APPENDIX J

MILLENNIUM PIPELINE PROJECT - NEW YORK COASTAL ZONE MANAGEMENT POLICY CONSISTENCY DETERMINATION

March 2001

EXECUTIVE SUMMARY

The Millennium Pipeline Project: Background

The Millennium Pipeline Project (the "Project") consists of 442 miles of underground natural gas pipeline extending from an interconnection in Lake Erie at the Canada/United States ("U.S.") border, through southern New York, to Mount Vernon, New York. The pipeline system will traverse the floor of Lake Erie, twelve New York State counties, and the Hudson River at Haverstraw Bay. The Project represents a $650 million capital investment in New York State's energy future, and will be capable of transporting enough natural gas to supply 2.1 million homes per annum.

The need for the Project is clear, as the Public Service Commission of the State of New York has found. The infrastructure associated with the Project will allow the plentiful natural gas reserves in the U.S. and Canada to be economically supplied where it is critically needed by customers in the northeastern U.S. Moreover, the clean, efficient and cost-effective energy supplied by the Project will have the additional societal benefit of reducing the northeastern U.S.'s dependence on coal and oil fired fuel-burning power plants with significant environmental benefits - a potential reduction of SO_2 emissions by 235,000 tons and No_x emissions by more than 55,000 tons each year.

Potential environmental impacts of the Project are being reviewed in accordance with the National Environmental Policy Act ("NEPA") under the federal permitting process implemented by the Federal Energy Regulatory Commission ("FERC"). In April 1999, the FERC issued a Draft Environmental Impact Statement ("DEIS"). Therein, the FERC Staff concluded that the Project would be environmentally acceptable if constructed and operated in accord with mitigation measures outlined in the DEIS. That determination notwithstanding, Millennium Pipeline Company, L.P. ("Millennium") further refined the Project to minimize potential environmental impacts, which impacts are anticipated to occur only in the construction phase. Millennium committed to constructing the Project in the most environmentally sensitive manner possible by, inter alia, (1) utilizing existing utility corridors for more than 86% of the pipeline's length; (2) engaging in vigorous right-of-way restoration and reconstruction programs; and (3) utilizing low impact stream crossing techniques and employing mitigation measures that minimize impacts on aquatic ecosystems.

Following project refinements and route revisions to address concerns in Westchester County, the FERC Staff issued in January of 2001 a Biological Assessment under the Endangered Species Act and an Essential Fish Habitat Assessment under the Magnuson – Stevens Fishery Conservation and Management Act. The FERC Staff also issued a Supplemental Draft Environmental Impact Statement ("SDEIS") in March of 2001. Those documents resoundingly support Millennium's route selection and the efforts of Millennium to

reduce environmental impacts for the entire project and, specifically, those portions of the project in the coastal zone, including the crossing of the Hudson River at Haverstraw Bay.

Despite these project refinements, and the use of existing utility corridors and easements for all but 14% of the pipeline's length, sections of the Project still fall within the coastal zone boundary of New York State. Specifically, the Project's proposed Hudson River crossing at Haverstraw Bay, certain portions of the Project in the Village of Croton-on-Hudson, including the crossing of the Croton River, and the Lake Erie landing at Ripley, New York, are within New York State's coastal zone. Under federal and state law, this necessitates an evaluation of the Project's impact on New York's coastal zone resources.

II. Coastal Zone Management Regulatory Program

The Federal Coastal Zone Management Act ("CZMA") of 1972 was enacted by Congress to balance the competing demands of development with the need to protect coastal resources. The primary means of achieving this balance is through coastal zone management programs adopted by the states. The CZMA requires that state management programs be consistent with national CZMA policies, including (1) accommodating the need for compatible economic development in coastal zones; and (2) giving "priority consideration" to siting coastal-dependent uses such as major energy facilities.

In 1981, New York State adopted the Waterfront Revitalization and Coastal Resources Act, creating the New York State Coastal Management Program ("CMP"). The CMP received federal approval in 1982; thereby, New York State was authorized to implement the federal CZMA through the CMP. The CMP contains 44 policy statements which are applied to projects to determine "consistency" with the state's coastal management program; the initial determination is made by applicants proposing projects or activities in the Coastal Zone, subject to concurrence or rejection by the New York Department of State. Further, in accord with the CZMA, New York State has defined its coastal zone boundaries. Where, as here, projects (or sections thereof) fall within these boundaries, the policies of the CMP apply, and the projects' consistency with the CMP must be evaluated.

III. Coastal Zone Management Policy Consistency Determination

As noted above, three sections of the Project fall within the coastal zone boundaries of New York State: (1) the Hudson River crossing at Haverstraw Bay; (2) portions of the Village of Croton-on-Hudson, including the Croton River crossing; and (3) the Lake Erie crossing. Each of these sections of the Project is consistent with the CMP.

A. Hudson River - Haverstraw Bay

The most significant aspect of the CMP consistency evaluation respecting the Hudson River crossing at Haverstraw Bay concerns CMP policy #7. This policy directs that "significant coastal fish and wildlife habitats [ ] be protected, preserved, and where practical,

restored so as to maintain their viability as habitats." The Hudson River-Haverstraw Bay crossing emerged as an issue because Haverstraw Bay is designated as a significant coastal fish and wildlife habitat under the CMP. While alternative routing was evaluated several times, these evaluations repeatedly and uniformly demonstrated that the Haverstraw Bay route is the only feasible alternative.

Under state guidance documents, consistency with policy #7 devolves to satisfying the "habitat impairment test": namely, an action is consistent so long as it does not "destroy the habitat; or, significantly impair the viability of a habitat." The Hudson River-Haverstraw Bay route satisfies both prongs of the test because of: (1) the innovative, low impact excavation/construction technology (i.e., open-water lay barge method) being used on this section of the Project, combined with best management practices ("BMPs"), will result in only spatially localized, temporary disturbances of the substrate and water column; (2) the very small proportion of the contiguous functional habitat that would be affected by the pipeline footprint, namely 0.08%, with only 1.2% of the designated habitat being affected by the pipeline construction; (3) the low biological diversity in, and uniform nature of, the contiguous functional habitat, and (4) the presence of a biological community adapted to an estuarine environment subjected to periodic natural disturbances of the substrate and possessing the capability to rapidly recolonize disturbed areas

More specifically, the innovative lay barge technique involves excavating a trench (with a maximum of 1300 feet of trench open at one time) and stockpiling excavated river sediment in barges rather than on the river bottom. After the pipe is placed in the trench, backfilling will begin, so that the trench in any given area will not remain open for more than two weeks. Construction of the entire Haverstraw Bay crossing is anticipated to be complete within 2.5 months. Additionally, (1) BMPs will be used as necessary to further reduce the potential effects of construction; and (2) the construction will take place during a limited dredging window selected by resource agencies to minimize effects on aquatic life. Accordingly, the low-impact excavation/backfilling technology, the timing of the construction, and the staged nature of the construction will limit impacts to the physical habitat and biota.

In addition, the broad expanse of contiguous functional habitat beyond Haverstraw Bay assures that there will be no destruction of, or significant impairment to, habitat. This "functional habitat," which possesses high productivity, but low diversity, is relatively uniform spatially. The total footprint of the pipeline represents a minute percentage - - only 0.08% - - of the contiguous functional habitat. Thus, impacts to the ecosystem as a whole will be insignificant.

However, even confining the analysis solely to Haverstraw Bay, it is clear that the pipeline construction will cause no permanent, or significant, change in physical, chemical, or biological characteristics of the habitat and, hence, will be consistent with the CMP. Specifically as to physical impacts, the construction will have only short-term, localized effects. The construction will not affect tidal flow, which is the primary mechanism for controlling physical habitat and water quality in Haverstraw Bay. There will be no change in the shape of the river bottom after construction, and there will be no structures remaining in the water column. Due to

the shallow estuarine environment, tidal flow, river discharge, and wind/storm events will act to smooth out any small irregularities in the substrate after backfilling. While turbidity will be increased during excavation and backfilling of the trench, water quality will not be impaired to any significant degree. Indeed, this is demonstrated by the Clean Water Act Section 401 water quality certification, granted by the New York State Department of Environmental Conservation ("NYSDEC") for the Project. Effects from increased sedimentation during excavation and backfilling will be confined to the near vicinity of the trench. Tidal action will rapidly restore the bottom surface to stable condition.

Chemical effects on habitat, likewise, will be temporary and confined to the turbidity plume. No material will be added to, or removed from, the water or sediment during or after construction. Sediment testing demonstrated very low contaminant levels and no PCBs. Because the trench will be backfilled with the same sediment that is excavated, there will be little change, if any, in the composition of the sediments.

Biological impacts will be limited to short-term loss of benthic life and the temporary displacement of mobile aquatic life in the vicinity of the pipeline segment under construction. Fish and mobile invertebrates will avoid the immediate work area, although some may be attracted to the turbidity plume to capitalize on increased foraging opportunities. Construction will have no effect on migratory behavior, since the staged nature of the construction will leave the vast majority of the river width available for migration at any given time. The very small area of disturbance relative to the total habitat area and the rapid recovery of the functional value of that habitat assures that there will be no significant impacts to biota.

The pipeline construction will have far less impact on habitat than impacts that routinely occur from the natural processes to which Haverstraw Bay is subjected. Shallow estuaries, such as Haverstraw Bay, are commonly exposed to extremes of tidal flow and natural disturbances (i.e., coastal storms, river floods). Aquatic life is adapted to this type of environment and readily recovers from such disruption. Further, fine-grained estuarine sediments have been found to recover quickly from these types of disturbances, with recovery times for most benthic organisms commonly being no more than one year. The disturbances that will result from pipeline construction are similar in kind to those from natural forces, but will be limited to a very small area of the Bay. Accordingly, overall impact from the construction will be minimal.

Indeed, this conclusion is confirmed by empirical evidence respecting the periodic channel maintenance dredging of Haverstraw Bay. The navigation channel in Haverstraw Bay is maintained at a depth of 32 feet through the periodic removal of accumulated sediment. The channel was last dredged in 1986. Extensive sampling over the last three decades demonstrates that (1) fish and benthic communities have flourished since the navigation channel was built; and (2) important fish populations (e.g., shortnose sturgeon and striped bass) have expanded substantially. Given the far more extensive, and disruptive nature of maintenance dredging (as compared with the lay barge, phased construction technology at issue here), there can be no doubt that impacts associated with Project construction will not impair the significant coastal fish and wildlife habitat of Haverstraw Bay.

In summary, the construction activities will result in only temporary, localized disturbances of the habitat - - i.e., temporary loss of habitat and benthic organisms in creating the trench, minor sediment deposition in undisturbed benthic habitat adjacent to the trench, and short term increase in turbidity in the water column. There will be no destruction, or significant impairment, of habitat; the quantity and quality of the habitat after construction will be the same as pre-construction conditions. There will be no change in substrate type, water quality, or other physical/chemical characteristics; and no appreciable loss of, or damage to, biota in terms of overall populations in the benthos and water column. Hence, compliance with the CMP is assured.

B. Village of Croton-on-Hudson

There are two coastal zone issues related to the pipeline route through the Village of Croton-on-Hudson: (1) passing through the shoreline park on Haverstraw Bay; and (2) crossing the Croton River. The park is adjacent to the designated significant Coastal Fish and Wildlife Habitats of Haverstraw Bay, and the Croton River is part of another area with the same designation. The consistency determination respecting these crossings is subject to the coastal zone policies of the Village of Croton-on-Hudson's Local Waterfront Revitalization Program ("LWRP").

It is policy #7 of the LWRP (i.e., concerning the protection of significant coastal fish and wildlife habitat) that is of most import here. The LWRP divides policy #7 into seven subpolicies, five of which apply to the pipeline construction: that (1) the quality of the habitat be protected and improved and resources protected from pollution and misuse; (2) materials that could degrade water quality or harm the ecosystem not be disposed of, or allowed to influence, the habitat; (3) storage of potentially harmful materials not be permitted in the area of influence of the habitat unless best available technology is used to prevent adverse impacts; (4) construction not cause a measurable increase in erosion or flooding at the site, and that it be timed so as not to adversely affect anadromous fish; and (5) activities not cause degradation of water quality or impact identified significant habitats.

The Hudson shoreline and Croton River crossings plainly satisfy each of these subpolicies. First, there will be no harm to the quality of the habitat. The pipeline will pass close to the shore of Haverstraw Bay, but at no point will the construction encroach beyond the riverbank and into the water. The work area at the inland tidal pond and crossing of the tidal creek will create only a minor habitat disturbance. Both areas will be fully restored following completion of construction. The Croton River crossing will be by directional drilling under the river and adjacent wetlands. Drilling will originate upland from the riverbank and exit on the opposite shore well back from the bank, with all construction activities being confined to an abandoned roadway. Thus, the quality of the habitat will not be impaired, and the subject construction is, therefore, consistent with this subpolicy.

Likewise, there will be no degradation of water quality or harm to the ecosystem from the release of materials during the construction process. The directional drilling to be employed in the Croton River crossing involves the use of drilling mud within the borehole. All

drilling muds will be contained during and after construction and removed from the site when drilling is completed. A contingency plan will also be prepared to address handling and releases of drilling mud, sealing of abandoned drill holes, and clean up of inadvertent releases. Accordingly, there will be no degradation of water quality; thus, the construction is consistent with this subpolicy.

The subject construction is also consistent with the remaining subpolicies. Construction of the Croton River crossing and along the Hudson shoreline will utilize best available technology to contain all potentially harmful materials. By using best management practices, runoff/erosion will be controlled to the maximum extent practicable. No construction will occur within the water at either location; thus, the project cannot influence anadromous fish or shellfish. Finally, there will be no degradation of water quality. Accordingly, the subject construction is consistent, in all respects, with local policies protecting significant coastal fish and wildlife habitat, as well as with the remaining policies of the LWRP.

C. Lake Erie Crossing

The crossing of Lake Erie from Port Stanley, Ontario, to Ripley, New York, will consist of 93 miles of a concrete-coated pipeline in a trench excavated in the lakebed. A combination of construction techniques will be used to complete the construction, including (1) directional drilling in the near shore environment; and (2) laying the pipe by barge and trenching by jetting in the offshore areas. No significant coastal fish and wildlife habitat is implicated in the Lake Erie crossing; however, the construction is, nonetheless, designed to maintain the viability of existing habitat. The construction across Lake Erie will also comply with all remaining coastal zone policies, including (1) protecting coastal biota and resources from the introduction of hazardous waste of other harmful pollutants (i.e., by using best management practices for construction activities); (2) preventing interference with natural coastal processes (i.e., by using directional drilling in the near shore, limiting blasting of shale bedrock to short distances, and performing trench excavation by mechanical jetting at depths that will not affect the natural coastal processes); and (3) routing the pipeline so as not to impact archaeological or cultural resources.

IV. Conclusion

The Millennium Pipeline is a project of national import which is critical to the energy future of New York State and the entire northeastern U.S. The Project will supply clean, efficient and abundant energy to markets where it is needed. Environmental impacts from the Project will be minimized to the maximum extent practicable, and such impacts have been deemed to be acceptable under federal law. Effects from the Project on New York State's coastal zone, likewise, will be minimal and fully consistent with state and local coastal zone management policies. Accordingly, coastal zone management issues present no impediment to construction or operation of this Project.

MILLENNIUM PIPELINE PROJECT

NEW YORK STATE COASTAL ZONE CONSISTENCY DETERMINATION

1. REGULATORY AUTHORITY

The Coastal Zone Management Act (CZMA) of 1972 (16 U.S.C. § 1451 *et seq.*) was enacted by Congress to balance the competing demands of growth and development with the need to protect coastal resources. The stated policy behind this law is to ". . . preserve, protect, develop and, where possible to restore or enhance, the resources of the nation's coastal zone . . ." 16 U.S.C. § 1452(1). The primary means of achieving this balance is through coastal zone management programs adopted by the states and designed to regulate activities that could affect coastal areas. The CZMA offers incentives to encourage the coastal states and territories to exercise their full authority over coastal areas through development of coastal zone management programs, which are consistent with minimum federal standards. Indeed, the CZMA requires that state management programs be consistent with national CZMA policies, including (1) accommodating the need for compatible economic development in coastal zones; and (2) giving "priority consideration" to siting coastal-dependent uses such as major energy facilities. 16 U.S.C. §§ 1455(d)(1) & 1452 (2)(D); 15 C.F.R. § 923.52; see also 16 U.S.C. §§ 1455(d)(2) & 1455(d)(3)(8), (11). Accordingly, the CZMA strongly reflects the need to achieve a balance between conflicting uses of the nation's coastal environs. The Coastal Zone Act Reauthorization Amendments of 1990 strengthened the CZMA by requiring the state programs to focus on controlling land use activities and on the cumulative effect of activities in coastal zones.

In 1981, New York State adopted the Waterfront Revitalization and Coastal Resources Act (New York Executive Law § 910 *et seq.*) creating the New York State Coastal Management Program (CMP). The CMP received federal approval in 1982 [47 FR 47056 (22 October 1982)], authorizing New York to implement the Federal CZMA through its CMP. The CMP embodies 44 policy statements supportive of the intent to promote a balance between economic development and coastal resource preservation and optimization. The State of New York currently administers its Federally approved CMP through the New York State Department of State (NYSDOS). Pursuant to the Federal CZMA, New York State has defined its coastal zone boundaries and the policies to be utilized in evaluating projects occurring within these designated zones. Also in accord with the CZMA, the CMP (1) identifies energy production and transmission facilities to be of national import; and (2) directs that, in implementing the CMP, the DOS review the State Energy Master Plan for "assurance that there is adequate consideration of the national interest in the siting of the energy facilities which are necessary to meet requirements which are other than local in nature." The 1998 State Energy Master Plan, which provides state energy policies and long-ranging planning objectives, strongly encourages (1) developing adequate energy supply infrastructure in New York State; (2) increasing competition among suppliers of, and services pertaining to, electricity and natural gas; and (3) enhancing availability of efficient, competitively priced supplies of energy.

2. DESCRIPTION OF THE MILLENNIUM PIPELINE PROJECT

Millennium Pipeline Company, L.P. (Millennium or Applicant) has applied to the Federal Energy Regulatory Commission (FERC) for a Certificate of Public Convenience and Necessity to construct, acquire, own and operate the Millennium Pipeline Project (the Project). The Project consists of 442 miles of pipeline extending from an interconnection in Lake Erie at the Canada/United States (U.S.) border, through southern New York, to Mount Vernon, New York. Figure 1 (Attachment A-1) illustrates the Project's route. In addition, Millennium requested a Presidential Permit authorizing construction, operation, and maintenance of facilities at the International Border in Lake Erie for the importation of natural gas. The Project will follow existing utility corridors and easements for more than 86% of its route.

The Project represents a $650 million capital investment in New York's energy future. The purpose of the Project is to transport up to 700,000 dekatherms of natural gas per day (dth/d) and to provide firm transportation services for at least eight shippers for natural gas service beginning on 1 November 2002. In addition, Millennium will lease pipeline capacity to Columbia Gas Transmission Corporation to serve many existing consumers along the Southern Tier of New York State. The Millennium Pipeline will be able to transport the equivalent of enough gas to supply 2.1 million homes with natural gas per year, or five large electric generating facilities on an annual basis.

2.1 Energy Demands for the Project

The Public Service Commission of the State of New York ("PSCNY") has unequivocally advised the FERC that "additional pipeline capacity, as provided by Millennium, is needed in New York." Indeed, the PSCNY has categorically stated "there is no question that New York needs additional pipeline capacity." While the PSCNY has provided several reasons for its conclusion that the Millennium Project is needed to meet energy demands in New York State, its paramount concern merits quoting at length:

> "First, and most importantly, New York, and particularly New York City, is experiencing significant demand for new electric generation. Peak electricity usage has increased significantly in recent years and will likely continue for some time. At a minimum, we project that by 2005, there will be load increases in New York City of up to 1500 MW. These increases translate to some 270 Mdt of additional natural gas which likely will be required for load growth on a peak day in New York City by Summer 2005. This does not take into account New York City Metropolitan area core gas load growth of about 2% a year, which would require at least another 150 Mdt on winter peak or load growth in other parts of New York State. The 420 Mdt is a "bare bones" requirement of new capacity, which does not take into account fast moving marketplace changes in the electric industry"

> "To date, proposals by developers call for electric generation that could add substantial gas-fired generation in New York City, on Long Island and along New York's Southern Tier. A significant portion of that MW capacity must be built to meet load and reliability requirements; some additional capacity would benefit consumers by providing for increased competition in New York's wholesale electricity markets. In addition, more capacity will also benefit the environment because existing and less efficient, non-gas fueled generation or those that use gas off peak should be displaced with the new, more efficient baseload units. If a viable competitive wholesale electricity market is to develop, it is essential that additional generation be installed beyond the baseline required for load growth."
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> "The exact amount of additional pipeline capacity will depend upon a number of factors, including the timing of (1) proposed construction of new generation facilities; (2) older generation plants retirements; and (3) load growth. Taking into account the uncertainties associated with the amount of new generation that can be expected to be constructed, a mid-case projection for about 1,000 Mdt of additional gas capacity in the Southern Tier and Metropolitan New York City area appears reasonable if not conservative. Pipelines such as Millennium could supply a portion of the needed gas."

Additionally, the PSCNY has advised the FERC that the Millennium Project is needed for reliability and operational reasons. The PSCNY pointed out that "Millennium will be an additional pipeline to the New York City Metropolitan area, which would provide an alternative in the event an existing pipeline fails." With respect to operational benefits, the NYPSC has explained that "New York's Southern Tier will also benefit from the Millennium line because it will provide an East/West pipeline route that can interconnect with existing North/South pipelines in Western New York as well as provide available supply (emerging liquidity) from the Leidy market area."

Other studies confirm the need for the additional pipeline capacity that the Millennium Project will provide in New York State and the Northeast generally. Thus, for example, a study conducted by the FERC Staff in 1999 at the direction of the Appropriations Committee of the U.S. House of Representatives concluded that:

> "All projections indicate increasing demand for natural gas in the Northeastern United States over time, and the need for increased capacity to meet that demand. This leads staff to conclude that additional pipeline construction is likely to be required in the near future to meet that demand."

More recently, an October 2000 report by the Energy Information Administration of the U.S. Department of Energy noted that the U.S. Northeast leads the list of regions where natural gas capacity constraints and bottlenecks could develop this winter. In particular, the report noted that "in the New York City area, natural gas pipeline capacity appears to be less than is necessary to meet peak demands, and several constraint points have developed in recent years."

The Millennium Project could not only remedy many capacity constraints, but also reap considerable savings for consumers. Based on price forecasts for the month of January 2001, for instance, Millennium could supply more than 21 million Mcf of natural gas to New York at a savings of $5 per Mcf, reducing New York's gas bill by more than $105 million and savings the average household more than $150 in that month alone.

More specifically, Millennium's precedent agreements with several shippers show the demand for the services the Project will provide. Table 1 lists the long-term agreements that Millennium has reached.

Table 1
List of Millennium Pipeline Project Precedent Agreements

Customer	Term of Service (yrs)
CoEnergy Trading Company	20
Engage Energy (U.S.) L.P.	10
International Business Machines Corp.	10
North East Heat & Light Company	15
PanCanadian Energy Services, Inc.	10
Stand Energy Corporation	20
TransCanada Gas Services – A Division of TransCanada Energy Ltd.	
Quantum Energy Services, Inc.	10

2.2 Air Quality and Water Quality Benefits of the Project

In recent years, under both public and governmental pressure, there has been a growing demand for clean and efficient energy. This is especially true in the Northeastern U.S., which is faced with some of the highest population densities in the country, corresponding energy demands, and elevated air pollution. In particular, New York State has indicated it will require electric generation plants to significantly reduce emissions of acid rain forming nitrogen oxides (NO_x) and sulfur dioxide (SO_2) (New York Times 14 October 1999). As a result, natural gas has become, and will continue to be, the energy source of choice for new electric utility and independent power plants in the U.S. because of its extremely low emission levels and short construction lead-times (American Gas Association 1997).

However, in many areas in the Northeastern U.S., dependable and competitively priced sources of natural gas do not exist. Therefore, most electric generating facilities currently operate by burning high emitting coal or oil. These traditional fossil fuel-burning power plants contribute to

air pollution problems, emitting high levels of SO_2, NO_x, carbon monoxide (CO), carbon dioxide (CO_2), and particulate matter (PM) into the atmosphere. As noted above, SO_2 and NO_x are precursors of acid rain, and NO_x is one of the two primary precursors for smog or tropospheric ozone. CO_2 has been credited as one of the chief sources of the global warming trend, and PM has received heightened attention as a source of respiratory ailments.

Under the 1990 Clean Air Act Amendments [42 U.S.C. § 7511c(a)], the entire state of New York was classified as part of the Northeast Ozone Transport Region (OTR). The OTR includes the twelve northeastern-most states. The OTR was established because Congress recognized that due to the proximity and climatological interconnectedness of these states, arresting and preventing ground-level ozone was a regional problem. Accordingly, all states in the OTR must coordinate their efforts to curb ozone-producing emissions. Therefore, decreasing NO_x emissions in New York, New Jersey and Pennsylvania will benefit the entire OTR. By itself, the Millennium Project will reduce SO_2 emissions by more than 235,000 tons per year and Nox emissions by more than 55,000 tons per year.

In addition to inclusion in the OTR, certain areas within New York have been designated as severe, moderate and marginal non-attainment areas for ozone. In particular, the greater New York City metropolitan area has been designated as severe non-attainment for ozone and non-attainment for CO with New York City designated as non-attainment for PM. Therefore, air pollution is a general statewide concern and is a particular concern for the greater New York City metropolitan area. Moreover, New York's Adirondack Mountains have been scarred by the effects of acid rain caused by regional and in-state emissions of NO_x and SO_2 (Times Union 19 September 1999).

Utilizing natural gas as an energy source will contribute to the overall reduction of air pollution in the Northeast and New York State. The United States Environmental Protection Agency (USEPA) has estimated that in 1994, 70% of the nation's total SO_2 emissions and 33% of NO_X came from fossil-fuel-fired electric generation plants (USEPA 1996). New gas-fired power plants have the lowest emissions of any fossil-fueled electric generating systems and are the cleanest such plants in the world (Energy and Environmental Analysis, Inc. 2000).

Several of New York State's twenty-one coal-burning power plants are located along Millennium's proposed route (Environmental Advocates, NYPIRG Fund and Pace Energy Project 1998). Providing a supply of natural gas to these plants presents a tremendous opportunity to reduce their emissions either through complete retrofitting, or through selective reburn applications. Reburn involves the injection of natural gas into a coal or oil-fired boiler to produce NO_x reductions of 50 to 70%, and SO_2 reductions of 20 to 25% (American Gas Association 1997).

Moreover, many coal and oil-fired facilities must use "scrubbers" in their exhaust stacks to reduce emissions of air pollutants (American Gas Association 1997). The scrubbers result in large volumes of ash requiring proper disposal. This creates a solid waste disposal problem and increases operating costs of the electric generating plants. In contrast, natural gas-fired boilers do not need scrubbers or other add-on pollution controls (American Gas Association 1997).

2.3 Economic and Socioeconomic Benefits

The Millennium Project presents many economic and socioeconomic benefits to the State of New York, both during and after construction. Some of these benefits include the following:

- Improving the regional supply of, and access to, natural gas will help accelerate the conversion of old coal and oil-fired power plants to new cleaner gas-fired facilities.

- The enhanced cost-competitive access to gas supply will produce lower energy costs for homeowners, business, and industry.

  The pipeline will strengthen the region's energy infrastructure, offering competitively priced supplies of energy to current and new customers, creating additional incentives for economic development, and improving the reliability of both gas and electric transmission systems in New York and throughout the Northeast. The presence of a new, high-volume energy delivery system in the state could also attract additional investment into the state.

- The Project would reduce New York's reliance on imported oil and resulting peak period energy shortages and price spikes.

  The Project would promote increased competition and enhanced operational flexibility.

- Construction of the facilities will have a minimal impact on the environment since the pipeline follows existing easements and utility corridors for more than 86% of its length.

- Millennium will generate millions of dollars annually in state property taxes, which will be allocated to the counties and municipalities in which the pipeline is located. State revenue will also be created by franchise and sales taxes.

  During the construction, more than 4000 union construction workers will be employed to install the pipeline. This will present an employment opportunity for New York workers, and will inject a significant amount of money into the state's services industry.

- Native American lands will not be impacted by construction.

2.4 Environmental Impacts from the Proposed Project

The potential environmental impacts of the proposed project have been reviewed in accordance with the National Environmental Policy Act (NEPA). A draft Environmental Impact Statement (DEIS) was issued by FERC in April 1999. The FERC Staff determined in the DEIS that the Millennium Project, if constructed and operated in accordance with the mitigation measures outlined in the DEIS, would be an environmentally acceptable project. Nevertheless, in an on-going effort to mitigate environmental impacts, Millennium has continued to refine the Project.

Following project refinements and route revisions to address concerns in Westchester County, the FERC Staff issued in January of 2001 a Biological Assessment under the Endangered Species Act and an Essential Fish Habitat Assessment under the Magnuson-Stevens Fishery Conservation and Management Act. The FEC Staff also issued a Supplemental Draft Environmental impact Statement ("SDEIS") in March of 2001. Those documents resoundingly support Millennium's route selection and the efforts of Millennium to reduce environmental impacts for the entire project, and specifically, those portions of the project in the coastal zone, including the crossing of the Hudson River at Haverstraw Bay.

Due to the nature of a pipeline project, most of the environmental impacts are incurred during the construction phase. Beyond construction, environmental impacts associated with gas pipelines are virtually nonexistent and are generally positive, as explained in Section 2.2. Natural gas pipelines are the nation's safest method of transporting energy. Once operational, pipelines create virtually no environmental impacts. The only physical evidence of a pipeline will be a narrow maintained right-of-way, line markers, and, if necessary, small above ground maintenance facilities. Moreover, a pipeline like Millennium could well reduce the need for long haul power transmission lines, with resulting additional environmental benefits.

Backed by the project sponsors' long-standing commitment to environmental safety and integrity, Millennium has committed to constructing and operating the proposed project in the most environmentally rigorous manner. Specific Project commitments include:

Stream crossing techniques and mitigation measures to minimize effects on aquatic ecosystems;

Utilizing existing utility corridors for more than 86% of its length

Vigorous right-of-way restoration and reconstruction programs; and

A proven track record in construction and restoration in a variety of geological formations including wetlands, watercourses, and rocky terrain.

2.5 Natural Gas Pipeline Safety Issues

As the NYPSC has advised the FERC, the Millennium Project is likely to enhance gas pipeline safety in New York State. As the NYPSC has observed: "Millennium will benefit New York State's Southern Tier by substantially supplanting use of the aging and constrained Columbia A-5 line. Because of the A-5 line's configuration, which includes tight bends and restricting valves, some portions of it cannot be inspected internally. Millennium will use newer technology that allows for internal inspections. Supplanting use of the A-5 line will increase overall gas pipeline safety in the region."

Pipelines provide an extremely safe means of transporting natural gas. See SDEIS, part I, Section 5.11 at 5-56 to 5-68 (discussing pipeline safety). The natural gas pipeline industry overall has a very good safety record, and incidents involving natural gas pipelines are extremely

rare. Once built, the two main causes of pipeline damage are: 1) people unknowingly digging around an existing pipeline (i.e., third party damage); and 2) corrosion to the steel of the pipe itself.

Marking pipeline areas and notifying landowners, contractors and others who might be working around pipelines of the necessary precautions required when working in close proximity to natural gas pipelines are effective means of preventing third party damage. Natural gas pipelines, transmission facilities, and rights-of-way are marked and maintained according to federal guidelines. Regular communications with landowners, contractors and others working around pipelines are maintained so that they understand the safety issues and take the proper precautions. Contractors, utilities and other underground facility operators participate in programs like the Underground Facilities Protection Organization of New York (UFPO) which notifies utilities and contractors before people begin excavating near pipeline rights-of-way. The project will be monitored 24 hours per day, 365 days per year, from gas control facilities, as well as by foot and air patrols. This regular monitoring will ensure the safe operation of the delivery system.

The second major threat to pipelines is from corrosion that occurs on pipelines constructed prior to about 1970. Prior to that time, pipeline construction did not commonly involve the use of pipeline coatings and cathodic protection, two measures that are widely used today. Current pipeline coating and cathodic protection techniques have virtually eliminated the possibility of pipeline corrosion problems.

Pipeline companies continuously monitor their systems to detect leaks. They are able to detect these leaks by monitoring pressure, walking or flying over the lines looking for dead grass along the route, using automated, remote-controlled robots called "smart pigs" to run through the lines to detect corrosion, as well as a number of other measures. Pipeline leaks are generally slow developing and are easily detectable before they become serious. Moreover, natural gas is very difficult to ignite. It is only with the precise combination of air and gas that combustion will occur. If natural gas does ignite, the fire rises straight up because natural gas is lighter than air – it does not spread out.

The proposed pipeline will be 36- and 24-inch-diameter mill coated steel. The line will have a maximum allowable operating pressure of up to 1440 pounds per square inch (psi). The U.S. Department of Transportation (DOT) requires that the line be tested at 110 percent to 150 percent of its operating pressure to ensure the pipe's integrity. The area in which it is located determines the thickness of the pipe wall.

Throughout their construction and subsequent operation, natural gas pipelines are subjected to a number of rigorous measures as part of a safety system for protection and maintenance. All of these procedures must meet DOT standards. Some of these standards include:

- Welding: All welders must pass a stringent welding test to gain certification to work on the pipeline. Besides normal visual inspection, all welds are x-rayed to further ensure the integrity of the pipeline.

Hydrostatic Tests: Before being placed in operation, the line is filled with water and pressurized to a level from 110 percent to 150 percent of its operating pressure to test the strength of the pipe.

- Cathodic Protection: This is used to minimize corrosion on the pipe over time and to prevent pipeline failure. The pipe is cathodically protected by impressing a small electrical current through the pipe. The electric charge is harmless to the surrounding environment.

- Patrolling: A pipeline patrol system is maintained which meets all federal safety regulations. Patrols are performed on a regular basis, with frequency depending on the location of the line.

- Pipeline Safety Program: This program involves communicating pipeline safety information to local municipalities, contractors and residents along all the pipeline system.

In addition to the many safety measures designed for the entire project, Millennium has agreed to special safety measures for segments of the pipeline that will exist in close proximity to certain electric transmission lines owned and operated by Consolidated Edison (Con-Ed) in Westchester County. As part of the proceeding before the FERC, the PSCNY and Con-Ed raised concerns over the Millennium proposal to route the Millennium Project on right-of-way owned by Con-Ed and used for major transmission facilities to convey electricity to the New York City market. Because of the importance of these electric transmission facilities to the New York City market, the PSCNY and Con-Ed had raised concerns about reliability in the event of an incident involving the pipeline.

In order to resolve those concerns, Millennium and the PSCNY entered into a Memorandum of Understanding ("MOU") dated April 18, 2000. As part of that MOU, Millennium agreed to new routing in Westchester County that avoids, to the maximum extent possible, routing the pipeline in close proximity to, or across, the transmission lines. Where the pipeline will be in close proximity to the transmission lines or will cross the transmission lines, Millennium agreed to special safety precautions to resolve the concerns about reliability of the transmission lines. As is detailed in the MOU, those additional safety measures include increased pipe thickness, a periodic pigging program to verify the integrity of the pipeline, the installation of additional valves that are automatically and remotely controlled, and the use of close interval surveys and other monitoring systems to monitor pipe integrity. As a result of this process, the PSCNY now supports the Millennium Project.

3. COASTAL ZONE POLICY CONSISTENCY

Sections of the proposed project are within the coastal zone boundary of New York State. Specifically, the Project's proposed Hudson River crossing at Haverstraw Bay, routing through portions of the Village of Croton-on-Hudson, and the Lake Erie landing at Ripley, New York, are within New York's coastal zone. Thus, the following assessment identifies the CMP policies

and evaluates the Project's consistency with each. This consistency evaluation is provided to enable the NYSDOS, and other agencies required under the CZMA to consider CMP consistency, to evaluate the effect of the proposed project on New York's coastal zone resources.

3.1 Hudson River-Haverstraw Bay

3. 1 Description of Proposed Action

The proposed route for the Millennium Pipeline Project would cross the Hudson River at Haverstraw Bay between Rockland and Westchester Counties, following a 2.1-mile route from Bowline Point on the western side of the Bay to the Veterans Administration hospital property on the eastern shore (Figure 2, Attachment A-1).

The proposed Hudson River-Haverstraw Bay route from Bowline Point to the Veterans Hospital property facilitates Millennium's plans to provide gas service to Southern Energy New York's Bowline Point Generating Station, located on the western shore of Haverstraw Bay in Haverstraw, New York. The proposed route also minimizes pipeline mileage to the proposed terminus at Mount Vernon, New York.

3.1.2 Alternative Routes Evaluated

The Millennium Project is not economically viable without a Hudson River crossing. As set forth in its FERC application, Millennium proposes to construct and operate a 442-mile pipeline system to deliver 700,000 dekatherms ("Dth") of natural gas per day to points in New York State. Since Millennium has contracted to deliver half of that volume (350,000 Dth per day) to markets east of the Hudson River for its shippers, the Project would not make economic sense without the river crossing.

Moreover, there is no feasible alternative crossing location for the Millennium Project. In initially planning its pipeline route, Millennium recognized the sensitivity of any conventional crossing of the Hudson River and therefore investigated crossing locations upstream and downstream where a directionally-drilled crossing might be feasible or where environmental impacts otherwise could be reduced. Despite a lengthy and diligent consideration of possible options, no feasible alternative crossing location has been identified.

The FERC subsequently asked Millennium to review and evaluate two potential alternative routes across the Hudson River. "Alternative 1" would commence in Harriman State Park and cross the Hudson River north of Tomkins Cove, New York. "Alternative 2" would deviate from "Alternative 1" west of the river but would cross the river at the same location north of Tomkins Cove.

Millennium then conducted thorough field reviews of both of these routes, evaluated the associated environmental, engineering, and economic effects, and submitted its findings to the FERC on March 15, 1999. With respect to "Alternative 1," Millennium noted that it (1) would require 3.7 miles of construction and permanent ROW in Harriman State Park, which is listed on the National Register of Historic Places, including significant stretches of difficult sideling

construction that would require extra work space; (2) would also require construction through extremely congested residential and commercial areas west of the Hudson River; (3) would not provide sufficient workspace for staging either a conventional or directionally drilled crossing of the Hudson River on either the western or eastern shore of the river; and (4) would require the construction of approximately 4.9 miles of additional pipeline at a cost of at least $6 million. Millennium concluded that "Alternative 2" was significantly inferior to "Alternative 1" and not a viable route, since it would cross a number of built-up residential subdivisions, requiring the condemnation of numerous houses, and would pose the same intractable river crossing problems.

In the Draft Environmental Impact Statement ("DEIS") issued relative to the Millennium Project, the FERC thoroughly evaluated and flatly rejected both of the alternative routes that it had identified. Regarding "Alternative 1," the FERC concluded as follows:

Based on the high density of residential development along Alternative 1, the increased potential for impact on cultural and historic resources, and engineering considerations that would preclude any type of crossing at the alternate Hudson River crossing, we do not believe that Hudson River Alternative 1 would be environmentally preferable to the corresponding segment of the proposed route . . . (DEIS at 6-4).

The FERC similarly rejected "Alternative 2," finding that the lack of a corridor through the residential subdivisions west of the river was a "major disadvantage." (Id. at 6-5).

Later, during a publicly-noticed site visit of alternative Hudson River crossing routes held on November 30, 1999, the FERC Staff requested Millennium to conduct additional field work and analyses of potential alternative routes. Millennium provided the FERC with the results of those additional studies on December 17, 1999. The further review of "Alternative 1" revealed that it would require the clearing of approximately 19 acres of mature forest in Harriman State Park and the extensive grading of 44 acres in the park, would require the removal of at least 16 homes and about 20 trailers, and would not afford adequate workspace for staging a river crossing using any crossing method.

In addition, Millennium identified an "Alternative 3" along the Palisades Interstate Parkway, a National Historic Landmark. However, this route would involve approximately 7.2 miles of additional construction, require the clearing of approximately ten acres of mature trees along the Parkway, require the removal of several homes, and would still not provide an adequate staging area for the Hudson River crossing. Millennium reasonably concluded that these permanent impacts would be significantly greater than the limited and temporary impacts associated with the proposed route across Haverstraw Bay.

It is been suggested by some agencies that an alternative crossing location may exist proximate to the Tappan Zee Bridge. The speculation that a pipeline crossing near the Tappan Zee Bridge would be superior to the proposed route is not only unsupported, but also dubious on its face. A crossing at that location would not be at a narrower section of the river, as has been suggested, but would, in fact, be at a wider point, requiring a much longer crossing. In addition, the characteristics of the river at that point are substantially similar to those at the proposed crossing location, suggesting that potential impacts would not be reduced significantly. See response to

Policy 7 (concluding that Haverstraw Bay, Croton Bay and Tappan Zee Bay all have similar habitat characteristics and values). Further, there is insufficient staging on the west bank of the Hudson River in that area, given the congestion in the Nyack area and the steep slopes north and south of Nyack. Similar congestion exists on the east bank. Also, routing the pipeline along that alignment could interfere with the proposed reconstruction of the Tappan Zee Bridge or subject the Millennium Pipeline to unnecessary risk during the reconstruction of the Tappan Zee Bridge.

More fundamentally, there is no way to route the pipeline to and from a river crossing in the vicinity of the Tappan Zee Bridge without significant additional overland pipeline construction through parklands and residential and recreational areas, resulting in significant, adverse environmental impacts far greater than those associated with the corresponding segment of the proposed route.

The FERC revisited the question of alternative crossing locations in its Biological Assessment (BA January 2001) and Essential Fish Habitat Assessment (EFHA January 2001) for the Millennium Pipeline Project. The FERC's position on alternative crossing locations is stated in the BA (and repeated in the EFHA):

"While either of the alternate Hudson River crossing locations may be feasible in at least an engineering sense, they would both have numerous construction disadvantages, and be at least equal in impacts to the natural and human environment in comparison to construction across Haverstraw Bay. The alternative routes would each have significant impacts to the extensive development and land uses in the area, and overall, we can find no alternative that minimizes the impacts to the natural and human environment to any greater extent than the proposed route across the Hudson River. For this reason, we believe the proposed route must be evaluated on its own merit under the ESA."

Likewise, the DEIS includes a comprehensive assessment of alternative routes, rejecting all alternatives, including regional alternatives involving other gas pipelines. SDEIS, Part I at 3-1 to 3-5 and part II at 3-1 to 3-8.

In the final analysis, Millennium, the FERC, and others have devoted their best efforts and considerable time in attempting to identify an alternative location cross the Hudson River outside of Haverstraw Bay. However, notwithstanding those best efforts and the detailed study of proposed alternate routes, there are no technically feasible alternatives to a crossing at that location.

3.1.3 Alternative Construction Techniques

Millennium evaluated three pipeline crossing techniques for the Hudson River/Haverstraw Bay crossing. The three techniques were the open-water lay-barge method, directional drilling and open-cut, bottom-pull method. A summary of each technique, including the preferred method, the lay barge technique, is presented below:

The Millennium Pipeline will be constructed across Haverstraw Bay using an innovative open-water, lay barge method, with all excavated material to eventually be used as trench backfill, stockpiled in barges. Best management practices (BMPs) will be used, as necessary, to further minimize the potential for adverse environmental impacts. The principal features of the construction plan are:

- Trench Excavation: The trench will be excavated using a 6 cubic yard (CY) "environmental" or closed bucket in shallow water areas (within 500 feet of shore) and a 22 CY environmental or closed bucket will be used in deeper water areas. The trench will be excavated to a sufficient depth to provide 5 feet of cover over the pipeline outside of the navigation channel and 15 feet of cover within the navigation channel. The bottom width of the trench will be 10 feet over the entire length of the Haverstraw Bay crossing; in the non-channel areas, the top of the trench will be 70-feet wide and in the channel the top opening of the trench will be 150-feet wide.

  Dredged Material: Dredged material removed from the trench will be stockpiled in various sized bottom-dumping barges.

  Pipe Laying: A lay-barge will be used to weld and lay the 24-in pipe. (NOTE: 24-in pipe will be encased in 3-in. of concrete material.) The pipeline will be installed by floating it off the back of the lay-barge and then removing the floats to allow the pipe to settle into the trench.

  Trench Backfilling: After the pipeline has been placed in the trench, backfilling will begin. In deep water areas, a bottom-dump barge will be positioned directly over the trench (Differential Global Positioning System and sonar assisted, if necessary), silt curtains will be deployed around the barge, as necessary, and the dredged material will be placed over the pipeline. In shallow water areas, an environmental bucket will be used to remove the dredged material from the barge and place it over the pipeline. The trench will not remain open for more than two weeks in any given area. As an additional BMP, a dredging operations monitoring plan has been developed, in consultation with resource agencies, to monitor the efficacy of the BMPs and to adjust the use of the BMPs to mitigate adverse environmental impact to the extent practicable.

The entire 2.1-mile Haverstraw Bay crossing from Bowline Point on the western shore to the Veterans Hospital on the eastern shore should be completed in 2.5 months. The anticipated commencement date for work in the Hudson River is 1 September with an expected completion

[1] Although there has been debate since the inception of the project about the appropriate window for construction in Haverstraw Bay, consensus was formed by the environmental agencies regarding that issue from April to July of 2000. On April 7, 2000, the DOS wrote to the FERC stating: "It is the Department's opinion, based on currently provided information, that if dredging were to occur, the period of time for it should be between September

Two other pipeline construction techniques were evaluated for the Haverstraw Bay crossing; directional drilling and an open-cut bottom-pull method. The two alternative methods are discussed below:

Directional Drilling: Directional drilling involves drilling a pilot hole underneath the waterbody and then enlarging the pilot hole until the hole is large enough to accommodate the pipe. The technique requires a large staging area to permit welding of the pipe sections, completion of the outer coating, and then alignment prior to pulling the pipe through the hole. In general, hard or consolidated sediments are required to maintain the diameter of the hole prior to and during the drilling and pipe pulling procedures. At the location where the drill exits the bottom sediments, there would be a large volume (approximately 5400 CY for both drill holes) of drill muds (special bentonite clays) discharged to the waterbody under pressure.

Several problems were noted related to the use of this technique in Haverstraw Bay. First, the loose sediments will likely not maintain the hole diameter following drilling. The distance across Haverstraw Bay precludes drilling from one side to the other. Therefore, the pipe would need to be installed outward from each shore to the limit of drilling. Directional drilling from each shore would result in two separate discharges of drilling muds to Haverstraw Bay. In addition, as previously stated the technique requires a large staging area for pipe assembly. A sufficient staging area is present on the western shore (Bowline Point); however, the shore zone on the eastern shore (Veterans Hospital) is not large enough to permit pipe preparation. It was determined that directional drilling was not a viable technique for the Haverstraw Bay crossing.

Open-Cut Bottom-Pull Method: The initial technique proposed for the installation of the Millennium Pipeline across Haverstraw Bay was the open-cut, with a mechanical dredge, bottom-pull method. Because the crossing is approximately 2.1 miles in length, two dredge plants would be used to excavate the trench and install the concrete-coated pipeline. Dredged material excavated from the trench would be stockpiled in the water on either side of the trench. Due to positioning constraints and underwater resistance each dredge bucket would need to be brought to the surface prior to the bucket being repositioned and lowered to the bottom before placement along the trench. The procedure would need to be repeated for backfilling. Resource agencies expressed concerns regarding the sedimentation and turbidity that would result from; [1] the extended time period during which dredged material would be stockpiled in the water (approximately 3 months), [2] the extended time period during

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1 and November 15." Likewise, on May 2, 2000, NMFS commented o the Department of the Army: "The September through mid-November time frame seems to be the least ecologically sensitive period since the fish assemblage tends to be more mobile and capable of avoidance behaviors that reduce their risk of harm." Finally, on July 27, 2000, the NYSDEC wrote to Millennium: "the Department finds no impediment to adjusting the construction window to a 10 week period beginning September 1 to November 15."

which the trench would remain open, and [3] the use of open-bucket dredges to excavate and backfill the trench.

Millennium evaluated the bottom-pull method, and though it is believed that this technique could be employed in an environmentally acceptable manner for the Haverstraw Bay crossing, in an effort to identify the most environmentally acceptable crossing technique, the method was changed to the lay-barge method described above.

In its Essential Fish Habitat Assessment, the FERC recognized the significant reductions in potential impact that will be achieved by the lay-barge method compared to conventional dredging with side casting of the spoil. In particular, they noted that the closed bucket would reduce turbidity by 30 to 70 percent compared to an open bucket and that the area of impact is significantly reduced by the lay-barge method which stores the excavated material in barges. The FERC stated that ... "based on a comparison of construction techniques and their associated impacts, we conclude that Millennium's currently proposed construction technique would be the 'best available' method with the least overall impact on EFH in Haverstraw Bay" (See EFHA, p. 21).

Likewise, the SDEIS evaluates alternative construction techniques, concluding that the proposed lay barge method would "significantly reduce environmental impacts on the Hudson River and Haverstraw Bay". SDEIS, Part II at 2-37 to 2-44.

3.1.4 Environmental Impacts Associated With Lay Barge Dredging Method in Haverstraw Bay

Installation of the pipeline would involve the construction of an open trench across Haverstraw Bay with subsequent backfilling to the approximate original bottom elevation after the pipeline is placed on the bottom of the trench. The sequential construction activities would be completed within 2 weeks in any given area over the 2.1-mile wide section of the Bay. The bottom width of the trench would be 10 feet; the top of the trench would be 70 feet wide in shallow areas and 150 ft wide in the maintained navigation channel.

The method of construction, the dredging equipment employed, the season and duration of construction and BMPs employed for dredging would all have an influence on the potential for adverse environmental impacts. The proposed project uses the best available technology to construct the crossing and will result in the least environmental impact while meeting all applicable regulation, standards and criteria. The following sections address the effects of construction on aquatic resources and the rate of recovery of the habitat after construction is completed. The completed pipeline would have no long-term effect on aquatic resources.

Haverstraw Bay is a productive area of the Hudson River, which supports abundant benthic and fish communities. Among the fish community there are recreationally, commercially and ecologically important species. Numerous fish species migrate through Haverstraw Bay to

upstream spawning areas where the young remain in nursery areas or emigrate through the Bay to ocean waters. The Bay is important for overwintering striped bass and sturgeon. The benthic community supports this fish community, as well as blue crabs, a commercially important invertebrate that is seasonally abundant in the Bay. Because of the importance of this estuarine habitat, Haverstraw Bay is designated as significant coastal fish and wildlife habitat by the NYSDOS. While Haverstraw Bay has been given this special designation, the Bay has limited habitat diversity, particularly in the open water areas. Sampling and observations conducted for this project (Attachment A-1) confirm that the pipeline route across the Bay does not contain any special habitat conditions. The primary adverse impact of pipeline construction would be the disturbance to bottom habitat. There would be a temporary loss of habitat and benthic organisms in the material removed to create the trench. In addition, there would be sediment deposition in undisturbed benthic habitat adjacent to the trench caused by the general sediment disturbance of the dredge bucket contacting the bottom and pulling away from the bottom with each lift. This effect would be limited to the near vicinity of the trench in shallow water, but the effect would spread further in deeper sections and in the channel. Backfilling would also distribute sediments beyond the footprint of the trench. (Discussed in greater detail below.)

Backfilling over the pipeline would return the bottom substrate to its approximate pre-dredge contours. Because the dredging would increase the volume of the original compacted sediments, there would be a period of consolidation after the sediment was replaced over the trench. The natural processes of scour and deposition would quickly restore the substrate to its equilibrium depth in the area of the trench.

The sediments in the project area contain low levels of metals and other chemical contaminants. These contaminants are likely to be present in similar concentrations in the general vicinity of the pipeline route. Although dredging would disturb the contaminants in the sediments, the vast majority of sediments will be retained in the barges or resettle within or close to the trench. When the sediment is backfilled into the trench the resulting concentrations of contaminants would be very similar to pre-dredge levels in the footprint of the trench and in adjacent areas which receive sediment deposition as a result of the construction. A silt curtain could be used to reduce the spread of sediments during backfilling in the channel areas, as necessary. The dredging and backfilling operations have little potential to disperse contaminants that could have an adverse effect on aquatic life.

Dredge plume modeling (conducted by GAI) was used to estimate increases in suspended solids, the extent of the visible plume, and the thickness of sediment deposition that would result from dredging and backfilling the Haverstraw Bay crossing trench. The model results were broken down into four components defined below:

- Component 1: Dredging in shallow water using a 6 CY environmental bucket
- Component 2: Backfilling in shallow water using a 6 CY environmental bucket
- Component 3: Dredging in deep water using a 22 CY environmental bucket

- Component 4: Backfilling in deep water using a bottom dump barge (without the deployment of silt curtains)

The characteristics of the resulting turbidity plumes are summarized in Table 2 (Attachment A-1). The estimated steady-state visible plume resulting from the dredging operations is 60 feet wide (normal to flow) by 35 feet long (in the direction of flow) and 90 feet wide by 460 feet long for shallow water dredging (Component 1) and deep water dredging (Component 3), respectively. The visible plume associated with shallow water backfilling (Component 2) is estimated to be 90 feet wide by 170 feet long. The visible plume for the bottom dump barge discharge (component 4) is larger at 500 feet wide by 400 long, but of very short duration (30 minutes or less). The visible plume areas are approximately 2100 square feet (ft^2), 15,300 ft^2, 41,400 ft^2, and 200,000 ft^2 (per barge dump) for Components 1, 2, 3, and 4, respectively.

The plumes for Components 1 through 3 assume the dredge operates over a 50-foot length of trench before spudding forward; the plume dimension normal to flow was increased by this 50-foot width to account for the moving source. The estimates do not include an interaction between the plumes since they should be sufficiently far apart.

It is estimated that 13 days will be required to complete construction in the shallow water areas (Component 1), 16 days will be required to backfill the shallow water trench sections using the 6 CY bucket (Component 2), and 30 days will be required to excavate 9900 feet using the 22 CY environmental bucket (Component 3), with 52 barge loads of sediment re-deposited in the trench using a bottom dump barge (Component 4). The estimated construction times, sediment quantities, and distances translate to average approximate production rates of 77 feet per day for Component 1, 63 feet per day for Component 2, 330 feet per day for Component 3, and 2 barge dumps per day for Component 4.

The total area impacted by the operation on any given day includes all areas covered by a visible turbidity plume for any length of time. Using this assumption with the progress rates developed in the paragraph above, the areas impacted by Components 1, 2, 3, and 4 are approximately 3150 ft^2/day, 19,890 ft^2/day, 273,240ft^2/day, and 400,000 ft^2/day (Table 2, Attachment A-1).

Backfilling in the shallow, near-shore areas (Component 2) results in the maximum turbidity impact (170 feet long visible plume) and dredging (Component 3) provides the largest turbidity plume (460 feet long visible plume) in the central portion of the crossing. The total area impacted by the crossing can be calculated by multiplying the length of the visible plume by the trench length for each area (1000 feet for Component 2 and 9900 feet for Component 3), then summing the two quantities. This results in a total impacted area of 4,724,000 ft^2. Based on the map of the Haverstraw Bay significant coastal habitat boundary (NYSDOS 1990), 1.2% of the Bay bottom is estimated to be affected over the duration of the crossing project.

Total suspended sediment concentrations are not expected to exceed 1000 mg/l above ambient conditions except within 30 feet of dredging and backfilling operations. Suspended sediments are expected to disperse to concentrations between 500 mg/l above ambient conditions and 35 mg/l above ambient conditions within the mixing zone, defined as the area within the visible plume

and outside of 30 feet from the dredging operation. Concentrations less than 35 mg/l above ambient conditions are anticipated beyond the visible plume.

During dredging operations, the average thickness of redeposited sediments within Haverstraw Bay for components 1, 2, and 3 are estimated to be 0.18 feet, 0.11 feet, and 0.02 feet over the areal extent of the visible plume. Benthic species living in soft sediments, such as those observed during sampling in Haverstraw Bay, are able to favorably respond to sediment deposition in this range and greater.

During bottom dumping backfilling operations (Component 4) most of the sediment would be redeposited in the trench. Sediment accumulation is estimated to be 0.25 feet, just outside the trench (150 feet from trench centerline) and deposition continues to decrease between 150 feet and 400 feet. Deposition is negligible beyond 400 feet.

The estimated total suspended solids (TSS) concentrations resulting from the discharge of stockpiled dredge material from the bottom dump barge will not exceed 1000 mg/l above ambient conditions within 300 feet of the discharge. Turbidity levels are predicted to decrease quickly with the visible plume (35 mg/l above ambient conditions) dissipating within 30 minutes of disposal operation.

As part of its evaluation of the information submitted by Millennium in support of its application, the FERC requested that the Corps of Engineers review this modeling work. The Corps forwarded the modeling study to its Waterways Experiment Station (WES), the organization that developed the models used by Millennium's consultants. The FERC summarized WES' findings in its Biological Assessment for the project. The FERC stated:

"The WES concluded that the techniques used and the data employed represent the current state-of-the-practice for turbidity predictions from dredging operations such as those proposed for construction of the pipeline crossing. Further, the assumptions and data used in the predictions were reasonable and conservative. The WES ran its own simulations using the same models and found very good agreement with Millennium's results. Millennium's turbidity predictions were actually somewhat higher for three of the four construction components (dredging in shallow water, backfilling in shallow water, and dredging in deep water). The WES predictions of the plume size for the fourth component, backfilling in deep water, were the same as Millennium's predictions. However, WES predicted that the plume might be visible for 1 to 2 hours following backfill from a barge instead of the 30 minutes predicted by Millennium. Finally, the WES reviewed the predicted loss of material and the depth of burial/sedimentation outside the construction trench and found that Millennium's predicted loss and burial overestimated the expected impact. We believe that Millennium's modeling efforts and subsequent predictions of the turbidity plume are appropriately conservative for a sensitive habitat such as Haverstraw Bay." SDEIS, Part II at 2-42.

The benthic community is expected to recover quickly after backfilling is completed, because there would be large areas of undisturbed habitat on either side of the trench, which would serve to provide recruitment to the disturbed area. Estuarine sediments, particularly in shallow water,

are often disturbed by wind and ship generated waves, by unusually high and low tides which create higher than normal tidal currents, and by riverine flooding which creates high current velocities and carries a high sediment load. In a study of a dredging operation on the Thames River Estuary in Connecticut, the dredge-induced resuspension was primarily a near field phenomenon which was minor in comparison to resuspension caused by naturally occurring storm events (Bohlen et al 1979). These studies showed a distinct similarity between dredge and storm induced resuspension. Estuarine benthic organisms are adapted to the dynamic nature of the sediments, which permits them to respond quickly to the artificial disturbance of dredging. The site specific sampling did not find any benthic resources which could not respond quickly to the dredging disturbance.

Dredging would cause a temporary loss of feeding areas for fish over a very small portion of the Bay. The proposed crossing would affect approximately 1.2% of the bottom area of Haverstraw Bay. This temporary loss of usable habitat would be limited to one season; there would be no loss in long-term productivity because the environmental factors controlling estuarine productivity would not be impacted by the project. The work would be spread out over a 2.5-month period involving a maximum of 1300 feet of the entire crossing at any given time. The benthic habitat disturbed by dredging in the first instance would be well on its way to recovery before the last section of the work was completed. The fish species found during the site-specific sampling all have sufficient mobility to move to nearby undisturbed areas to continue feeding.

The presence of numerous migratory fish species in the Hudson River Estuary raises issues regarding the effect of dredging on migratory pathways. The pipeline crossing work is projected for the period from 1 September to 15 November (subject to final agency resolution of the crossing window). The staging of the work along the 2.1-mile route would ensure that the vast majority of the width of the river would be available for migration. Even within a 1300-foot work zone, the dredge and backfill operations would only disturb a very small area in the near vicinity of the dredge and barges. In the channel, a silt curtain may be deployed during backfilling. The silt curtain would be in place only during the actual release of sediment, as necessary. This short-term obstruction in a small portion of the channel would have no effect on migratory fish.

Striped bass, sturgeon, and other species overwinter in Haverstraw Bay. The channel area is likely to hold concentrations of fish from December through March. Scheduling the work during late summer and fall would avoid these overwintering concentrations. Because most species are generally inactive during cold water months any reduction in benthic productivity would not have an adverse effect on fish feeding. Wintering habitat would be fully available to the various species that congregate in this portion of the estuary, in the first winter after pipeline installation.

Best management practices (BMPs) would be applied to the dredging operation. An environmental (closed) dredge bucket would be used to minimize the loss of sediment. The lift rate of the bucket would be limited to 2 ft/sec or less to reduce water column turbidity. There would be no barge overflow because material would be retained for backfilling. These measures would ensure that the operations are at the practical limit for minimizing turbidity.

3.1.5 Impacts Of Prior Dredging Activities In Haverstraw Bay

The Federal channel through Haverstraw Bay is maintained at 32-feet below mean low water (MLW) by the US Army Corps of Engineers-New York District (USACE-NYD). The channel requires periodic maintenance dredging. In the summer of 1986, water quality was monitored during Haverstraw Bay maintenance dredging (Houston *et al.* 1992). Dredging was conducted mechanically using an open bucket with unrestricted lift speed and no silt curtains. This is a worst case example compared to state of the art dredging practices that would be used for the proposed Millennium Pipeline Haverstraw Bay crossing. Under these worst case conditions, maximum daily differences in dissolved oxygen (DO) were under 1.0 mg/l and averaged only 0.1 mg/l. The turbidity plume and suspended solids created by the dredging was greatest during flood tide. The maximum increase over ambient occurred within a radius of 500 feet, with a return to near ambient conditions between 1250 and 1500 feet from the dredge. The environmental assessment report on the Hudson River Channel maintenance-dredging program (USACE 1988) indicated that the Haverstraw Bay plume extended 750 feet from the dredge.

3.1.6 Review Of Coastal Zone Policy Consistency

1) *Restore, revitalize and redevelop deteriorated and underutilized waterfront areas for commercial, industrial, cultural, recreational and other compatible uses.*

Construction of the proposed Haverstraw Bay crossing would not involve development in deteriorated and underutilized waterfront areas, and thus this policy does not apply.

2) *Facilitate the siting of water-dependent uses and facilities on or adjacent to coastal waters.*

Construction of the proposed project crossing would not involve the siting of water-dependent uses and facilities on or adjacent to coastal waters, and thus this policy does not apply.

3) *Promote the development and use of the state's major ports as centers of commerce and industry, emphasizing the siting, in these port areas, including those under the jurisdiction of state public authorities, of land use and development which is essential to, or in support of, the waterborne transportation of cargo and people.*

Construction of the proposed Haverstraw Bay crossing would not involve development and use of any New York State major port facility. There are several public and private marinas in the general vicinity of the proposed project; however, none are involved in the transportation of people or cargo. Since no New York State major port facilities are involved with the proposed project, this policy is not applicable.

4) *Strengthen the economic base of smaller harbor areas by encouraging the development and enhancement of those traditional uses and activities, which have provided such areas with their unique maritime identity.*