

ORIGINAL CP02-52-000



**APPLICATION
FOR A CERTIFICATE OF
ENVIRONMENTAL COMPATIBILITY
AND PUBLIC NEED**

MARCH 25, 2002

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entirely or partially onshore. In addition, by tapping the existing Iroquois Pipeline approximately two miles off the Connecticut shore, instead of onshore in Milford, the Iroquois Extension will avoid crossing sensitive shellfishing areas located closer to shore.

1.6 ROUTE ALTERNATIVES

Iroquois considered several starting locations in Connecticut for the proposed Iroquois Extension, including both onshore and offshore beginning points. The proposed route for the Iroquois Extension is the result of a comprehensive evaluation process involving, but not limited to, the consideration of environmental, economic and engineering benefits and costs. As a result, Iroquois believes the proposed route represents the most environmentally acceptable, technologically feasible, and economically viable option for providing firm natural gas transportation service to the eastern end of Long Island

1.6.1 Elimination Of An Onshore Route Alternative

Iroquois's examined two pipeline route concepts to connect the existing Iroquois Pipeline in Connecticut to the eastern end of Long Island. The first route was an offshore route across the Long Island Sound to a landfall on Long Island. The second route was an all-onshore route across southern Connecticut into New York.

Comparing the onshore and offshore route concepts, Iroquois selected the offshore route because it is the least intrusive, most environmentally responsible and most direct route. The offshore route offers reduced length and minimal environmental impact as compared to an onshore route through densely populated areas in southern Connecticut. An overland route would involve extensive disturbance and impacts to landowners in areas that would not directly benefit from the incremental supply of natural gas. As a result, Iroquois did not consider the

onshore route in Connecticut to be a viable alternative and eliminated it from further consideration.

1.6.2 Offshore Selection Methodology

Having eliminated an onshore route in Connecticut from consideration, Iroquois analyzed potential supply points from the existing Iroquois Pipeline in Connecticut and major environmental and engineering considerations for construction and operation of the proposed Iroquois Extension. Iroquois's review of environmental considerations included:

- minimizing effects on ecologically sensitive areas, such as shellfish leasebeds;
- minimizing impacts to habitats of commercial shellfish;
minimizing impacts to commercial fishing areas;
- evaluating construction techniques and impacts associated with sea bottom sediment conditions
- protecting recreational areas, wildlife refuges, natural areas and preserves;
- protecting aesthetically important or otherwise significant geological formations; and
- providing for co-location opportunities.

Iroquois's primary engineering considerations included:

- locating the route within water deep enough to facilitate construction and minimize dredging, yet shallow enough to minimize costs and problems associated with deeper water installation;
- locating the marine tap interconnection (or tie-in) close to shore to minimize pressure drops in the system;
- locating the pipeline within sediment deposits to accommodate the necessary cover and to

avoid rock;

- minimizing crossings of existing obstructions and offshore pipelines;
- avoiding hazards such as steep bathymetric slopes and topographical relief;
- minimize potential impacts to shipping and navigation;
- avoiding known constraints such as the disposal mounds;
- utilizing available construction techniques; and
- minimizing crossing sea bottom features such as sand waves, rock outcrops and scarps.

1.6.3 Proposed Iroquois Extension Offshore Route

The primary constraints for the offshore pipeline route – locating the beginning and ending points of the route – was determined by the location of the existing Iroquois Pipeline offshore of Milford, and the delivery point on Long Island. Iroquois's existing mainline proceeds offshore in Milford heading east around Charles Island then turns southwesterly toward Northport, Long Island. Iroquois concluded that the most advantageous location for the marine tap interconnection to the existing Iroquois Pipeline would be offshore in order to minimize impacts to shellfish bed leases. Then, as described below, Iroquois determined the proposed route of the Iroquois Extension in the Long Island Sound. Figure 4 shows the proposed route of the Iroquois Extension and the offshore route alternatives analyzed by Iroquois.

The location of Iroquois's proposed marine tap interconnection (or tie-in) is shown in Figures 3 (sheet 1), 7 & 8. Iroquois selected the proposed location of the tie-in for several reasons. The primary advantages to this location are the benefits provided by the existing sediments at this location. From previous studies and information derived from the construction of the Iroquois Pipeline, the existing pipeline is buried approximately 10 feet below the seabed

10 feet - Sep. Disc

within sediments generally comprised of sand. This depth of burial provides a level of protection and a medium of stable material for the installation of new pipeline tie-in facilities associated with the Iroquois Extension. In addition, this depth of burial would provide sufficient cover over the pipeline and associated facilities to allow Iroquois to place a domed cover over the tie-in location to protect the facilities and allow the dome cover to be completely buried below the surface. Further, only a small area of one shellfish bed lease would be crossed by the Iroquois Extension at the tie-in location (see Figure 8 and Sections 1.8.3 and 3.3.5). As discussed in Section 3.3.5, impacts to this and adjacent lease beds from construction and operation of the Iroquois Extension are expected to minimal and short-term.

This tie-in location also enhances the efficiency of the pipeline by locating the new pipeline as close to shore as possible without impacting sensitive shellfish lease beds nearer to the shore. From an operational standpoint, the optimum location for the tie-in would be onshore in Connecticut at a mainline valve location. A tie-in at such a location would minimize pressure drops in the system and the resulting gas-flow bottleneck that may occur. The further offshore the tie-in, the higher the pressure drop in the system.

With respect to the location of the pipeline portion of Iroquois Extension, Iroquois sought to avoid rock outcrops and to route the pipeline in sedimentary environments that are more conducive to pipeline installation. As shown in Figure 11 and discussed in Section 2.1.1.1, there are four categories of bottom sedimentary environments identified in the Long Island Sound. The optimum location for a sub-sea pipeline is in fine-grained depositional areas where the pipeline could be installed in soft sediments that would allow the pipeline to be installed below the seabed, and that would allow the use of plowing with its reduced environmental impacts.

Other areas of either erosional, bedload transport, or sediment reworking would provide unsuitable sediments for protective cover over the pipeline because post-construction erosion could remove sedimentary cover from the pipeline. During the field surveys, the proposed route through the Long Island Sound was refined so that sufficient sedimentary deposits would provide the necessary cover. Accordingly, Iroquois believes that the proposed offshore tie-in location and routing provide optimum benefit from an operations standpoint and are environmentally preferable to the alternatives discussed below.

1.6.4 Iroquois Extension Route Alternatives

1.6.4.1 Looping Alternative

Iroquois evaluated an alternative in which the Iroquois Extension would originate onshore in Milford at a mainline valve location alongside the existing Iroquois Pipeline (the “Looping Alternative”) (Figure 4). Because of its potential impacts to shellfish leasebeds, Iroquois eliminated the Looping Alternative from further consideration.

The Looping Alternative would require the construction of approximately 1.5 miles of additional offshore pipeline and approximately one mile of additional onshore pipeline. Similar to its construction of the existing Iroquois Pipeline, Iroquois would open-cut the shore approach in Milford, install sheet piling to reduce the necessary right-of-way width for construction, and backfill the trench with the excavated dredged material.

The Looping Alternative would provide several operational advantages. By tapping further “upstream” on its existing mainline, the Looping Alternative would significantly reduce pressure drops along the Iroquois Pipeline, thereby allowing Iroquois to operate at its maximum allowable operating pressure. The Looping Alternative would also allow Iroquois the option of

installing a second crossing of Long Island Sound for reliability purposes. Further, the Looping Alternative would provide an upland area for installing all necessary connections, thereby simplifying the construction process, including installing pigging facilities for inspection purposes.

However, the Looping Alternative would have a greater impact on environmental resources. The installation of approximately 2.5 miles of additional pipe through freshwater and coastal wetlands would result in additional impacts to shellfish bed leases. Although operationally superior to Iroquois's proposed route, Iroquois eliminated the Looping Alternative from further consideration because of these greater potential impacts to shellfish bed leases.

1.6.4.2 Charles Island Alternative

Iroquois also evaluated its Charles Island Alternative in an attempt to obtain the advantages of the Looping Alternative while minimizing impacts to shellfish bed leases. The Charles Island Alternative would also require a pipeline originating onshore in Milford to provide optimum operation of the pipeline system. This alternative would involve two horizontal directional drills: one from shore to a point west of Charles Island; the second from west of Charles Island to a location southeast of Charles Island (Figure 4). Based on the difficulty of successfully completing two long, precise, complex horizontal directional drills, Iroquois eliminated the Charles Island Alternative from further consideration.

1.6.4.3 Marine Tap Interconnection Alternatives

Iroquois identified two offshore alternatives for the marine tap interconnection in an attempt to minimize the crossing of shellfish beds in the Connecticut waters of the Long Island Sound (Figure 4). The first alternative would tie-into the existing Iroquois Pipeline further

offshore in the Long Island Sound and would proceed southeasterly to New York waters ("Option 1"). The second alternative would begin further west in the Long Island Sound at an existing sub-sea "tee" on the Iroquois Pipeline, which was installed during mainline construction to service future potential markets in the Bridgeport area ("Option 2"). Option 2 would then travel eastward parallel to the Iroquois Pipeline for approximately 2.5 miles and then join with Option 1 and proceed to the New York state line.

The primary advantage of Options 1 and 2 over the proposed route, and the reason they were identified, is that both fully avoid shellfish bed leases. The proposed route, conversely, will cross one shellfish bed lease operated by Fairhaven Clam and Lobster Company, LLC (Lease No. 580). Nevertheless, as discussed in Section 3.3.5, the impacts on the lease beds are expected to be minimal and temporary. The fact that additional lease beds have been obtained since the Iroquois Pipeline was constructed in 1991 provides evidence that construction impacts were temporary, that the area was restored following construction, and that the area recovered and currently provides habitat suitable for shellfishing.

Although Options 1 and 2 fully avoid the shellfish lease beds, they are environmentally and operationally inferior to the proposed route and, therefore, were eliminated from further consideration. The pipeline and tie-in for both options would be constructed in over 70 feet of water as compared to a depth of 30 to 40 feet for Iroquois's proposed tie-in. Information from local lobstermen during the planning stages of the Iroquois Extension revealed that the area of the sub-sea tee and the tie-in location for Option 1 is a nursery area for lobsters and contains a high percentage of female lobsters. These local lobstermen have indicated that the deeper waters in the center of Long Island Sound provide prime lobster habitat. The tie-in locations for Options

1 and 2 are located north of Stratford Shoal and are located within erosion, non-depositional, or sediment-sorting sedimentary environments, which indicates that the area is less stable than the proposed tie-in location. Furthermore, because the tie-ins for both options are further west on the existing mainline in the Long Island Sound, Options 1 and 2 could cause unacceptable pressure drops and bottlenecks on the Iroquois Pipeline.

1.7 CONSTRUCTION PROCEDURES

The process of selecting the proposed route of the Iroquois Extension route was based on information obtained in numerous data gathering surveys in the field, results of literature searches, review of public records, discussions with installation contractors, and conversations with various regulatory and citizens groups. This work enabled Iroquois to refine the design of the proposed route to minimize disturbance to marine life and commercial/recreational activities.

Iroquois proposes to begin construction of the Iroquois Extension in the fall of 2003 and expects that construction will be completed by March 1, 2004. Pipe laying is expected to proceed at a rate of between 3,500 and 4,000 feet per day (the length of the proposed Iroquois Extension in Connecticut is less than 40,000 linear feet). Although Iroquois expects to complete construction by March 1, 2004, construction could extend into the early spring depending on the actual start date and potential delays during construction. Iroquois's evaluation of construction-related project impacts in Section 3 assumes that construction could extend into early spring and concludes that such impacts would also be short-term and minimal.

Iroquois anticipates that the total work force to construct the Iroquois Extension would be approximately 250 workers. This total would consist of approximately 200 workers on the marine lay barge spread, approximately 40 workers onshore supporting the operations, and