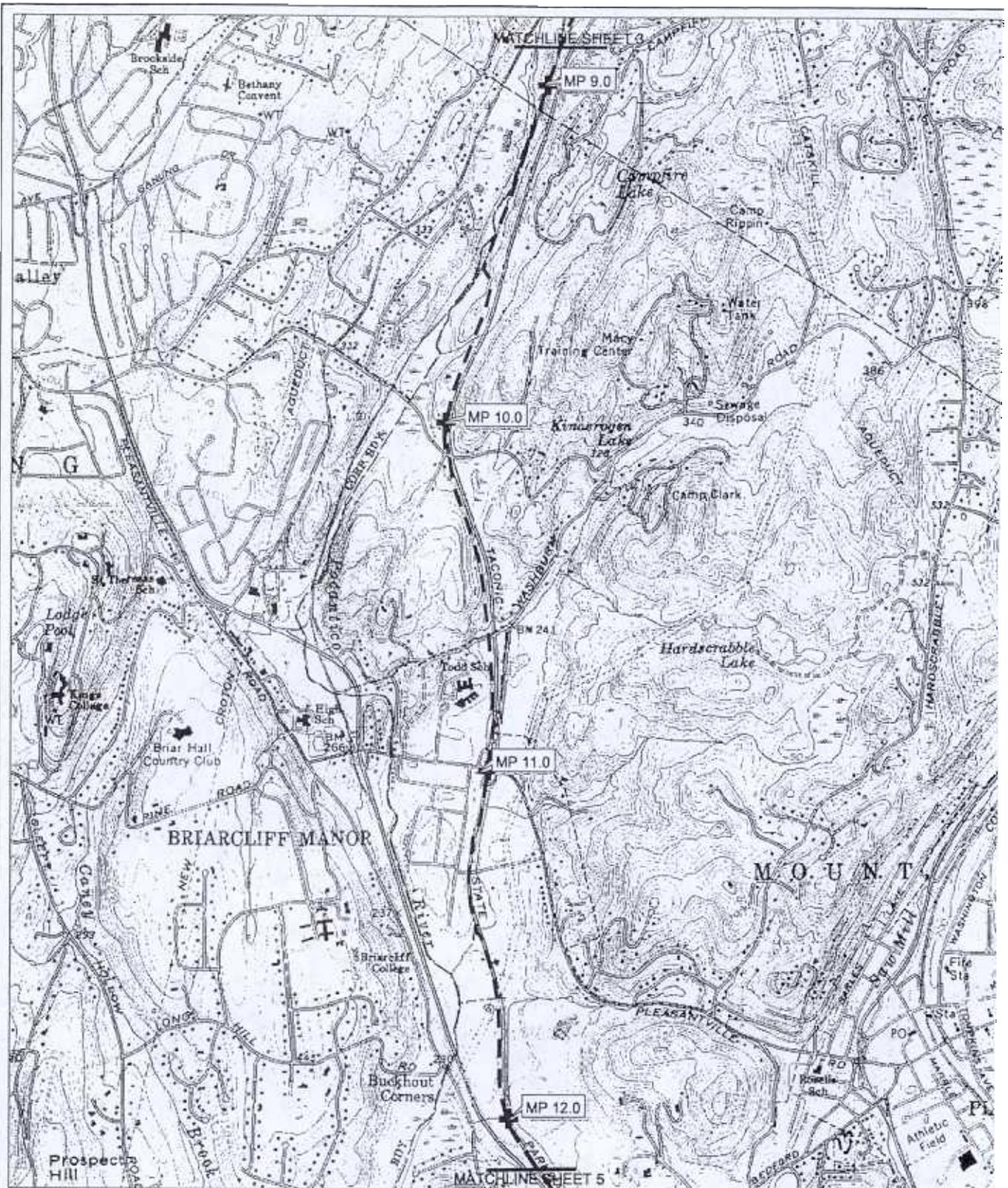
Sheet 2 of 5



2000 0 2000 Feet

LEGEND	
	Proposed ConEd Offset/ Taconic Parkway Alternative
	Proposed Millennium Pipeline Route
	Mileposts

FIGURE 6.2.6-1	
<b>ConEd OFFSET/ TACONIC PARKWAY ALTERNATIVE</b>	
Sheet 3 of 5	



2000 0 2000 Feet

**LEGEND**

- Proposed ConEd Offset/  
Taconic Parkway Alternative
- Proposed Millennium  
Pipeline Route
- Mileposts

**FIGURE 6.2.6-1**

**ConEd OFFSET/  
TACONIC PARKWAY  
ALTERNATIVE**

Sheet 4 of 5



2000 0 2000 Feet

**LEGEND**

-  Proposed ConEd Offset/  
Taconic Parkway Alternative
-  Proposed Millennium  
Pipeline Route
-  Mileposts

FIGURE 6.2.6-1

**ConEd OFFSET/  
TACONIC PARKWAY  
ALTERNATIVE**

Sheet 5 of 5

Blasting would only be used as a last resort in the event that hard microcrystalline rock is encountered and cannot be avoided. Based on a walkover of the alternative, Millennium characterized the right-of-way into three general categories: solid rock (granite or metamorphosed granite such as schist and gneiss), rock and soil (with rocks that vary in size from that of a car to that of a bowling ball and soils that are generally sandy), or rock or soil overlaying solid rock. Millennium further identified 12 locations where blasting could be required: Alternative MP 1.1 (near Watch Hill Road), MP 1.3 (Furnace Brook Road area), MP 1.6 (near Furnace Dock Lane), MP 3.4 (north of Georgia Lane), MP 3.5 (200 feet north of Batten Road), MP 4.5 (north of Quaker Bridge Road), MP 4.5 (north of an unnamed dam), MPs 5.0 to 5.3, MP 5.7 (south of Teatown Lake), MP 6.4 (north of the State Route 134 fire station), MPs 8.3 to 8.7 (from an unnamed pond to the bicycle path), and MPs 9.5 to 9.6 (from the bicycle path to the Taconic State Parkway).

The Town of Cortlandt filed extensive comments from the president of a company that solves blasting problems for the construction, mining, petroleum, and natural gas industries. These comments identified specific concerns with blasting along the ConEd right-of-way and the impacts associated with this blasting on nearby residences, septic systems, oil tanks, or other utility lines. Included in these concerns were:

- Millennium has underestimated the amount of blasting that would be required;
- rock displacement, cracking, and severe lateral rock movement can and has occurred far beyond 15, 35 or even 50 feet from blasts and can damage structures, septic systems, and oil tanks;
- flyrock (or rock ejected from the blast area) has velocities that have been measured at nearly 1,000 feet per second (the velocity of a bullet) and fractures into very sharp angular pieces that can injure people and damage property;
- fractures in the rock as a result of blasting would form laterally and horizontally from the blast area and can become a conduit for gases (including carbon monoxide and other poisonous gases) and liquids;
- there is no known way to eliminate the dust (fine micron-sized rock particles) from blasting;
- blast holes may need to be at least 9 feet deep (or 2 feet deeper than the intended grade), trench width may be as much as 8 to 10 feet wide at the top, and a much wider right-of-way than 35 feet would be needed;
- there is no rationale for safe blasting distances (150 feet is arbitrary); and
- it is essential that seismic monitoring be done once a genuine "safe" blasting distance is established.

Millennium states that in accordance with its ECS, and with the landowner's permission, it would conduct pre- and post-construction water quality testing on wells, and pre- and post-blasting inspections of structures, within 150 feet of the construction work area where blasting is required. Blasting would be performed by a licensed blasting contractor in accordance with all Federal, state, and applicable valid county and municipal construction requirements, including any requirements for blasting. Any blasting would be conducted only during daylight hours and in accordance with all existing ConEd requirements filed with the Commission on October 23 and November 7, 2000. Blasting would be conducted with minimal charges that are sized and located to merely fracture the rock, not remove it. All blasts would be covered with mats to minimize airborne material. Rock removal would be accomplished with a backhoe or other means.

Since large charges would not be used, hazards associated with rock displacement, fractures, and fly rock would be significantly reduced. This would also avoid excavating the entire trench with one blast that could result in a trench up to 10 feet wide at the top as noted by the Town of Cortlandt. We also note that Millennium proposes to use the 35-foot-wide construction right-of-way only in areas along the bicycle path

(see appendix C).<sup>6/</sup> Use of the smaller charges would also limit the potential for damage to nearby structures or the potential for damage to extend beyond structures that are near the blast.

The Town of Cortlandt also noted that it is unrealistic to assume that the rock trenching machine can work effectively in solid rock, or even some hard limestone. Millennium has acknowledged this and primarily intends to use the rock trencher along the bicycle paths that have been paved over an abandoned railroad right-of-way. The Town of Cortlandt also stated that Millennium has not used simple inexpensive geophysical methods (such as shallow refraction seismic surveys) to clearly identify locations where blasting would be necessary to excavate the trench or establish a level working surface for equipment. While such techniques may be useful in estimating the actual amount of blasting that may be required, we believe the issue is how to accomplish blasting in a manner that would avoid or minimize impacts.

While we believe that Millennium has identified appropriate measures to minimize impacts associated with blasting, we believe that more detailed specifications are needed for blasting along the ConEd Offset/Taconic Parkway Alternative and recommend that:

- **Before construction, Millennium should file with the Secretary for review and approval by the Director of OEP, a detailed blasting plan for construction along the ConEd Offset/Taconic Parkway Alternative. This plan should include at a minimum:**
  - a. **the blasting recommendations as filed by ConEd in its filings with the Commission on October 23 and November 7, 2000 and in any subsequent consultations;**
  - b. **a listing by milepost of each location that would require blasting, either for the trench or to establish a level working right-of-way, as determined by core drilling, shallow refraction seismic surveys, or other geophysical means; and**
  - c. **blasting specifications, including general provisions for storage of explosives, pre-blast operations (such as drill hole dimensions, type and size of charges, loading and firing, etc.) procedures for discharge of explosives and notification of the public, disposal of explosive materials, the maintenance of blasting records, and pre- and post-blast inspections.**

## Water Resources

### Groundwater

The ConEd Offset/Taconic Parkway Alternative would cross one NYSDEC designated primary aquifer within the Croton River valley, the Croton Primary Aquifer. This aquifer is within an area that extends from the ridge tops on the west and east side of the Croton River between Alternative MPs 2.9 and 4.4. The aquifer is within the Croton Watershed for the New York City water supply system that encompasses a total of 177 square miles and all or parts of 10 municipalities including the Town of Cortlandt and New Castle.

Table 6.2.6.1-1 lists the public and private water supply wells within 150 feet of the ConEd Offset/Taconic Parkway Alternative construction work area. Two public water supply wells that service the Village of Croton-on-Hudson are located adjacent to the Croton River and would be within Millennium's

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Blasting probably would not be required for construction along the bike paths as these are built on top of railroad berms.

proposed construction work area at Alternative MP 3.9. Based on our review of Millennium's alignment sheets, we note that one other public water supply well is located about 400 feet south of approximate Alternative MP 3.8. Millennium indicates that, presently one of the three public water supply wells is in service, while the remaining two wells are not in use but are maintained as backup water sources. Two private water supply wells (Alternative MPs 3.2 and 7.0) would be within 65 and 110 feet of the ConEd Offset/Taconic Parkway Alternative construction work area, respectively.

Construction activities along the ConEd Offset/Taconic Parkway Alternative could result in impact on groundwater resources. However, most of the potential impact would be avoided or minimized by the use of both standard and specialized construction techniques. To protect groundwater resources during pipeline construction and operation, Millennium would implement the mitigation measures described in section 5.3.1 of the FEIS. These measures include the implementation of Millennium's ECS and SPCC Plan and our Plan and Procedures.

TABLE 6.2.6.1-1  
Public and Private Wells and Springs within 150 feet of the ConEd Offset/Taconic Parkway Alternative

County	Approximate Alternative MP	Water Supply Type	Approximate Distance from Construction Work Area (ft)
Westchester	3.2	Private Well	100 <sup>a/</sup>
	3.9 (2)	Public Well	Within the construction work area
	7.0	Private Well	145 <sup>a/</sup>

<sup>a/</sup> Within the segment (MPs 2.7. to 3.2 and 7.0 to 7.2) where the pipeline would be moved 35 feet closer to the ConEd powerline. This additional 35 feet is included in the distance shown.

The Village of Croton-on-Hudson expressed concern about potential impacts to the village's well field and water supply. The village obtains its water from shallow wells in the Croton River gorge. This valley-fill aquifer is the primary source of municipal drinking water for the village and is the sole source of drinking water for the majority of the village population. The wellfield is currently pumped at about 1.5 million gallons per day. The pipeline would cross through the middle of the village's designated Zone 1 Wellhead Protection Area. The village's concerns included the potential for a decline in the water table from trench dewatering, and contamination from spills during construction and from pipeline leaks during operation.

During a meeting with the Village of Croton-on-Hudson, Millennium learned that the well logs for the village's public water supply well field show the top of bedrock in this area to be about 65 feet below the ground surface. Because of these deep soils, Millennium does not anticipate that blasting would be necessary near this public water supply well field. Millennium has agreed to a site-specific request from the village to bury its pipeline with extra cover (minimum of 8 feet) to prevent interference with possible future water lines through this area. To further protect the village's public water supply, Millennium would include the Village of Croton-on-Hudson's wellfield protection zone in its SPCC Plan. This would restrict equipment refueling within 400 feet of the protection zone, prohibit overnight parking of construction equipment within the protection zone, and require that construction and inspection vehicles be equipped with spill prevention and containment kits.

The Village of Croton-on-Hudson commented on potential impacts to the shallow groundwater aquifer contiguous with the Croton River. The comments included references to local studies that indicated

a hydraulic connection between the aquifer and the Croton River. The village also noted that the soils within the primary aquifer recharge area were very permeable. These factors would suggest that the hydraulic conductivity in the area is high. Under these conditions, rapid fluctuations of the groundwater head would be expected. That is, the highest elevation of the aquifer would probably be associated with the period in which the groundwater inputs (e.g. precipitation and lateral river flow) significantly exceed groundwater losses (e.g., evapotranspiration and anthropogenic withdrawal). We do not have data to construct a water budget for the aquifer, but it is safe to assume that the greatest groundwater losses would occur during the summer months when vegetation is at maximum leaf-out and water usage for lawn maintenance and recreation is highest. In addition, inflow from the Croton River would likely be at a minimum when river flow is at its minimum.

We reviewed a 66-year USGS flow record from a gaging station just upstream from the proposed crossing and found that flow is at a minimum in July and stays relatively low through November. We also reviewed precipitation data from Westchester County and found that precipitation levels are fairly consistent throughout the year. However, for the low flow months, September and October generally receive slightly less rainfall. For example, at Dobbs Ferry, only 5 days with precipitation totals exceeding 0.1 inch normally occur in the month of October.

Since most of the village's concerns focused on the potential that the pipeline trench would intercept and alter the hydrology of the aquifer, we suggest that construction during the period in which the aquifer elevation is lowest would substantially minimize the potential for disruption of the aquifer. Consequently, we recommend that:

- **Millennium should restrict all construction activities across the Croton Primary Aquifer on the ConEd Offset Taconic Parkway Alternative between Alternative MPs 2.9 and 4.4 to the period of September 1 through October 30.**

The Town of Cortlandt commented that construction of the pipeline could adversely affect the Croton watershed. Given the size of the watershed (177 square miles), the distance of the New Croton Dam at the southern end of the Croton Reservoir from the crossing (about 0.6 mile upstream), and the relatively shallow depth of pipeline excavation (about 6 feet deep), we do not believe there would be any significant impacts on the watershed from proposed construction activities. Further, Millennium would be required to install and maintain erosion control devices to stop the flow of sediment off of the right-of-way. In accordance with its ECS and our Plan and Procedures, Millennium would inspect erosion controls towards the end of each work day and after each storm event of 0.5 inch or greater.

Millennium met with the landowner at Alternative MP 3.2 regarding the proximity of his private water supply well to the construction work area and indicates that, according to the landowner, this is a shallow artesian well. Construction activities would take place about 100 feet up slope from this private water supply well. With the landowners' permission, Millennium would inspect the well, and the private well located at Alternative MP 7.0, before and after construction to ensure that they have not been damaged by construction activities. In addition, Millennium would not blast within 150 feet of the shallow artesian well.

### Surface Water

The ConEd Offset/Taconic Parkway Alternative would cross 17 waterbodies, comprising 11 perennial and 6 intermittent streams (see table 6.2.6.1-2). All streams, rivers, or lakes would be within the Hudson River drainage basin.

TABLE 6.2.6.1-2

## Waterbodies Crossed by the ConEd Offset/Taconic Parkway Alternative

Approximate Alternative MP	Waterbody Name	Type <u>a/</u>	Crossing Width (ft)	State Water Quality Classification <u>b/</u>	Construction Crossing Method	Equipment Crossing Required
0.2	Trib. Hudson River	P	10	SB <u>c/</u>	dam & pump	Yes
0.7	Trib. Hudson River	I	3	SC-D	dam & pump <u>d/</u>	Yes
0.9	Trib. Hudson River	I	2	SC-D	dam & pump <u>d/</u>	Yes
1.0	Trib. Hudson River	I	4	SC-D	dam & pump <u>d/</u>	Yes
1.4	Furnace Brook Lake	P	720	B <u>c/</u>	open cut	No
2.2	Trib. Hudson River	P	4	B	dam & pump	Yes
2.7	Trib. Hudson River	P	5	B	dam & pump	Yes
3.6	Trib. Croton River	P	3	B	dam & pump	Yes
3.9	Croton River	P	40	SB <u>c/</u>	dam & pump	Yes
4.2	Trib. Croton River	P	65	B	open cut	No
4.6	Trib. Croton River	P	2	B	dam & pump	Yes
5.1	Trib. Bailey Brook	I	5	D	dam & pump <u>d/</u>	Yes
5.7	Teatown Lake	P	705	B <u>c/</u>	open cut	No
6.0	Trib. Vernay Lake	P	7	B	dam & pump	Yes
7.4	Trib. Pocantico River	I	5	D	dam & pump <u>d/</u>	Yes
8.8	Trib. Pocantico River	I	3	D	dam & pump <u>d/</u>	Yes
11.5	Trib. Pocantico River	P	25	D	dam & pump	Yes

a/ P = Perennial; I = Intermittent  
b/ State Water Use Classification:

- SB Saline Surface Water. Best usages: primary and secondary contact recreation and fishing. These waters shall be suitable for fish propagation and survival.
- SC Saline Surface Water. Best usages: fishing. These waters shall be suitable for fish propagation and survival. The water quality shall be suitable for primary and secondary contact recreation, although other factors may limit the use for these purposes.
- B Fresh Surface Water. Best usages: primary and secondary contact recreation and fishing. These waters shall be suitable for fish propagation and survival.
- D Fresh Surface Water. Best usages: fishing. Due to natural conditions, these waters do not support fish propagation. These water shall be suitable for fish survival. The water quality shall be suitable for primary and secondary contact recreation, although other factors may limit the use for these purposes.

c/ Largemouth and smallmouth bass, timing restriction June 1 to November 30.  
d/ If stream is not flowing at the time of construction, the stream would be open cut.

As described in section 4.3.2 of the FEIS, New York State classifies and protects certain waterbodies on the basis of existing or expected best usage of these waters (NYSDEC, 1994). The ConEd Offset/Taconic Parkway Alternative would cross 8 streams that are classified B and 4 that are classified D. Five of the waterbodies that would be crossed are tidal, two waterbodies are classified as SB waters while three are classified as SC-D waters. A tributary to the Hudson River (Alternative MP 0.2), Furnace Brook Lake (Alternative MP 1.4), Croton River (Alternative MP 3.9), and Teatown Lake (Alternative MP 5.7) all support largemouth and smallmouth bass and construction activities would be limited to the period of June 1 through November 30. This restriction would minimize sedimentation and turbidity induced by seasonal high flow volumes and avoid or limit impact on fish spawning activities that may occur at or downstream of crossing areas. Millennium would use the waterbody construction techniques and implement the mitigation measures to protect surface waters during pipeline construction and operation described in section 5.3.2 of the FEIS.

The crossing of the Croton River (Alternative MP 3.9) would be along ConEd's existing right-of-way about 450 feet east of State Route 129. This crossing would not be within the Croton River and Bay Significant Coastal Fish and Wildlife Habitat designated under the New York State Coastal Management Program. Millennium states that a directional drill of the Croton River at this location would not be feasible given the steep, rocky slopes adjacent to the river. In addition, Millennium indicates that the NYSDEC has approved its proposed dry crossing method (dam and pump) for this waterbody and that it would adhere to strict water quality certification standards imposed by the NYSDEC to ensure that the dry crossing method would prevent any significant turbidity within the Croton River.

The ConEd Offset/Taconic Parkway Alternative crosses the New Croton Reservoir watershed between Alternative MPs 5.0 and 8.1. The watershed crossing was addressed in the DEIS because the originally proposed route traversed the same segment of the watershed between MPs 396.6 and 399.7. Mr. Jim Tierney, the Assistant Attorney General for New York State Attorney General Elliot Spitzer, commented that they had calculated that the ConEd Offset/Taconic Parkway Alternative would place the pipeline through a 2.5-mile-long stretch of the New Croton Reservoir Basin and estimated that pipeline construction would result in the complete removal of roughly 20 to 25 acres of vegetation within the watershed. Our Plan and Millennium's ECS provide for the revegetation of areas disturbed by construction. We believe that the removal of herbaceous and shrubby vegetation would be a short term and temporary impact. Complete reforestation of those portions of the construction right-of-way that are presently forested would be a longer term impact. However, the only permanent conversion of vegetation types would occur within the maintained 50-foot right-of-way. Conservatively assuming a 30-acre construction impact within the watershed, the project would affect less than two hundredths of 1 percent (0.02%) of the entire New Croton Reservoir Basin, which is about 241,920 acres (based on the reported drainage area for the USGS station on the Croton River at the New Croton Dam).

Mr. Tierney further stated that the construction of the pipeline and the disturbance of the soil will result in significant storm water discharges of phosphorus that is now bound in the soil. Millennium would implement its ECS and our Plan and Procedures, which include best management practices used during and after construction to ensure the control of stormwater runoff. Further, construction would require the receipt of a Stormwater Discharge Permit (section 402) from NYSDEC, which could require additional mitigative measures.

Soils found in the area that would be crossed are generally thin. About half of the distance crossed by the pipeline through the watershed is comprised of loam and loamy sand soils (Charlton-Chatfield Complex) while nearly one quarter of the route is comprised of rock outcrops with little or no soil cover. The remainder of the watershed crossing is in relatively flat soils or in surface water features which would not be expected to have erosive environments. Given these characteristics, the only likely source of soil-bound phosphorus would originate from the Charlton-Chatfield Complex segment. Pipeline construction across these soils would cover less than one hundredth of 1 percent (0.01%) of the entire New Croton Reservoir Basin. With the protection measures found in Millennium's ECS and our Plan and Procedures, we believe that measurable phosphorus exports from the construction area would be slight and would be insignificant relative to normal phosphorus inputs into the New Croton Reservoir.

### Wetlands

The ConEd Offset/Taconic Parkway Alternative would cross a total of 21 wetlands, temporarily disturbing about 4.1 acres of wetlands for the construction right-of-way and extra work areas (see table 6.2.6.1-3). Operation and maintenance of the proposed pipeline would affect a total of about 2.3 acres of wetlands.

TABLE 6.2.6.1-3

## Wetlands Crossed by the ConEd Offset/Taconic Parkway Alternative

Approximate Alternative MP	Wetland Number	NWI /NYSDEC Classification <sup>a/</sup>	Length of Crossing (ft)	Acres Affected During Construction	Acres Affected During Operation
0.2	W01CT	PEM	50	0.08	0.02
0.5	W02CT	PFO	85	0.15	0.04
0.6	W03CT	PEM/PSS	25	0.04	0.00
0.7	W04CT	PFO	340	0.48	0.26
0.9	W05CT	PFO	85	0.18	0.05
1.0	W06CT	PFO	70	0.18	0.06
1.5	W07CT	PEM	55	0.02	0.00
2.6	W08CT	PFO	470	0.79	0.27
3.1	W09CT	PSS	135	0.13	0.15
3.1	W10CT	PFO	185	0.36	0.21
4.2	W11CT	PEM/POW	225	0.18	0.26
4.6	W12CT	PFO	115	0.15	0.13
4.7	W13CT	PFO	35	0.03	0.02
5.1	W14CT	PFO	10	0.01	0.00
5.9	W15CT	PSS / O-3	200	0.21	0.23
6.5	W16CT	PEM	90	0.03	0.10
6.9	W17CT	PFO/PEM	180	0.20	0.21
7.4	W18CT	PFO	185	0.32	0.21
10.6	W19CT	POW/PEM	310	0.26	0.08
11.0	W20CT	POW/PEM	175	0.13	0.01
11.2	W21CT	POW/PEM	340	0.12	0.01
	<b>TOTAL</b>		<b>3,365</b>	<b>4.05</b>	<b>2.32</b>

<sup>a/</sup> Classification:

PEM	=	palustrine emergent
PSS	=	palustrine scrub-shrub
PFO	=	palustrine forest
POW	=	palustrine open water
O-3	=	NYDEC Regulated Wetland Number

Wetland W08CT (Alternative MP 2.6) is a forested wetland that occupies most of the central portion of the Jane E. Lytle Memorial Arboretum property and extends northeast across the construction work area of the ConEd Offset/Taconic Parkway Alternative. It would be affected if the pipeline centerline is located 100 feet from the electric conductor on the towers. An arboretum representative indicated that the alternative would also cross underground springs that supply 35 percent of the streamflow to this wetland. However, the arboretum and forested wetland crossing would be minimized since the PSCNY has agreed to allow placement of the pipeline 35 feet closer to the ConEd conductors.

Millennium has consulted with arboretum representatives about construction activities. If the pipeline is constructed on the alternative with a 100-foot offset from the conductors, Millennium stated that it would limit the width of its construction work area to 50 feet, which would preserve up to a 15-foot-wide buffer of trees and shrubs along the ConEd right-of-way. In addition, Millennium would avoid removal of selected trees along the edge of the construction work area, and would plant trees or shrubs (selected in consultation with arboretum representatives) to replace any affected vegetation within the construction work area that is outside of the permanently maintained right-of-way of 10 feet. However, the PSCNY's revision

would allow pipeline placement 35 feet closer to the electric conductors where construction would be adjacent to the arboretum. This means that construction would be moved closer to the cleared ConEd right-of-way thereby further reducing tree clearing in the arboretum.

In the northeast corner of the arboretum, the ConEd Offset/Taconic Parkway Alternative would cross several drainage swales and a small, perennial tributary to the Hudson River. According to arboretum representatives, the swales are critical to the maintenance of wetland W08CT. Sedimentation and changes to surface contours could result in an impact to the drainage swale system. To minimize this impact, Millennium would install erosion and sedimentation controls (i.e., silt fence and sediment barriers) at the downslope edge of the construction work area within Wetland W08CT, before clearing and grading activities take place. We have recommended that Millennium employ a wetland specialist to insure that final grading of wetlands is consistent with the pre-existing grades (see section 5.7.2). With regard to wetland W08CT, we are also recommending that Millennium prepare scaled drawings of the wetland identifying areas that would be disturbed so that post-construction grading can replicate, to the greatest extent practical, the existing grades.

Following construction, Millennium states that the right-of-way would be restored to pre-construction grade and stabilized using a wetland seed mix specified in its ECS. However, an arboretum representative recommends that Millennium use a different seed mix containing native or regionally appropriate species.

The arboretum representative is concerned with the possible spread of *Phragmites australis* from the ConEd right-of-way into wetland W08CT. To address this concern, Millennium proposes to install a vertical plastic barrier along edge of the disturbed area adjacent to the ConEd right-of-way. In addition, Millennium would implement a maintenance program that includes hand removal of *Phragmites australis* from within the construction work area and the permanent right-of-way.

The arboretum also identified additional requirements for the crossing of arboretum lands, including relocation of valuable wetland plants species before construction clearing, confining construction activities to late fall/early spring, and removal of excavated blast rock. While we believe that Millennium's proposed measures would help to minimize impacts on the Jane E. Lytle Arboretum, Millennium has not addressed specific concerns associated with construction timing, planting of native species, or relocation of wetland plants. Therefore, we recommend that:

- **Millennium continue consultations with Jane E. Lytle Memorial Arboretum representatives regarding the specific measures it would implement to minimize impact on the arboretum and wetland W08CT (Alternative MP 2.6) on the ConEd Offset/Taconic Parkway Alternative. These measures should include a provision that the pipeline be located to avoid construction disturbance to Wetland W08CT and to minimize impact on the drainage swales and streams that supply it. In addition, Millennium should include provisions to complete all construction activities (grading through restoration) in the arboretum (Alternative MPs 2.5 to 2.7) at one time in the shortest time possible. Millennium should file with the Secretary the final, site-specific plan that describes measures that would be implemented before and after construction, and includes scaled drawings identifying areas that would be disturbed within the arboretum and plans for restoration plantings and reseeding within the construction work area.**

Two wetlands would be crossed within the Teatown Lake Reservation: Wetland W14CT at Alternative MP 5.1 and Wetland W15CT at Alternative MP 5.9. Wetland W14CT is a forested wetland that extends from the ConEd right-of-way south to the edge of the construction work area for the ConEd

Offset/Taconic Parkway Alternative. Although *Phragmites australis* exists in the portion of the wetland within the existing right-of-way, Millennium does not believe that this species would spread beyond the current wetland boundary. Wetland W15CT (also classified as NYSDEC regulated wetland O-3) is a scrub-shrub wetland located south of Vernay Lake. Millennium indicates that there is no evidence of *Phragmites australis* currently growing within this wetland. Since ConEd does not clear shrubby vegetation from within its right-of-way, Millennium believes that the potential for the spread of *Phragmites australis* to Wetland W15CT would be minimal.

To minimize the potential environmental impact on all jurisdictional wetlands during construction and restoration, Millennium would implement the wetland construction procedures described in section 5.7 of the FEIS and the mitigation methods in its ECS (see appendix E1 in appendix E). In addition, under section VI.D.7 of our Procedures, Millennium is required to coordinate with the state to develop strategies to control the spread of invasive species such as *Phragmites australis*.

### **Fisheries and Wildlife Resources**

Surface waters crossed by the ConEd Offset/Taconic Parkway Alternative support a variety of fish species including warmwater species such as largemouth and smallmouth bass. A tributary to the Hudson River (Alternative MP 0.2), Furnace Brook Lake (Alternative MP 1.4), Croton River (Alternative MP 3.9), and Teatown Lake (Alternative MP 5.7) support largemouth and smallmouth bass. As described above, construction activities would be limited to the period of June 1 through November 30 to minimize sedimentation and turbidity induced by seasonal high flow volumes and avoid or limit impact on fish spawning activities that may occur at or downstream of crossing areas. The Croton River would be crossed north of the upriver extent of the Croton River and Bay Significant Coastal Fish and Wildlife Habitat.

Wildlife species that inhabit the ConEd Offset/Taconic Parkway Alternative include those characteristic of deciduous and coniferous forests, and early successional, wetland, and riparian habitats of the northeastern U.S. and are further described in section 4.4.2 of the FEIS. Short- and long-term impacts on wildlife resources are expected to be minimal since construction of the ConEd Offset/Taconic Parkway Alternative would not significantly alter the urban/suburban character of the land and would occur along and/or adjacent to the existing ConEd right-of-way and Taconic State Parkway. Long-term impacts associated with construction and operation of this alternative would include the loss of about 59.7 acres of upland and wetland forest habitat. Of this total, about 31.7 acres would be within the permanent right-of-way. The remaining 28 acres would be temporary work space and would be allowed to revert to forest following the completion of construction.

The ConEd Offset/Taconic Parkway Alternative could reduce available habitat for forest interior birds within the National Audubon Society's Saw Mill River Brinton Brook Sanctuary and the Jane E. Lytle Memorial Arboretum. However, since this alternative would be constructed along and/or adjacent to the ConEd right-of-way it would not affect optimal interior forest habitat for these species. Potential Blandings turtle habitat was identified by arboretum representatives (based on the Hudsonia study) in an area down gradient of Millennium's construction work area within the central portion of wetland W08CT (Alternative MP 2.6). However, Millennium states that potential Blandings turtle habitat does not exist within the construction work area. To protect all downgradient wetland habitats along its proposed right-of-way, Millennium would install appropriate erosion and sedimentation controls along the construction work area. We contacted the NYSDEC in August 2001 regarding the potential for Blandings turtle habitat in the arboretum. The NYSDEC stated that there are no known records of Blandings turtles in Westchester County and that the Hudsonia Study only listed plant associations that are likely for turtles or other species (NYSDEC, 2001). This does not mean that Blandings turtles are there or were ever there.

To minimize the potential environmental impact on fisheries and wildlife, Millennium would implement the mitigation measures described in sections 5.4.1 and 5.4.2 of the FEIS and the mitigation methods in its ECS (see appendix E).

## Vegetation

Vegetation within the region is described in section 4.5 of the FEIS. Construction of the ConEd Offset/Taconic Parkway Alternative would affect about 44.2 acres of upland and wetland forest vegetation. Of this total, about 21 acres would be within the permanent right-of-way and the remaining 23.2 acres would be within temporary work space and allowed to revert to forest following the completion of construction.

The ConEd Offset/Taconic Parkway Alternative would cross the Teatown Lake Reservation between Alternative MPs 4.8 and 6.2. The primary impact in this area would be associated with the clearing of about 8.5 acres of forest within Millennium's 50-foot-wide construction work area. In addition, forest at two small staging areas at Alternative MPs 4.5 and 4.6 would be cleared to accommodate two wetland crossings (wetlands W12CT and W13CT) within the reservation. These temporary staging areas would affect a total of 0.3 acre of forest.

Forest impacts would be long term or permanent. Within the Teatown Lake Reservation, these impacts would be minimized to the extent possible by narrowing the construction work area to 50 feet and maintaining the right-of-way in forested areas in accordance with those specified for wetlands (a 10-foot-wide corridor centered on the pipeline, see section VI.C of Millennium's ECS). About 10.5 acres of forest would be cleared within the Teatown Lake Reservation, and between 1.6 and 4.9 of these areas would be maintained in herbaceous or scrub vegetation. Millennium states that it would continue to coordinate with Teatown Lake Reservation representatives regarding restoration of the construction work area, including replanting trees, and to identify all reasonable restoration and mitigation activities prior to and during construction. Millennium would also notify reservation representatives one week before the beginning of construction activities within the reservation and would provide weekly updates on the location and progress of construction.

Along the Taconic State Parkway, construction of the ConEd Offset/Taconic Parkway Alternative would require the removal of trees at five locations: 1) between Alternative MPs 8.0 and 8.3 where the alternative deviates from the Taconic State Parkway shoulder at the State Route 100 overpass; 2) between Alternative MPs 9.4 and 9.5 where the alternative leaves the North County Trail, ascends a hillside, and returns to the Taconic State Parkway shoulder; 3) between Alternative MPs 10.0 and 10.1 where the alternative would cross an area of recently planted landscape trees; 4) between Alternative MPs 11.4 and 11.5 where the alternative would deviate from Taconic State Parkway shoulder to cross the Pocantico River; and 5) between Alternative MPs 13.2 and 13.3 at the southern end of the alternative where the alternative would leave the Taconic State Parkway shoulder and cross mostly forested land to the North County Trail.

Millennium indicates that the majority of its construction activities along the Taconic State Parkway would be conducted within a "clear zone" adjacent to the parkway or along the road shoulder. This "clear zone" is about 15 to 20 feet wide and would provide adequate space for construction activities to occur along the parkway. Millennium would continue consultations with the NYSDOT regarding restoration requirements along the Taconic State Parkway. These requirements typically include the replacement of trees and other landscaping along the parkway, "in-kind" and number but not necessarily of the same size. Once an agreement is reached with the NYSDOT, Millennium would file a copy of the final agreement and planting specifications with the Commission before construction. To minimize the potential environmental impact on vegetation, Millennium would implement the mitigation measures described in section 5.5 of the FEIS and the mitigation methods in its ECS (see appendix E).

## Land Use and Residential Areas

### Land Use

The ConEd Offset/Taconic Parkway Alternative would be installed along and/or adjacent to the ConEd right-of-way for about 7.6 miles and the Taconic State Parkway for 5.7 miles. Using the typical right-of-way cross-sections shown in appendix C and the extra work areas, construction of the ConEd Offset/Taconic Parkway Alternative would affect a total of about 168.6 acres of land comprising 7.0 acres of industrial/commercial land, 93.1 acres of open land, 59.7 acres of forest, 2.3 acres of residential land, and 6.5 acres of water. About 70.9 acres of the land affected by construction would be for extra work and/or staging areas. Operation would affect an estimated 80.6 acres of land based on a permanent easement width of 50 feet (see table 6.2.6.1-4). To minimize visual impacts and allow as many trees as possible to regenerate, Millennium would only maintain 10 to 30 feet of the permanent right-of-way in herbaceous or shrub vegetation.

TABLE 6.2.6.1-4

#### Acreeage Affected by Construction and Operation of the ConEd Offset/Taconic Parkway Alternative

Land Use Type	Acres Affected During Construction	Acres Affected During Operation
Forest <u>a/</u>	59.7	31.7
Open Land <u>b/</u>	93.1	37.6
Residential	2.3	2.0
Industrial/Commercial	7.0	7.0
Open Water	6.5	2.3
<b>Total</b>	<b>168.6</b>	<b>80.6</b>

a/ Includes forested wetlands  
b/ Includes the emergent and scrub-shrub wetlands.

Along the ConEd right-of-way, Millennium's construction right-of-way would be about 75 feet wide, with the pipeline installed along the outer edge of the ConEd right-of-way and the working side within the ConEd right-of-way (see cross-sections ST-D002-000-A-1091 No. 1 and No. 2 in appendix C3). At several locations, the construction work area along this segment varies from the typical configuration. The construction right-of-way would be reduced to minimize impacts on residences or in locations where the pipeline would cross public lands. In other areas, the work area may be expanded for sidling and/or staging areas.

Along the Taconic State Parkway, Millennium's typical construction right-of-way area would be along the west side, southbound travel lane. It would be between 20 and 60 feet wide, depending on the width of available "clear zone" along the parkway shoulder and by site-specific topography (see cross-sections ST-D002-000-A-1093 through 1097 in appendix C3).

Both Croton-on-Hudson and Cortlandt are within designated CZM areas. However, the alternative would be on the eastern edge of these municipalities, and several miles from the Hudson River.

## Residential Areas

In residential areas, the two most significant impacts associated with construction and operation of a pipeline include disturbance during construction and the limitation on future residential or other permanent structures on the right-of-way. Since residences adjacent to the construction work areas would be most affected, we identify residences within 50 feet of the construction work areas to determine the degree of impact and the appropriate mitigation.

Millennium originally identified seven residences that would be within 50 feet of the construction work area of the ConEd Offset/Taconic Parkway Alternative, all of which are adjacent to the ConEd Offset portion of the alternative (see table 6.2.6.1-5). However, following the June 18, 2001 modification, only two residences would be within 25 feet of the construction work area (Alternative MP 3.7). These residences cannot be avoided since the powerline corridor passes between the residences.

TABLE 6.2.6.1-5

### Residences within 50 feet of the ConEd Offset/Taconic Parkway Alternative Construction Work Area

County	Approximate Alternative MP	Distance from Construction Work Area (ft)	Distance from Pipeline Centerline (ft)	Proposed Mitigation
Westchester	0.6	30/65 <u>a/</u>	45/80 <u>a/</u>	Narrow work space towards residence.
	0.8	40/75 <u>a/</u>	45/80 <u>a/</u>	Shift centerline and narrow work space toward residence. <u>b/</u>
	1.0	35/70 <u>a/</u>	50/85 <u>a/</u>	Narrow work space towards residence.
	3.1	50/85 <u>a/</u>	55/90 <u>a/</u>	Shift centerline and narrow work space toward residence. <u>b/</u>
	3.7	10	25	Narrow work space towards residence. <u>b/</u>
	3.7	10	60	Site-specific plan. <u>b/</u>
	7.1	45/80 <u>a/</u>	60/95 <u>a/</u>	Millennium's ECS and standard residential mitigation.

a/ The first number is calculated from the original location with the pipeline placed 100 feet from the outside conductors on the electric towers as defined in the SMOU. The second number is calculated from the revised location that is 35 feet closer to the tower as described in the PSCNY's June 19, 2001 letter

b/ Site-specific plans filed.

In addition to the seven residences identified within 50 feet of the construction work area, Millennium identified 59 residences that would be between 50 and 200 feet of the construction work area. Twenty-four of these residences would be between 50 and 100 feet, sixteen residences would be between 100 and 150 feet, and nineteen residences would be between 150 and 200 feet of the construction work area.

We received a large number of comments from residents whose properties abut the ConEd right-of-way. Concerns included potential damage to structures (including septic systems and oil tanks) from blasting and loss of tree screening between the existing ConEd right-of-way and the residence. We have recommended that Millennium develop a detailed blasting plan to minimize the potential for damage on nearby structures.

Construction of the ConEd Offset/Taconic Parkway Alternative would alter the existing visual environment for residences that abut the ConEd segment of the alternative. This is due primarily to the removal of existing vegetation within the existing electric right-of-way that is owned in fee by ConEd. In June 2001, the PSCNY agreed to allow Millennium to change the location of the pipeline offset to 100 feet from the center of the tower structure, rather than 100 feet from the conductor between Alternative MPs 0.47 to 1.16, MPs 2.4 and 3.21, and MPs 7.04 to 7.2. This would preserve an extra 35 feet of existing vegetation adjacent to the affected residences at Alternative MPs 0.6, 1.0, 3.1 and 7.1. No reduction in offset is proposed for the two residences at Alternative MP 3.7 since there is no existing vegetative screening.

Millennium proposes to implement the mitigation specified in section 5.8.2.2 of the FEIS and has provided a general site-specific plan for the residences at Alternative MPs 0.8, 3.1, and 3.7. However, because the visual character of the areas between MPs 0.6 and 3.1 and at MP 7.1 would be altered, we recommend that:

- **Millennium should prepare site-specific mitigation plans for residential properties adjacent to the ConEd Offset portion of the ConEd Offset/Taconic Parkway Alternative where tree screening would be removed and specifically at Alternative MPs 0.6, 0.8, 1.0, 3.1, and 7.1. For each property, Millennium should prepare a dimensioned site plan that shows:**
  - a. **the location of the residence in relation to the new pipeline, the ConEd right-of-way, and the nearest existing ConEd structures;**
  - b. **the edge of the construction work area;**
  - c. **the edge of the new permanent right-of-way;**
  - d. **vegetation that would be removed or preserved;**
  - e. **a description of how the property would be protected from construction activities, and**
  - f. **a restoration plan that describes how the construction right-of-way would be restored and replanted.**

**These plan(s) should be filed with the Secretary for review and approval by the Director of OEP before construction.**

#### Todd Elementary School, Briarcliff High Schools, and Pace University

The Todd Elementary School is located about 30 feet above the Taconic State Parkway at Alternative MP 10.7, north of Pleasantville Road. The distance between the alternative's proposed centerline and the nearest building on school property would be about 150 feet whereas the distance between the pipeline and the nearest school property boundary would be about 75 feet. We received a number of comment letters requesting that the pipeline be placed on the other (northbound) side of the Taconic State Parkway in this area because of safety concerns due to the proximity of the pipeline to the school (see Taconic State Parkway East discussion below). We note that this section of the pipeline would be subject to the additional safety measures specified in the MOU and SMOU that include increased pipe wall thickness, more stringent pipe durability criteria, higher pressure testing requirements, and more frequent smart pig surveys. The PSCNY states that these pipeline design requirements are the same as those required for natural gas pipeline construction in and along densely populated urban streets. We believe these measures adequately address safety concerns associated with the proximity of the pipeline to the school.

The Briarcliff Middle and High Schools are on the east side of the Taconic State Parkway near Alternative MP 11.7. The distance between the pipeline and the nearest building on school property would be about 725 feet whereas the distance between the pipeline and the nearest school property boundary would

be about 350 feet. The vertical separation between the high school and the pipeline would be about 70 feet. Although concerns similar to those identified for the Todd Elementary School were identified for the Briarcliff High School, this property is a greater distance from the pipeline than the Todd School. In addition, the added mitigation measures specified in the MOU and SMOU would still apply to the pipeline where it would be near the school since it would be near the ConEd right-of-way.

Pace University is located about 1,000 feet east of approximate Alternative MP12.6. As stated above, we believe proposed mitigation would avoid impact on the university.

### Dioxin

The Village of Croton-on-Hudson commented that the PSCNY records indicate that ConEd historically applied herbicides containing 2,4-dichlorophenoxyacetic acid (2,4-D) and 2,4,5-trichlorophenoxyacetic acid (2,4,5-T) along portions of the ConEd right-of-way. The herbicide compound 2,4,5-T is known to contain as a production byproduct 2,3,7,8-tetrachlorodibenzo-*p*-dioxin (2,3,7,8-TCDD), or "dioxin," a highly toxic substance that is designated as a "Known Human Carcinogen."<sup>7/</sup> The village and landowners along the ConEd right-of-way believe that dioxins or other contaminants could be disturbed and become airborne as dust or otherwise released into the environment during blasting, excavation, or other pipeline construction activities. This would result in exposure to people through inhalation of dust or from surface or drinking water that would become contaminated by these construction-related releases.

Dioxin is a general name that refers to a family of chemicals consisting of 75 different polychlorinated dibenzo-*p*-dioxins (PCDD) and 135 different poly-chlorinated-dibenzo furans (PCDF). Dioxins are released into the air from waste combustion processes (i.e., commercial or municipal waste incineration) and from organic combustion processes (i.e., burning of wood, coal, or oil). In fact, if dioxins are present along the right-of-way, it is likely that they could be from sources other than ConEd's spraying of herbicides. A large part of the current exposures to dioxins in the U.S. are due to man-made dioxins from releases that occurred in the past, even decades ago. Because dioxins can be extremely persistent compounds, current levels of dioxins in the environment may be due to releases that occurred many years ago, possibly some distance away. However, even if all human-generated dioxins could somehow be eliminated, low levels of naturally produced dioxins will remain.<sup>8/</sup>

Sometimes, the word dioxin is used to refer to the most well studied and one of the most toxic dioxin-like compounds, 2,3,7,8-TCDD. The commercial grade 2,4,5-T applied by ConEd could have contained very low concentrations of 2,3,7,8-TCDD. Before 1965, commercial 2,4,5-T contained a production byproduct of up to 30 parts per million (ppm) 2,3,7,8-TCDD or more. Agent Orange (a 50:50 mixture of the N-butyl esters of 2,4,5-T and 2,4-D that was used in the Vietnam War as a defoliant during 1962-1970) contained 2 to 30 ppm 2,3,7,8-TCDD.<sup>9/</sup> In March 1979, the EPA required suspension of the use of 2,4,5-T on forests, rights-of-way, cultivated pastures, yards, and gardens. By the mid-1980s, commercial 2,4,5-T contained no more than 0.01 ppm 2,3,7,8-TCDD.

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Profile of 2,3,7,8-Tetrachlorobenzo-*p*-Dioxin (TCDD), 9th Report on Carcinogens (Revised January 2001), U.S. Department of Health and Human Services, Public Health Service, National Toxicology Program, available at <http://ehis.niehs.nih.gov/roc/toc9.html>.

Dioxin Advisories and Guidance. U.S. Department of Agriculture, February 6 2001 (<http://www.fsis.usda.gov/OA/topics/dioxmenu.htm>).

Profile of 2,3,7,8-TCDD, 9th Report on Carcinogens (Revised January 2001), U.S. Department of Health and Human Services, Public Health Service, National Toxicology Program, available at <http://ehis.niehs.nih.gov/roc/toc9.html>.

Food is the major source (>90 percent) of human exposure to polychlorinated dibenzo-p-dioxins. An average daily adult intake of 2,3,7,8-TCDD was estimated to be 47 picograms (pg) per day.<sup>10/</sup> Other pathways of exposure include inhalation of 2,3,7,8-TCDD from municipal, medical, and industrial waste incinerators and other incineration and combustion processes (about 2 percent of the daily intake), and ingestion of drinking water (<0.01 percent of the daily intake). 2,3,7,8-TCDD has been found in plastic packaging, clothes dryer lint, vacuum cleaner dust, room and car air filters, furnace filter dust, and bleached paper products.<sup>11/</sup>

Laboratory analyses for dioxin-like compounds tend to report two types of results. This is because of the highly variable toxicity of the individual compounds within the family of dibenzodioxins and dibenzofurans. These compounds are differentiated by the number and location of chlorine atoms attached to the molecule. First, dibenzodioxin and dibenzofuran compounds are differentiated on the basis of the number of chlorine atoms that are attached to each two-ring molecule structure that is characteristic of these compounds. Given the shape of the dibenzodioxin (dioxin) and dibenzofuran (furan) molecules, there can be from 1 to 8 chlorine atoms attached at different locations around the two outer rings. When there are 4 chlorine atoms attached to a dibenzodioxin molecule, that molecule is “tetrachlorodibenzodioxin.” When there are 5 chlorine atoms attached to a dibenzofuran molecule, that molecule is “pentachlorodibenzofuran.” It has also been determined that when the chlorine atoms are attached to the locations on the two rings that chemists have labeled the 2, 3, 7, and 8 positions, the toxicity of that compound is much greater than when the chlorine is attached at other locations. Further, it has been determined that the specific tetrachlorodibenzodioxin (or TCDD) compound that has 4 chlorine atoms attached at the 2, 3, 7 and 8 positions is the most toxic form. It has become common practice by regulatory agency toxicologists and other health groups like the World Health Organization to express the toxicity of the other dioxin-like compounds with 4 chlorine atoms attached at the 2, 3, 7 and 8 positions in terms of their relative toxicity with respect to 2,3,7,8-TCDD. These relative toxic equivalency factors (TEFs) define the toxicity of a particular compound relative to 2,3,7,8-TCDD. Since 2,3,7,8-TCDD is considered to be among the most toxic dioxin-like compounds, the TEFs are typically factors less than 1.0. If a compound has a TEF of 1.0, it is considered equally as toxic as 2,3,7,8-TCDD. Compounds with a TEF of 0.1, for example, would be one tenth as toxic as 2,3,7,8-TCDD, while a compound with a TEF of 0 would not be toxic at all. Table 6.2.6.1-6 lists the TEFs for the full family of dioxin-like compounds published by the World Health Organization.<sup>12/</sup>

Given these differences in toxicity, analytical laboratories typically quantify the specific dioxin and furan compounds with non-zero TEFs, and the total amount of compound with a given number of attached chlorine atoms (i.e., all TCDD, all HexaCDD, all PentaCDF). This reporting facilitates quantifying both the total concentration of dioxins and furans present, as well as the toxicologically-equivalent concentrations of 2,3,7,8-TCDD.

On a similar note, a commentor expressed concern that if 2,3,7,8-TCDD does break down, that the resulting compounds, or metabolites, could prove as toxic or worse. Structure-activity studies of 2,3,7,8-TCDD and related compounds support the widely accepted principle that the parent compound is the active

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<sup>10/</sup> Agency for Toxic Substances and Disease Registry. Toxicological Profile for Chlorinated Dibenzo-p-dioxin. Update (Final Report). Atlanta, GA: ATSDR, Public Health Service. U.S. Department of Health and Human Services. 1998. 678 pp. NTIS Accession No. PB99-121998.

<sup>12/</sup> Toxic Equivalency Factors (TEFs) for PCBs, PCDDs, PCDFs for Humans and Wildlife. Van denBerg, M., et al. Environmental Health Perspectives, Volume 106, Number 12, December 1998.

form and that metabolism is a detoxification process that results in a less toxic metabolite.<sup>13/</sup> Therefore, we believe that any metabolites formed from the breakdown of 2,3,7,8-TCDD would not add risk and no further discussion on metabolites is necessary.

TABLE 6.2.6.1-6 Toxic Equivalency Factors	
Dioxin-Like Compound (Cogener)	Toxic Equivalency Factor (TEF)
<b>DIBENZODIOXINS:</b>	
All MonoCDDs (with 1 chlorine atom)	0
All DiCDDs (with 2 chlorine atoms)	0
All TriCDDs (with 3 chlorine atoms)	0
2,3,7,8-TCDD	1.0
All Other TCDDs (with 4 chlorine atoms)	0
1,2,3,7,8-PentaCDD	1.0
All Other PentaCDDs (with 5 chlorine atoms)	0
1,2,3,4,7,8-HexaCDD	0.1
1,2,3,6,7,8-HexaCDD	0.1
1,2,3,7,8,9-HexaCDD	0.1
All Other HexaCDDs (with 6 chlorine atoms)	0
1,2,3,4,6,7,8-HeptaCDD	0.01
All Other HeptaCDDs (with 7 chlorine atoms)	0
OctaCDD	0.0001
<b>DIBENZOFURANS:</b>	
All MonoCDFs (with 1 chlorine atom)	0
All DiCDFs (with 2 chlorine atoms)	0
All TriCDFs (with 3 chlorine atoms)	0
2,3,7,8-TCDF	0.1
All Other TCDFs (with 4 chlorine atoms)	0
1,2,3,7,8-PentaCDF	0.05
2,3,4,7,8-PentaCDF	0.5
All Other PentaCDFs (with 5 chlorine atoms)	0
1,2,3,4,7,8-HexaCDF	0.1
1,2,3,6,7,8-HexaCDF	0.1
1,2,3,7,8,9-HexaCDF	0.1
All Other HexaCDFs (with 6 chlorine atoms)	0
1,2,3,4,6,7,8-HeptaCDF	0.01
1,2,3,4,7,8,9-HeptaCDF	0.01
All Other HeptaCDFs (with 7 chlorine atoms)	0
OctaCDF	0.0001

As can be seen given this information, the total concentration of all the dioxins and furans as quantified by the straight sum of the "totals" measured (i.e., All MonoCDDs + All DiCDDs + ... + All OctaCDDs + All MonoCDFs + All DiCDFs + ... + All OctaCDFs) has no direct bearing on the level of risk posed by the mixture of dioxin and furan compounds. The majority of the mass of dioxins and furans in a typical mixture are compounds that have no TEF or a very low TEF, and thus contribute little or no toxicity to the mixture. The measure of "dioxin" concentration with a direct bearing on risk due to exposure is the Toxic Equivalent (TEQ) concentration of the mixture. The TEQ is the concentration of all the dioxin and furan compounds in the mixture in terms of the concentration of 2,3,7,8-TCDD that would be expected to produce the same toxic effect. The TEQ is calculated by multiplying the actual measured concentration of each dioxin and furan compound by its TEF, and summing the values obtained. As such, discussions about the potential risks associated with exposure to environmental media containing a mixture of dioxin and furan compounds are meaningful only when the media are characterized in terms of their 2,3,7,8-TCDD TEQ concentration. In order to adequately compare concentrations of dioxins, further discussions in this document will be in terms of 2,3,7,8-TCDD TEQ concentrations.

<http://toxnet.nlm.nih.gov> search using TOXLINE

A number of benchmark values have been calculated and/or published by regulatory agencies for purposes of screening measured dioxin levels or managing the risks associated with dioxin in the environment. The proposed pipeline route is in New York and within the boundaries of EPA Region 2. The most relevant benchmark values to consider for dioxin, given the location of the proposed pipeline, are values published by the EPA Region 2 or the NYSDEC. Within this set of geographically relevant benchmark values, there are risk-based values and values established by policy.

The principal policy defining benchmark values for dioxin-like compounds in soil is the EPA's directive on the clean-up of dioxin at contaminated sites published in 1998.<sup>14/</sup> This directive recommends preliminary remediation levels for dioxin in soil at contaminated sites being addressed under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and Resource Conservation and Recovery Act (RCRA). This directive establishes 1 part per billion (ppb) of 2,3,7,8-TCDD TEQ concentration as the starting point for setting a clean-up level for dioxin in surface soil involving residential exposure. The directive also establishes 5 to 20 ppb of 2,3,7,8-TCDD TEQ concentration as the starting point for setting a clean-up level for dioxin in surface soil involving commercial or industrial exposure. These values are considered by the EPA to be protective of human health and the environment at CERCLA and RCRA sites where dioxin is a principal contaminant of concern. These values are associated with estimates of excess cancer risk that are at the higher end of the range of excess cancer risk that is generally acceptable at Superfund sites (approximately  $2.5 \times 10^{-4}$  and  $1.3 \times 10^{-4}$ , respectively).<sup>15/</sup> The values were published in recognition of the variability associated with potential exposures (and not well-defined, specific activities that could lead to exposures) and uncertainties associated with the toxicity of 2,3,7,8-TCDD.

The EPA also publishes risk-based benchmark criteria for use in screening and evaluating soil contamination levels. EPA Region 3 was the first to publish such values for soil associated with exposure to people in a residential or an industrial setting. The EPA Region 3 benchmark criteria are the 2,3,7,8-TCDD TEQ concentration in soil that would lead to an excess cancer risk of  $1 \times 10^{-6}$  assuming a person would incidentally ingest soil with that level of contamination in an amount consistent with the conduct of typical residential or industrial activities. The current EPA Region 3 risk-based concentrations (RBCs) for residential and industrial soil are  $4.3 \times 10^{-6}$  mg/kg (0.0043 ppb of 2,3,7,8-TCDD TEQ) and  $3.8 \times 10^{-5}$  mg/kg (0.038 ppb of 2,3,7,8-TCDD TEQ), respectively.<sup>16/</sup> These values are based on daily residential exposure 350 days/year for 30 years (during childhood and adult ages), and on 250 days/year for 25 years (as an adult worker).

EPA Region 9 also publishes risk-based soil screening criteria for residential and industrial soil. EPA Region 9 benchmark values, referred to as preliminary remediation goals (PRGs), are based on an excess cancer risk of  $1 \times 10^{-6}$  and the same residential and industrial exposure parameters that are used by EPA Region 3.<sup>17/</sup> The principal difference between the two sets of criteria is that the EPA Region 9 values account for dermal absorption and the inhalation of particulates and volatiles of dioxin-like compounds in

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"Approach for Addressing Dioxin in Soil at CERCLA and RCRA Sites," OSWER Directive 9200.4-26, Memorandum from Timothy Fields, Jr., Acting Administrator of the EPA Office of Solid Waste and Emergency Response, to the Directors of Various Offices, Programs and Regions, April 13, 1998, page 2.

Ibid., page 3 (the generally accepted target risk range is  $1 \times 10^{-4}$  to  $1 \times 10^{-6}$  excess cancer probability)

<sup>16/</sup> "EPA Region 3 Risk-Based Concentration Table: Technical Background Information" Jennifer Hubbard, Revised 4/12/99, <http://www.epa.gov/reg3hwmd/risk/tech99.pdf>, and Table dated 5/8/2001, <http://www.epa.gov/reg3hwmd/risk/RB0501.pdf>.

"EPA Region 9: Preliminary Remediation Goals," Background Information Smucker <http://www.epa.gov/reg9/waste/sfund/prg/files/background..pdf>, and Table dated 11/01/00.

the soil, in addition to the intake of contaminant from incidental ingestion (the only intake route considered in the EPA Region 3 RBCs). Because more intake of contaminated soil is assumed as the result of the additional exposure routes, the EPA Region 9 PRGs are somewhat lower than the corresponding EPA Region 3 RBCs. The current EPA Region 9 PRGs for residential and industrial soil are  $3.9 \times 10^{-6}$  mg/kg (0.0039 ppb of 2,3,7,8-TCDD TEQ) and  $2.7 \times 10^{-5}$  mg/kg (0.027 ppb of 2,3,7,8-TCDD TEQ), respectively. EPA Region 2 currently recommends using the EPA Region 9 PRGs for purposes of risk-based screening of soil contaminant levels. Therefore, the EPA Region 9 PRGs are also meaningful benchmark values for comparison.

The NYSDEC's Division of Environmental Remediation has published and maintains technical guidance on determination of soil clean-up objectives and cleanup levels in state soils.<sup>18/</sup> The Technical and Administrative Guidance memorandum (TAGM) No. 4046 provides a basis and procedure for developing soil cleanup levels in the state. These standards consider the protection of human health and the environment and, as such, would also be meaningful benchmark criteria for an evaluation of the level of dioxin-like compounds in soils. TAGM No. 4046 does not list an overall recommended soil cleanup objective for 2,3,7,8-TCDD.<sup>19/</sup> TAGM No. 4046 does, however, identify a soil cleanup objective to protect groundwater quality of 0.06 ppm of 2,3,7,8-TCDD (60 ppb) assuming the default dilution attenuation factor of 100 to account for contaminant dispersion between a source of soil and the location some distance away where there may be exposure to migrating groundwater or groundwater breakout to surface water.<sup>20/</sup>

ConEd states that it minimizes the use of herbicides on its properties through a formalized right-of-way maintenance program and that it reports annually to the PSCNY regarding that program and the use of herbicides. By law, only appropriately registered herbicide products may be applied and all herbicides used on ConEd's properties are applied by state- and EPA-registered technicians, whose activities and licenses are reviewed annually by the state. ConEd further states that herbicides are only applied along the cleared portion of the right-of-way, and not along the outer edge of the right-of-way which is occupied by tall trees and other vegetation. Thus, ConEd has no reason to believe that herbicide residues exist or constitute a risk to health and safety on the cleared portions of the Westchester County right-of-way. Further, ConEd believes it is even less likely that herbicide residues exist on areas that might be affected by construction of the Millennium pipeline because those areas are primarily along the uncleared outer portion of the right-of-way that would not have received direct herbicide applications.

Technicians typically apply herbicides with a sprayer to individual stems. This method of application minimizes the potential for the substance to drift to other areas where its application is not intended or needed. Due to their physiochemical properties,<sup>21/</sup> the herbicides 2,4-D and 2,4,5-T have a tendency to adhere to soil and to not volatilize into the air. Both 2,4-D and 2,4,5-T are generally known to degrade due to microbial biodegradation processes or photochemical decomposition, with persistency in the soil rarely exceeding one full growing season.<sup>22/</sup> They also have low to moderate solubility in water and, as such, do not tend to leach to a large degree and migrate with groundwater flow. As such, the most likely

<sup>18/</sup> "Technical and Administrative Guidance Memorandum No. 4046: Determination of Soil Cleanup Objectives and Cleanup Levels," NYSDEC, Division of Environmental Remediation, January 24, 1994 (Revised), <http://www.dec.state.ny.us/website/der/tagms/prtg4046.html>.

<sup>19/</sup> Ibid. Table 3 in Appendix A.

Ibid.

<sup>21/</sup> Based on a review of the sorption coefficients, Henry's Law Constants, and solubilities for these two compounds.

<http://toxnet.nlm.nih.gov> search using Hazardous Substance Data Bank

way for these compounds to migrate from where they are initially applied is via the bulk motion of the soil to which they adhere. This would include erosion and surface water run-off; blowing dust, vehicle traffic, or vigorous excavation or blasting; or the physical movement of the soil as part of construction and regrading activities.

The village of Croton-on Hudson and other commentors questioned Millennium's assumptions concerning the environmental fate of 2,3,7,8-TCDD in soils, claiming that Millennium's assumptions underestimate predicted concentrations. Commentors claim that the half-life for 2,3,7,8-TCDD is over 20 years, if it ever degrades, while Millennium claims that the half life for 2,3,7,8-TCDD is in the range of less than 1 year to 3 years. Based on our literature review, we would agree with Millennium that the half-life for 2,3,7,8-TCDD has been reported by the EPA as ranging from less than 1 year to 3 years at soil surface and up to 12 years at deep or interior soils.<sup>23/</sup> Commentors also claim that 2,3,7,8-TCDD would bind strongly to soil surfaces and would not migrate further than the top 0.25 inches through the soil column. However, our literature review again agrees with Millennium's conclusions that 2,3,7,8-TCDD could penetrate into the top 6 inches of soil.<sup>24/</sup>

Millennium conducted soil sampling to determine the amount of residual herbicides containing 2,4-D and 2,4,5-T. The sampling was conducted to investigate whether historical herbicide use could pose an exposure concern for residents living near the proposed route during or after pipeline construction. Millennium collected 13 samples from the ConEd right-of-way at locations that were selected based on the proximity of the proposed pipeline to developed areas and the proximity of the pipeline alignment to the cleared portion of the right-of-way where herbicides were historically applied. The samples were combined into four composite samples: CP123 (MPs 0.51, 0.8, and 0.9), CP4567 (MPs 1.4, 1.6, 2.8 and 2.9), CP89 (MPs 3.9 and 5.62), and CP10-13 (MPs 6.87, 7.07, 7.2, 7.3). All samples analyzed were far below the EPA Region 3 RBCs, the EPA Region 9 PRGs, and the NYSDEC cleanup objectives for these compounds for unrestricted use of soil (see table 6.2.6.1-7).

TABLE 6.2.6.1-7

Results of Millennium's Soil Sampling Relative to Risk-Based Regulatory Screening Criteria (ug/Kg or ppb)

Parameters	Sample CP123 Results	Sample CP4567 Results	Sample CP89 Results	Sample CP10-13 Results	EPA Region 3 Risk- Based Concentration	EPA Region 9 Preliminary Remediation Goal	NYSDEC TAGM-4046 Cleanup Objective
2,4-D	< 14	< 13	< 13	< 15	780,000	690,000	500 <sup>a/</sup>
2,4,5-T	< 7.2	< 6.6	< 6.7	< 7.5	780,000	610,000	1,900 <sup>a/</sup>

Samples collected on June 5, 2001.

<sup>a/</sup> Cleanup Objective based on protection of groundwater resources relative to state standard.

Millennium did not analyze soil samples for dioxins or furans. Several commentors noted that Millennium should have tested for these substances in addition to the herbicides. The Village of Croton-on-Hudson did not have permission to sample on the ConEd right-of-way, so it collected six samples from locations near the ConEd right-of-way that were designated: Arboretum 1, 2, and 3, and Village Property,

<sup>23/</sup> National Primary Drinking Water Regulations Technical Factsheet on DIOXIN (2,3,7,8-TCDD), <http://www.epa.gov/safewater/dwh/t-soc/dioxin.html>; <http://toxnet.nlm.nih.gov> search using Hazardous Substance Data Bank

<sup>24/</sup> Ibid.

Mount Airy Road, and Batten Road. The village did not provide the exact location of these samples in relation to the ConEd right-of-way. Four of the six samples reported non-detect levels of the specific congener 2,3,7,8-TCDD, but detectable levels of some other dioxin and furan congeners. However, we used the dioxin levels measured in the soil samples collected by the village to calculate the 2,3,7,8-TCDD TEQ concentrations so that the levels could be compared to risk-based screening criteria. As shown on table 6.2.6.1-8, the 2,3,7,8-TCDD TEQ was well below the NYSDEC and EPA policy-based cleanup directives.

TABLE 6.2.6.1-8

Results of Village of Croton-on-Hudson's Soil Sampling Relative to Risk-Based Regulatory Screening Criteria (ug/Kg or ppb TEQ)

Village of Croton-on-Hudson Sample Location	Calculated 2,3,7,8-TCDD TEQ Concentration	NYSDEC Directive to Protect Groundwater Quality	EPA Directive Residential Soil Cleanup Level	Risk-Based Screening Criteria			
				EPA Region 9		EPA Region 3	
				Residential	Industrial	Residential	Industrial
Arboretum 1	0.0026	60.0	1.0	0.0039	0.027	0.0043	0.038
Arboretum 2	0.0039	60.0	1.0	0.0039	0.027	0.0043	0.038
Arboretum 3	0.0009	60.0	1.0	0.0039	0.027	0.0043	0.038
Village Property	0.0086	60.0	1.0	0.0039	0.027	0.0043	0.038
Mt. Airy Road	0.0058	60.0	1.0	0.0039	0.027	0.0043	0.038
Batten Road	0.0041	60.0	1.0	0.0039	0.027	0.0043	0.038

Samples collected on June 11, 2001.

The town of Cortlandt and the group Not Under My Backyard (NUMB) requested permission to sample for dioxins on the ConEd right-of-way. ConEd had indicated that sampling would only be allowed upon FERC approval of the sampling protocol. As the landowner, ConEd may impose conditions on the testing program, with or without FERC's input. We would suggest that ConEd, Cortlandt, and NUMB consult with EPA Region 2 or NYSDEC if there is continuing disagreement on the sampling protocol. We have no objections to the independent testing for dioxins on ConEd's right-of-way if Cortlandt and NUMB feel that this is necessary for peace of mind. However, we reiterate that testing by the Village of Croton-on-Hudson revealed levels far below cleanup directives.

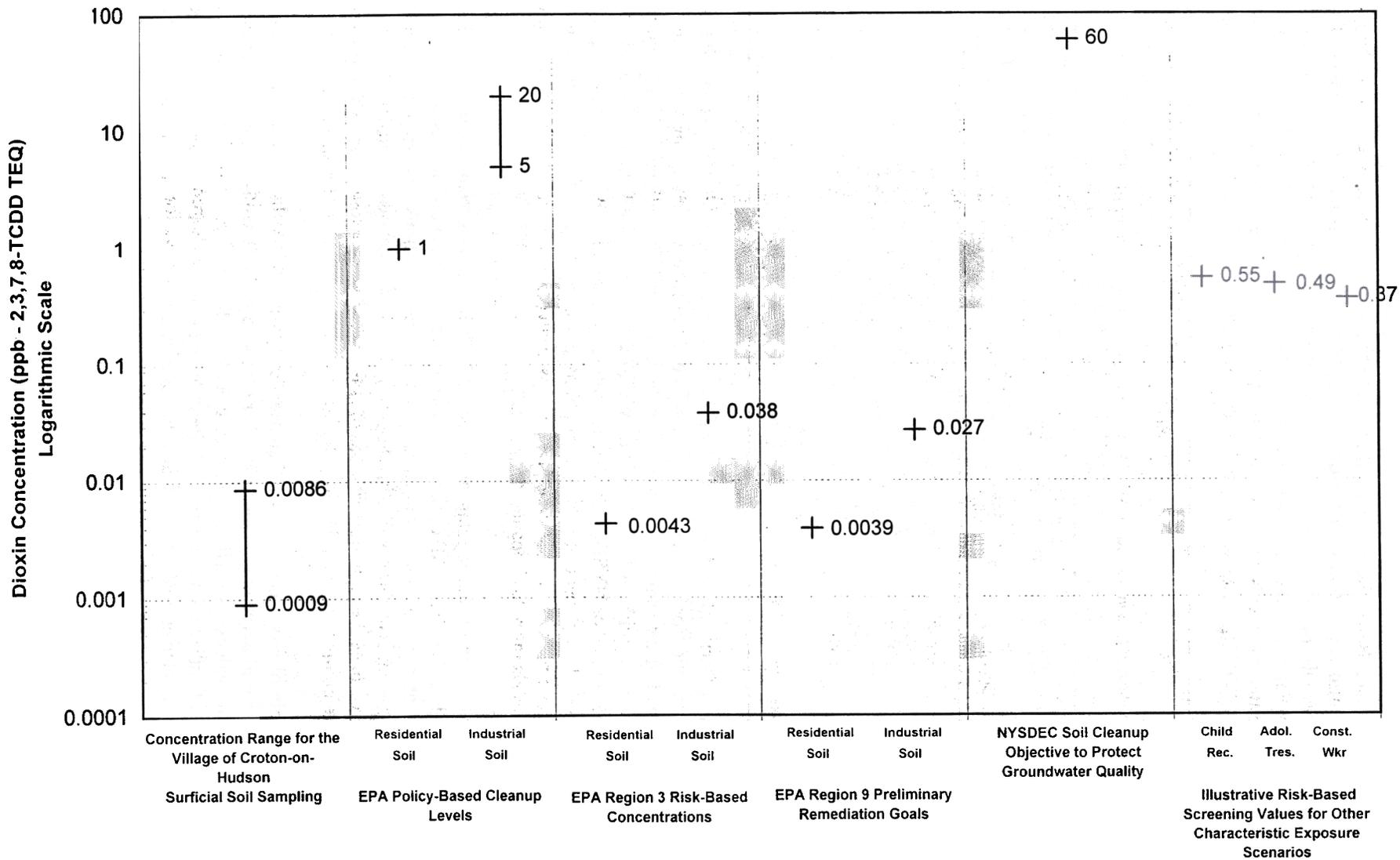
The village samples and regulatory policy and risk-based benchmark values are all shown on a common scale on Figure 6.2.6-2. All of the regulatory values are based on long-term (i.e., 25 to 30 years) exposure to soils at the published concentrations. Shorter durations of exposure would lead to a proportionally higher concentration of dioxin-like compounds in soil being associated with a given target risk goal. In other words, since the regulatory risk-based criteria are based on long-term exposure, a much higher level of dioxin-like compounds would need to be present for the same risk for short-term exposure.

An example of risk-based levels for shorter-term exposure is shown on Figure 6.2.6.1-2 as the "Illustrative Risk-Based Screening Values for Other Characteristic Exposure Scenario." These additional risk-based screening values for surficial soil were calculated for other types of land use involving shorter durations of exposure at a contaminated waste site in New England.<sup>25/</sup> These risk-based screening values are based on an excess cancer risk of  $1 \times 10^{-6}$  and the following exposure assumptions:

<sup>25/</sup>

Risk-based Benchmark Assessment Values calculated for the Silresim Superfund Site, Lowell, MA, 2001

**Figure 6.2.6-2**  
**Comparison of Croton-on-Hudson Surficial Soil Sampling Results**  
**with Established Risk-Based Criteria**



<u>Potentially Exposed Receptor</u>	<u>Hours per Day of Exposure</u>	<u>Days per Year of Exposure</u>	<u>Years of Exposure</u>	<u>Surficial Soil Risk-Based Screening Value (ppb 2,3,7,8-TCDD TEQ)</u>
Construction Worker	8	130		0.37
Adolescent Trespasser	2	120	12	0.49
Child Recreator	5	40	7	0.55

If similar calculations were completed for 2,3,7,8-TCDD TEQ on the ConEd right-of-way for the actual short-term exposure (1 to 3 months) associated with pipeline construction, these calculations would show an even higher screening value. Further, since the herbicides were applied to the surface and 2,4-D, 2,3,5-T, and 2,3,7,8-TCDD all tend to bind strongly to soil, they would not be likely to migrate below the first 6 inches of soil.<sup>26/</sup> Thus, the concentration of any dioxins present in the surface of the soil would be diluted by the soils excavated for the 5 to 6 foot trench.

Finally, when measuring dioxin levels, it is important to distinguish between site-specific dioxin levels and regional background levels since 2,3,7,8-TCDD can be found in small concentrations everywhere. Surface soil samples taken within the ConEd right-of-way would exhibit a dioxin concentration that reflects the regional influence, the residuals of past herbicide use, and possibly deposition from local sources. While we found no data on regional levels of 2,3,7,8-TCDD for Westchester County, New York, it is likely that the village samples are representative of background levels as no major sources of dioxin or furan emissions and deposition are known to be in the area.

Regardless of 2,3,7,8-TCDD persistency in the soil, the herbicides 2,4-D and 2,4,5-T have not been used on the cleared portions of the ConEd right-of-way for 20 years. Even considering the effective averaging of Millennium's samples due to the compositing and the seemingly unnecessary increase of the sample detection limits by a factor of 10 as the result of dilution of the samples by the lab (the village reported its results in parts per trillion), the maximum levels measured by both parties for 2,4-D and 2,4,5-T were not above the regulatory, health-based screening values for cleanup. In fact, the highest concentration of 2,3,7,8-TCDD TEQ reported in the village samples was below EPA policy-based residential cleanup levels of 1 ppb by a factor of 116.

Therefore, based on our review of established regulatory guidelines, the properties of 2,3,7,8-TCDD, and sampling conducted to date, we do not believe that pipeline construction activities within the ConEd right-of-way would result in significant exposures of dioxins to nearby residents. Our conclusion takes into consideration the following:

All samples of the ConEd right-of-way collected by Millennium showed levels of the residual herbicides 2,4-D and 2,4,5-T that were well below regulatory guidelines for cleanup;

All samples collected by the village from areas adjacent to the ConEd right-of-way showed levels of 2,3,7,8-TCDD that were well below regulatory guidelines for cleanup;

ConEd states that herbicides were only applied to the cleared portions of its right-of-way and not on adjacent undisturbed areas that would be used for installation of the pipeline;

<sup>26/</sup> National Primary Drinking Water Regulations Technical Factsheet on DIOXIN (2,3,7,8-TCDD), <http://www.epa.gov/safewater/dwh/t-soc/dioxin.html>; <http://toxnet.nlm.nih.gov> search using Hazardous Substance Data Bank

Use of herbicides (such as 2,4-D and 2,4,5-T) that contained high concentrations of 2,3,7,8-TCDD was suspended by the EPA in 1979; and

Even if 2,3,7,8-TCDD is present within those portions of the ConEd right-of-way that would be used for installation of the pipeline in concentrations higher than those found by Millennium or the village, there is no evidence to suspect that these concentrations would be high enough to constitute a health hazard considering the extremely short period (1 to 3 months) of exposure.

Since both of the herbicides and 2,3,7,8-TCDD are known to bind tightly to soil particles, leaching, groundwater transport, and volatilization are not typically significant migration routes for these compounds. There would, therefore, be no impact to groundwater sources from construction activities. Further, proper installation of erosion control measures would ensure that soil would not migrate to nearby surface waters. Lastly, routine dust suppression, particularly during initial grading activities and vehicle movement along the construction right-of-way, would limit migration of fugitive dust.

### Recreation Areas and Trail Crossings

Table 6.2.6.1-9 lists each identified recreation or public interest area crossed by the ConEd Offset/Taconic Parkway Alternative and acreage affected within each property.

County	Approximate Alternative MP	Area Name	Length (ft) Crossed or Adjacent	Acres Affected by Construction
Westchester	0.0 - 0.1	Westchester - Putnam Boy Scouts of America	315	0.9
	1.8 - 2.1	Brinton Brook Sanctuary - Saw Mill River Chapter, National Audubon Society	1,275	0.7
	2.2 - 2.3	Hudson National Golf Course	425	0.5
	2.4	Hudson National Golf Course	300	1.0
	2.5 - 2.7 <sup>a/</sup>	Village of Croton-on-Hudson, Jane E. Lytle Memorial Arboretum	650	0.4
	3.7 - 3.9	Village of Croton-on-Hudson	830	2.0
	3.9 - 4.0	Westchester County Land	550	1.2
	4.0 - 4.0	Taconic State Park Commission, Old Croton Aqueduct	110	0.2
	4.3 - 4.5	Westchester County Park Commission, Stokes - Greene Park	1,155	2.6
	4.8 - 6.2	Teatown Lake Reservation	7,130	10.5
	7.6 - 13.3	Taconic State Park Commission, Taconic State Parkway	30,200	51.5
8.8 - 9.5	Westchester County Park Commission, North County Trail	3,760	4.2	

<sup>a/</sup> Within the segment (MPs 2.7. to 3.2) where pipeline would be moved 35 feet closer to the ConEd powerline.

Except as discussed below, Millennium has not yet identified specific mitigation for these crossings and would develop mitigation during final easement negotiations. While use of the proposed mitigation would reduce short-term and long-term impact of the pipeline on the recreational and public interest areas crossed, Millennium should develop final construction and restoration plans with the landowners or land managers of properties crossed by the pipeline. Therefore, we recommend:

- **Before construction, Millennium should file with the Secretary all mitigation plans for construction of the pipeline and restoration of the construction right-of-way developed with the property owners or land managers identified on table 6.2.6.1-9 on the ConEd Offset/Taconic Parkway Alternative.**

Of the areas listed above, we received comments on the Brinton Brook Sanctuary, Jane E. Lytle Memorial Arboretum, and the Teatown Lake Reservation.

#### Brinton Brook Sanctuary

The Brinton Brook Sanctuary is owned and/or administered by the Saw Mill River Chapter of the National Audubon Society for passive recreation and bird watching. The sanctuary includes a parcel of land owned by the Village of Croton-on-Hudson, as well as land owned by the Saw Mill River Chapter of the National Audubon Society. The ConEd Offset/Taconic Parkway Alternative would be adjacent to the north boundary of the sanctuary between Alternative MPs 1.8 and 2.1. Construction would remove trees from within the ConEd right-of-way adjacent to the sanctuary, and from a parcel (about 400 feet long) owned by the village. About 0.7 acre of trees would be cleared from this parcel.

#### Jane E. Lytle Memorial Arboretum

The Jane E. Lytle Memorial Arboretum is located on a property owned by the Village of Croton-on-Hudson that encroaches into the ConEd right-of-way. The ConEd Offset/Taconic Parkway Alternative would cross the Jane E. Lytle Memorial Arboretum between Alternative MPs 2.5 and 2.7. Improvements within the arboretum include a graveled parking area and a trail system. The trail system is used for education and passive recreation, and includes a loop trail that surrounds the outer edge of a wetland area and several side-spur trails along the west and north portions of the arboretum. Concerns about construction through the arboretum are primarily associated with wetland W08CT discussed above and the loop trail discussed below.

Originally, about 340 feet of the side-spur trail would be within the ConEd Offset/Taconic Parkway Alternative construction work area. This area would have been cleared during construction and a majority of the trail would have been within the permanent right-of-way. However, since Millennium and the PSCNY have agreed to allow the pipeline to be placed 35 feet closer to the conductors, most of the trail may be avoided. Millennium would complete construction across the trail in a manner consistent with its ECS (section II.G) as described in Trail Crossings below and would coordinate with the arboretum about public access to the side-spur trail if it is affected during construction. Millennium would notify arboretum representatives in advance of construction activities and would construct through the arboretum as a single construction entity, which would limit construction activity to a period of about 2 weeks or less. Millennium has initiated discussions with the arboretum about post-construction restoration and believes that the use of appropriate shrub and tree plantings should accelerate restoration of the area. See section 6.2.6.1, Wetlands, for additional explanation and recommendations concerning construction in or near the arboretum.

### Teatown Lake Reservation

The Teatown Lake Reservation would be crossed between Alternative MPs 4.8 and 6.2, along the ConEd right-of-way. The Teatown Lake Reservation is a 733-acre nature preserve within the Croton River watershed that includes wetlands, streams, a 33-acre lake, and trails. There are over 3,000 environmental education programs per year and over 30,000 people visit the preserve each year to walk the trails, or attend the numerous school, weekend, and evening programs. We received a large number of comment letters regarding impacts on the reservation including loss of trees, impacts on the educational programs, and disruption of the native habitats and wildlife species.

The primary construction-related impacts on the Teatown Lake Reservation would be associated with clearing of mature trees within the construction work area and closure of some trails during construction. Construction activities would occur within a 50-foot-wide construction right-of-way and at two small staging areas previously described (see Wetlands above). Clearing of trees within the construction work areas would affect the view from some of the trails within the reservation until the forest regenerates, a long-term or permanent impact. However, several of the affected trails within the reservation are currently within the ConEd transmission line right-of-way.

The construction work areas for the ConEd Offset/Taconic Parkway Alternative would be about 1,500 feet from the reservation education center. Due to local topography and the location of the proposed route through the reservation, general construction activities and/or the permanent right-of-way would not be visible from the education center. However, construction activities associated with the crossing of Teatown Lake would be visible from the education center. In response to concerns about laying the pipeline on the bottom of this shallow lake, Millennium would bury the pipeline, rather than lay it on the lake bottom, and use sediment curtains to minimize turbidity. Millennium would fence the construction work area and install appropriate signage to ensure that the construction work area would not be accessible from the trail system within the Teatown Lake Reservation. Millennium would work with reservation representatives to identify trails that should be posted for closure as construction activities progress through the reservation.

While these proposed mitigation measures would help to minimize impact on the Teatown Lake Reservation, we believe that construction should be completed as quickly as possible and at times that would have the least impact on educational programs. Therefore, we recommend that:

- Millennium should prepare a detailed construction and restoration plan for construction through the Teatown Lake Reservation (Alternative MPs 4.8 through 6.2). This plan should be developed in consultation with the Teatown Lake Reservation and include provisions to complete construction activities (grading through restoration) at one time in the shortest time possible. Millennium should file with the Secretary the final, site-specific plan that describes timing of construction and measures that would be implemented before and after construction, and includes scaled drawings identifying areas that would be disturbed within the reservation and plans for restoration plantings and reseeded within the construction work area.**

### Trail Crossings

Table 6.2.6.1-10 lists the trails that would be crossed by the ConEd Offset/Taconic Parkway Alternative. In accordance with its ECS, Millennium would maintain safe and uninterrupted passage on all trails crossed by the pipeline, where possible. Standard crossing procedures would involve posting warning signs, installing protective safety fencing, leaving trench plugs or installing other bridging devices over the trench, and completing construction through the area as quickly as possible. Millennium would not excavate the trench until the pipe is ready for installation and would not leave the trench open within 100 feet of the

trail crossing. Site-specific plans would be developed with the land managers as part of overall mitigation for crossing of the properties (see discussion above for recreation areas).

TABLE 6.2.6.1-10

## Trails Crossed by the ConEd Offset/Taconic Parkway Alternative

Approximate Alternative MP	Trail Name	Length of Trail Affected During Construction (ft)
1.8 - 2.1	Brinton Brook Sanctuary	
2.0	Bird Sanctuary Trail	125
2.2 - 2.3, 2.4	Hudson National Golf Course	
2.2	Highland Trail	500
2.4	Unnamed Trail	75
2.5 - 2.7	Jane E. Lytle Memorial Arboretum	
2.6	Arboretum Spur Trail	340 (adjacent)
4.0	Taconic State Park Commission	
4.0	Croton Gorge Park Trail	75
4.0	Old Croton Aqueduct Trail	75
4.0	Croton Gorge Park Trail	80
4.8 - 6.2	Teatown Lake Reservation	
5.0	Cliffdale/Teatown Trail	175
5.1	Unnamed Trail	75
5.2	Unnamed Trail	75
5.5	Northwest Trail	75
5.5	Unnamed Trail	75
5.6	Lakeside Trail	200
5.7	Lakeside Trail	75
5.9	Back 40 Trail	75
5.9	Unnamed Trail	75
6.2	Back 40 Trail	75
6.3	Unnamed Trail	75
	Westchester County Park Commission	
8.1	North County Trail	75
8.8 - 9.5	North County Trail	3,760

## Visual Resources

Most of the residences adjacent to the ConEd Offset portion of the alternative are on forested lots that are augmented by the portion of the ConEd right-of-way that has remained forested. Therefore, the primary impact on these residences would be the removal of mature trees, many of which provide a visual screen from the ConEd transmission line. Millennium identified six areas along the ConEd Offset/Taconic Parkway Alternative where mature trees would be removed adjacent to residences. These areas are located between Alternative MPs 0.5 and 0.6, MPs 0.7 and 1.0, MPs 1.0 and 1.1, MPs 2.7 and 2.8, MPs 3.1 and 3.2, and MPs 7.1 and 7.2. Where possible, Millennium would attempt to reduce the construction work area or relocate the pipeline more than 50 feet from residences. For areas where construction would be within 50 feet of a residence, Millennium would attempt to avoid removal of mature trees and landscaping.

The PSCNY has agreed to allow the pipeline to be 35 feet closer to its conductors at three locations along the ConEd Offset/Taconic Parkway Alternative: the Westminster/Watch Hill area (Alternative MPs 0.5 to 1.2), the Jane E. Lytle Arboretum/Hessian Hills area (Alternative MPs 2.4 to 3.2), and along a strip of land (Alternative MPs 7.0 to 7.2). This would allow a larger number of the mature trees to be retained in these areas.

Within the Teatown Lake Reservation, Millennium would minimize viewshed impacts by utilizing a sinuous pipeline route north of Teatown Lake. This route would avoid major rock outcrops and other scenic resources in the area. The avoidance of rock outcrops would also reduce the need for blasting within the Teatown Lake Reservation during trenching. The sinuous nature of the proposed pipeline route would prevent visibility of a linear operational right-of-way from points within the Teatown Lake Reservation south of Teatown Lake.

### **Cultural Resources**

Millennium conducted a cultural resource survey of the ConEd Offset/Taconic Parkway Alternative. About 97 percent of the right-of-way was surveyed, resulting in the identification of 20 archeological and/or architectural resources and the redefinition of 3 previously recorded sites. Additional recommended work includes: the development of a site-specific crossing work plan for the Old Croton Aqueduct, further documentation to determine the eligibility of the Biddle residence, and additional testing at 4 sites. Two other sites would only require further work if the project would affect one or more major elements of the sites. Currently, the project only affects the stone boundary walls. To ensure that the Commission's responsibility under section 106 of the NHPA and its implementing regulations are met, we have recommended that Millennium defer construction until all additional cultural resources surveys and evaluation reports, any required treatment plans, and the appropriate SHPO's comments on the reports and plans have been filed for review and approval by the Director of OEP (see section 5.9.2). This recommendation would also apply to the ConEd Offset/Taconic Parkway Alternative.

### **Alternatives**

Commenters on the ConEd Offset/Taconic Parkway Alternative identified two route variations for consideration: the State Route 134 and Taconic State Parkway East Variations. One major route alternative (the Route 117 Alternative) is discussed in section 3.6.1 of this FEIS.

#### State Route 134 Variation

The State Route 134 Variation was suggested to avoid residences near Alternative MP 7.1 and take advantage of the potential route to the IBM facility (see figure 2.6.1-1). The variation would leave the ConEd Offset/Taconic Parkway Alternative at Alternative MP 6.5, would turn northeast along State Route 134 to the Taconic State Parkway and then turn south along the west side of the Taconic State Parkway and the east side of Still Lake, to rejoin the proposed route at Alternative MP 7.6. The variation would be about 1.4 miles longer than the ConEd Offset/Taconic Parkway Alternative and would require construction adjacent to residences along State Route 134. We identified no environmental advantages with the variation and do not recommend its use.

#### Taconic State Parkway East Variation

The Taconic State Parkway East Variation was identified by several commenters in the Village of Briarcliff Manor to increase the distance between the pipeline and the Todd Elementary School, as well as 26 residences located along the west side of the Taconic State Parkway on Larch Road south of Pleasantville Road (Alternative MP 10.9). The residences are protected from the parkway by a sound barrier fence and by the cleared area along the parkway. None of these residences would be within 50 feet of the construction work areas. The variation would leave the ConEd Offset/Taconic Parkway Alternative at Alternative MP 10.7, cross to the east (northbound) side of the Taconic State Parkway, and continue on the east side to a point between 200 and 300 feet north of the ConEd powerline crossing of the Taconic State Parkway. At that point, the variation would cross back to the west side of the parkway to rejoin the proposed route at Alternative MP 11.4.

The Taconic State Parkway East Variation would increase the distance between the pipeline and the Todd Elementary School, and would avoid a sewer line that is about 25 feet from southbound lane of the Taconic State Parkway between approximate Alternative MPs 10.5 and 11.0 (Pleasantville Road). However, it would require construction along the Pocantico River tributary and require a total of up to 3 stream crossings (versus 1 for the alternative). The variation would also include a crossing of a large forested wetland located south of Pleasantville Road. Based on NWI maps, the crossing would be up to 750 feet long. The alternative would cross a total of 515 feet of open water and emergent wetlands. It would also require two additional crossings of the Taconic State Parkway and construction about 200 feet closer to the ConEd right-of-way.

We believe that the additional safety measures mandated by the PSCNY would also provide an extra level of protection for the school and residences along Larch Road. Since we found no clear environmental advantage to this variation and it could affect residences on the east side of the parkway, we do not recommend its use.

However, to ensure that installation of the pipeline would not interfere with the sewer line or cause the pipeline to be located any closer to the Todd Elementary School, we recommend that:

- Before construction, Millennium should file with the Secretary a dimensioned site-specific plan of the pipeline between approximate Alternative MPs 10.5 and 11.0 of the ConEd Offset/Taconic Parkway Alternative for review and written approval by the Director of OEP. This plan should show the location of the pipeline, and construction work areas, in relation to the sewer line and Todd Elementary School.**

#### 6.2.6.2 Comparison of the State Route 100 and Taconic State Parkway Segments

The ConEd Offset/State Route 100 Alternative was identified to move Millennium's pipeline from its original route (between the ConEd's powerline structures) to one adjacent to (and 100 feet from) the ConEd structures and then along State Route 100 between MPs 391.9 and 401.4 of the 9/9A Proposal. This alternative was analyzed in the SDEIS. The ConEd Offset/Taconic Parkway Alternative was identified by the Villages of Briarcliff Manor, Croton-on-Hudson, and Ossining, New York, and the Town of Ossining, New York. It would also follow the ConEd right-of-way from MP 391.9; however, at MP 399.0A rather than following State Route 100 it would follow the Taconic State Parkway to MP 404.5. An environmental analysis of this alternative is in the previous section.

Since the segment along the ConEd right-of-way is common to both the ConEd Offset/State Route 100 and ConEd Offset/Taconic Parkway Alternative, we did not include the ConEd segment in our analysis below and only compare the State Route 100 and Taconic State Parkway segments. The comparison of environmental characteristics is in table 6.2.6.2-1. The Taconic State Parkway segment would be about 0.2 mile shorter than the State Route 100 segment, would cross 3 fewer waterbodies, and affect 1.8 fewer acres of wetlands. The State Route 100 segment would affect 8.7 fewer acres during construction, since it would mostly be constructed within the bicycle path within a 35-foot-wide construction right-of-way. The construction work area for neither segment would be within 50 feet of residences.

TABLE 6.2.6.2-1

## Comparison of the State Route 100 and Taconic State Parkway Segments

Milepost/ Environmental Factor	Unit	State Route 100	Taconic State Parkway
<b>MPs 399.0A to 404.5</b>			
• Total length	mi.	5.4	5.2
• Total length within or adjacent to resting rights-of-way	mi.	5.4	5.1
• Estimated land required for construction <u>a/</u>	ac.	23.0	31.7
• Estimated land required for operation <u>b/</u>	ac.	32.8	31.8
• Total waterbody crossings	no.	5	2
• Wetlands affected	ac.	2.3	0.5
• Residences within 50 feet of the construction work area	no.	0	0

a/ Construction acreage based on an average width of between 30 and 60 feet.  
b/ Assumes a 50-foot-wide right-of-way.

Disadvantages of State Route 100 segment include the crossing of about 0.4 mile of NYSDEC regulated wetland O-14 along the North County Trail near Chappaqua Road to avoid a sewer line that occupies the North County Trail right-of-way. Another disadvantage would be associated with construction within the southbound lane of State Routes 9A/100 between approximate MPs 401.4 and 404.5 (a distance of 3.1 miles). The primary advantages of the Taconic State Parkway segment are that it would reduce impact on wetlands, cross 3 fewer waterbodies, and affect 1.0 acre less land for operation. Because this segment would mostly be constructed within the “cleared area” adjacent to the parkway, it should have less impacts on traffic and less impact on the bicycle trail. However, the Taconic State Parkway segment would require closure of one of the three southbound lanes for the majority of its length.

**Because the Taconic State Parkway segment would cause less environmental impact than the State Route 100 segment, particularly on wetlands, waterbodies, and the bicycle trail, we recommend its use.**

### 6.2.6.3 Comparison of the ConEd Offset/Taconic Parkway Alternative with the 9/9A Proposal

Both the 9/9A Proposal and the ConEd Offset/Taconic Parkway Alternative would leave Millennium’s proposed route at MP 391.9 and continue in a general southeasterly direction for about 13.3 miles (see figure 6.2.6-1). The 9/9A Proposal would parallel, or be adjacent to or within, existing utility or transportation corridors including U.S. Route 9, State Route 9A, State Routes 9A/100, bicycle paths (e.g., Briarcliff-Peekskill Trailway), and the ConEd powerline right-of-way. The ConEd Offset/Taconic Parkway Alternative would be adjacent to and within the existing ConEd and Taconic State Parkway rights-of-way. Both pipeline routes would rejoin the proposed route at MP 404.5.

The 9/9A Proposal and the ConEd Offset/Taconic Parkway Alternative would be adjacent to or within existing rights-of-way for nearly 100 percent of their respective lengths (see table 6.2.6.3-1). In comparison to the 9/9A Proposal, the ConEd Offset/Taconic Parkway Alternative would affect 88.8 acres more land during construction and 24.2 acres more land during operation, and would cross 1 more waterbody and 15 more wetlands. The 9/9A Proposal would require construction within U.S. Route 9 for 2.1 miles, State Route 9A for 4.3 miles, and State Routes 9A/100 for 2.4 miles. This would require closure of one lane

of these roads during installation of the pipeline. The construction work area for the 9/9A Proposal would also be within 50 feet of two more residences and five businesses.

TABLE 6.2.6.3-1

**Comparison of the ConEd Offset/Taconic Parkway Alternative  
with the Corresponding Segment of the 9/9A Proposal**

Milepost/ Environmental Factor	Unit	9/9A Proposal	ConEd Offset/Taconic Parkway Alternative
<b>MPs 391.9 to 404.5</b>			
• Total length	mi.	13.3	13.3
• Total length within or adjacent to existing rights-of-way	mi.	13.3	13.3
• Total length along the ConEd right-of-way	mi.	1.8 <u>a/</u>	7.8
• Total length along highways	mi.	8.8	5.5
• Estimated land required for construction <u>b/</u>	ac.	79.8	168.6
• Estimated land required for operation	ac.	56.4	80.6
• Total waterbody crossings	no.	16	17
Less than 10 feet wide	no.	12	12
Between 11 and 50 feet wide	no.	2	2
Between 50 and 100 feet wide	no.	1	1
Over 100 feet wide	no.	1	2
• Wetlands crossed	no.	6	21
• Wetlands affected	ac.	2.4	4.0
• Businesses within 50 feet of the construction work area	no.	5	0
• Residences within 50 feet of the construction work area	no.	4	2
• Residences within 200 feet of the construction work area	no.	101	59
 <u>a/</u> The 9/9A Proposal would parallel the ConEd powerline right-of-way between MPs 402.7 and 404.5 for 1.8 miles and would cross the ConEd powerline right-of-way at MPs 402.7.			
<u>b/</u> Construction acreage based on an average width of 49.5 feet for the 9/9A Proposal and between 30 and 60 feet for the ConEd Offset/Taconic Parkway Alternative.			

The most significant disadvantages of the 9/9A Proposal would be its effect on the built environment (e.g., highways, residences, and businesses). Impacts associated with construction include traffic disruptions on U.S. Route 9, State Route 9A, and State Routes 9A and 100, a major north-south transportation corridor; and disturbance to residents and businesses that are adjacent to the construction right-of-way, especially in Croton-On-Hudson, Ossining, and Briarcliff Manor. The 9/9A Proposal would affect the least amount of land and wetlands, and would cross the fewest waterbodies. However, we recognize that pipeline construction along U.S. Route 9, State Route 9A, and State Routes 9A/100 would cause an inconvenience and traffic delays even though Millennium would install its pipeline along the edge of these roadways and in compliance with traffic control and maintenance plans that would be prepared in consultation with the NYSDOT.

The major advantage of the ConEd Offset/Taconic Parkway Alternative would be that it would avoid the need to shut down one lane along 8.8 miles of U.S. Route 9, State Route 9A, and State Routes 9A/100, portions of which are part of the evacuation route for the Indian Point Nuclear Power Plant. Construction activities along the Taconic State Parkway would be conducted within a “clear zone” for about 5.5 miles adjacent to the parkway and along the road shoulder. This “clear zone” is about 15 to 20 feet wide and as much as 60 feet wide in some areas beyond the breakdown lane. By comparison, most of the segment along

State Route 9A of the 9/9A Proposal has an estimated “clear zone” of 15 feet that includes the breakdown lane if it is present. Therefore, although installation of the pipeline adjacent to the Taconic State Parkway may require the closing down of one lane of southbound traffic for equipment staging, it would not be required along the entire 5.5-mile-long segment adjacent to the parkway. In addition, whereas residential and commercial development is built right-up the edge of U.S. Route 9 and State Route 9A in most locations in Croton-on-Hudson, Ossining, and Briarcliff Manor, this development is less prevalent along the Taconic State Parkway and generally at a greater distance from the highway. Finally, this segment of the Taconic State Parkway is a limited access highway with no grade crossings or traffic signals, or truck traffic (an issue on the 9/9A Proposal).

The major disadvantages of the ConEd Offset/Taconic Parkway Alternative are that it would require removal or a reduction of tree screening between residences abutting the ConEd powerline corridor, it would be nearer to ConEd for a greater distance, and it would be adjacent to a sewer line north of Larch Road. Additionally, it would be adjacent to the Brinton Brook Sanctuary and Jane E. Lytle Arboretum, and would cross the Teatown Lake Reservation. Further, residents in the Larch Road area in Mount Pleasant remain concerned about the proximity of the pipeline to the Todd Elementary and Briarcliff Manor Middle and High Schools and 28 residences on Larch Road (Alternative MPs 10.5 to 11.5). However, the nearest residences would be greater than 50 feet from the construction work area. By comparison, the construction work area for the 9/9A Proposal would cross through the center of Croton-on-Hudson, and residential developments in Ossining and Briarcliff Manor.

There is no clear advantage of one route over the other since they would affect different resources and neither route is popular with the people who would be affected by its construction. Either route could be constructed with some changes to reduce impacts. However, the ConEd Offset/Taconic Parkway Alternative has the advantage of co-locating two utility rights-of-way for over half of its length, rather than imposing a new utility within a narrow transportation corridor. Further, Millennium and the PSCNY have agreed to stringent safety specifications which would be part of the design and operation of the pipeline and would allow Millennium to install the pipeline closer to the powerlines to take greater advantage of the existing cleared right-of-way, thus minimizing tree clearing in sensitive areas. **Therefore, based on the filed comments and our analysis, the ConEd Offset/Taconic Parkway Alternative is preferred over the 9/9A Proposal and we recommend it to the Commission.**