# 2.0 PROPOSED ACTION

## 2.1 PROPOSED FACILITIES

Islander East proposes to construct and operate a natural gas transmission pipeline system that would move 285,000 Dth/d of natural gas from Algonquin's existing C-1 mainline near North Haven, Connecticut to new electric generating plants on Long Island, New York. Algonquin proposes the uprate of about 27 miles of 10- and 16-inch-diameter pipeline and provide 12,028 horsepower (hp) of compression at a new compressor station. Islander East proposes to construct 50.4 miles of 24-inch-diameter pipeline, three meter stations, and five mainline valves. Islander East and Algonquin propose to begin construction in the winter of 2002/2003.

Figure 2.1-1 shows the general location of the proposed facilities. Table 2.1-1 shows the name, description, pipeline diameter, number of miles of pipeline, and county/state location for each facility. The table also includes the number of offshore pipeline miles within Long Island Sound, New York. The associated aboveground facilities are in table 2.1-2. Detailed maps of the pipeline and aboveground facilities are presented in appendix B.

TABLE 2.1-1
**Pipeline Facilities**

| Facility Name | Description | Diameter (inches) | Length (miles) | | County, State |
|---|---|---|---|---|---|
| ALGONQUIN | | | | | |
| AGT Retest | Upgrade C-1 and C-1 L Lines | 10 and 16 | 27.4 (13.7 Each Line) | | New Haven County, CT |
| Anomaly Investigations | Inspect C-1 Line | 10 | < 0.1 | | New Haven County, CT |
| ISLANDER EAST | | | | | |
| Islander East Pipeline | New Mainline | 24 | 44.8 | 21.2 a/<br>23.6 b/ | New Haven County, CT<br>Suffolk County, NY |
| Calverton Lateral | New Lateral | 24 | 5.6 | | Suffolk County, NY |

a/ Includes 10.2 miles onshore and 11.0 miles offshore in Long Island Sound.
b/ Includes 12.0 miles onshore and 11.6 miles offshore in Long Island Sound.
Note: AGT-Algonquin Gas Transmission Company.

## 2.2 LAND REQUIREMENTS

### 2.2.1 Onshore

The amount of land required to construct a pipeline depends on a number of factors, including the type of activities being undertaken, the topography of the area, and the current land use along the route. The Islander East Pipeline Project would use onshore construction right-of-way widths varying from 25 to 110 feet (see table 2.2-1). Algonquin proposes to use between 25 and 110 feet of construction right-of-way to conduct the Algonquin Gas Transmission (AGT) Retest and the Anomaly Investigations. Islander East proposes, in general, to use a 75-foot-wide construction right-of-way.

TABLE 2.1-2
**Aboveground Facilities**

| Facility Name | Location (milepost) | County, State |
|---|---|---|
| ALGONQUIN | | |
| Cheshire Compressor Station | 0.0 a/ | New Haven County, CT |
| Launcher Removal | 0.6 a/ | New Haven County, CT |
| ISLANDER EAST | | |
| North Haven Meter Station | 0.0 b/ | New Haven County, CT |
| Mainline Valve | 6.0 b/ | New Haven County, CT |
| Mainline Valve | 9.9 b/ | New Haven County, CT |
| Mainline Valve and Side Tap to Potential Future Customer | 33.2 b/ | Suffolk County, NY |
| Mainline Valve and Side Tap to Calverton Lateral | 34.3 b/ | Suffolk County, NY |
| Mainline Valve | 42.0 b/ | Suffolk County, NY |
| Brookhaven Meter Station | 44.8 b/ | Suffolk County, NY |
| AES Calverton Meter Station | CA 5.6 c/ | Suffolk County, NY |

a/ Algonquin C-1 and C-1L pipelines mileposts.
b/ Islander East Pipeline milepost.
c/ Calverton Lateral milepost. Mileposts for the Calverton Lateral are preceded by "CA" to distinguish them from mileposts on the Islander East Pipeline.

Following construction and restoration of the construction right-of-way, permanent right-of-way would be retained to provide access for operations and maintenance of the pipeline facilities and as a safety measure. The Algonquin portion of the project would retain the existing 50-foot-wide permanent right-of-way for its AGT Retest and Anomaly Investigations. Islander East would acquire between 10 and 50 feet of new permanent right-of-way onshore for its Islander East Pipeline and Calverton Lateral. Figures C-1 through C-30 in appendix C show typical cross-section drawings indicating temporary construction rights-of-way, new permanent rights-of-way and the limits of the existing permanent rights-of-way.

Where feasible, the construction and permanent rights-of-way would be collocated along other existing rights-of-way to minimize environmental impacts. Islander East proposes to align the Islander East Pipeline and Calverton Lateral with existing rights-of-way including: the existing Algonquin C-5 Pipeline; the Branford Steam Railroad; private roads; KeySpan and Long Island Power Authority power lines; the William Floyd Parkway (Suffolk County Route 46); a KeySpan fiber optic line; and a Suffolk County water line. Table 2.2-1 identifies where the proposed project is collocated with other rights-of-way.

TABLE 2.2-1
**Construction and Permanent Right-of-Way Requirements**

| Facility Location (mileposts) | Distance (miles) | Construction Right-of-Way Width (feet) | Permanent Right-of-Way Width | Adjacent Right-of-Way | Offset From Feature (feet) | Direction From Feature | Construction Right-of-Way Overlap (feet) | Permanent Right-of-Way Overlap (feet) [a] | Figure Number in App. C [b] |
|---|---|---|---|---|---|---|---|---|---|
| ALGONQUIN | | | | | | | | | |
| Anomaly Investigations [c] | | | | | | | | | |
| 3.72–3.81 | 0.09 | 75 | 50 | N/A | N/A | N/A | 50 | 50 | Non-typical |
| AGT Retest [d] | | | | | | | | | |
| 7.99–8.05 | 0.06 | 100 | 50 | N/A | N/A | N/A | 50 | 50 | Non-typical |
| 8.75–8.86 | 0.11 | 25 | 25 | N/A | N/A | N/A | 25 | 25 | Non-typical |
| 8.86–8.89 | 0.03 | 75 | 50 | N/A | N/A | N/A | 50 | 50 | Non-typical |
| 8.89–8.93 | 0.04 | 110 | 50 | N/A | N/A | N/A | 50 | 50 | Non-typical |
| ISLANDER EAST | | | | | | | | | |
| Islander East Pipeline | | | | | | | | | |
| 0.00–0.19 | 0.19 | 75 | 45 | Algonquin C-5 Pipeline | 15 | West | 40 | 30 | CT-1 |
| 0.19–0.47 | 0.28 | 75 | 50 | Algonquin C-5 Pipeline | 20 | West | 35 | 30 | CT-2 |
| 0.47–0.57 | 0.10 | 75 | 50 | Algonquin C-5 Pipeline | 50 | East | 10 | 0 | Non-typical |
| 0.57–0.68 | 0.11 | 75 | 40 | Algonquin C-5 Pipeline | 10 | West | 45 | 30 | CT-3 |
| 0.68–0.84 | 0.16 | 75 | 45 | Algonquin C-5 Pipeline | 15 | West | 40 | 30 | CT-1 |
| 0.84–0.87 | 0.03 | 75 | 40 | Algonquin C-5 Pipeline | 10 | West | 45 | 30 | CT-3 |
| 0.87–1.11 | 0.24 | 75 | 45 | Algonquin C-5 Pipeline | 15 | West | 40 | 30 | CT-1 |
| 1.11–2.70 | 1.59 | 75 | 50 | Algonquin C-5 Pipeline | 20 | West | 35 | 30 | CT-2 |
| 2.70–2.95 | 0.25 | 75 | 55 | Algonquin C-5 Pipeline | 25 | East | 20 | 20 | CT-4 |
| 2.95–3.04 | 0.09 | 75 | 50 | Algonquin C-5 Pipeline | 20 | East | 25 | 20 | CT-5 |
| 3.04–3.06 | 0.02 | 75 | 50 | Algonquin C-5 Pipeline | 30 | East | 40 | 10 | Non-typical |
| 3.06–3.27 | 0.21 | 75 | 45 | Algonquin C-5 Pipeline | 15 | East | 30 | 20 | CT-6 |
| 3.27–3.32 | 0.05 | 75 | 50 | Algonquin C-5 Pipeline | 35 | East | 10 | 5 | Non-typical |
| 3.32–3.63 | 0.31 | 75 | 50 | Algonquin C-5 Pipeline | 20 | East | 25 | 20 | CT-5 |
| 3.63–3.79 | 0.16 | 75 | 40 | Algonquin C-5 Pipeline | 10 | West | 45 | 30 | CT-3 |
| 3.79–4.22 | 0.43 | 75 | 50 | Algonquin C-5 Pipeline | 20 | West | 35 | 30 | CT-2 |
| 4.22–4.26 | 0.04 | 75 | 45 | Algonquin C-5 Pipeline | 15 | West | 40 | 30 | CT-1 |
| 4.26–4.37 | 0.11 | 75 | 50 | Algonquin C-5 Pipeline | 20 | West | 35 | 30 | CT-2 |
| 4.37–4.41 | 0.04 | 75 | 40 | Algonquin C-5 Pipeline | 10 | West | 45 | 30 | CT-3 |
| 4.41–5.02 | 0.61 | 75 | 50 | Algonquin C-5 Pipeline | 20 | West | 35 | 30 | CT-2 |
| 5.02–5.04 | 0.02 | 75 | 50 | Algonquin C-5 Pipeline | 30 | West | 25 | 20 | Non-typical |
| 5.04–5.25 | 0.21 | 75 | 40 | Algonquin C-5 Pipeline | 10 | West | 45 | 30 | CT-3 |
| 5.25–5.34 | 0.09 | 75 | 45 | Algonquin C-5 Pipeline | 15 | East | 30 | 20 | CT-6 |
| 5.34–5.49 | 0.15 | 75 | 45 | Algonquin C-5 Pipeline | 15 | West | 40 | 30 | CT-1 |
| 5.49–5.64 | 0.15 | 75 | 40 | Algonquin C-5 Pipeline | 10 | West | 45 | 30 | CT-3 |
| 5.64–6.07 | 0.43 | 75 | 50 | Algonquin C-5 Pipeline | 20 | West | 35 | 30 | CT-2 |
| 6.07–6.13 | 0.06 | 75 | 50 | Algonquin C-5 Pipeline | 40 | West | 15 | 10 | Non-typical |
| 6.13–6.27 | 0.14 | 75 | 50 | Branford Steam Railroad | 50 | West | 0-10 | 0-10 | CT-7 |
| 6.27–7.00 | 0.73 | 75 | 50 | Branford Steam Railroad | 25 | West | 25-35 | 15-25 | CT-8 |

TABLE 2.2-1
**Construction and Permanent Right-of-Way Requirements (continued)**

| Facility Location (mileposts) | Distance (miles) | Construction Right-of-Way Width (feet) | Permanent Right-of-Way Width | Adjacent Right-of-Way | Offset From Feature (feet) | Direction From Feature | Construction Right-of-Way Overlap (feet) | Permanent Right-of-Way Overlap (feet) [a] | Figure Number in App. C [a] |
|---|---|---|---|---|---|---|---|---|---|
| 7.00–7.19 | 0.19 | 75 | 50 | Branford Steam Railroad | 50 | West | 0-10 | 0-10 | CT-7 |
| 7.19–7.44 | 0.25 | 75 | 50 | Branford Steam Railroad | 25 | East | 25-35 | 15-25 | CT-9 |
| 7.44–7.79 | 0.35 | 75 | 50 | New right-of-way | N/A | N/A | N/A | N/A | CT-10 |
| 7.79–8.07 | 0.28 | 75 | 50 | New right-of-way | N/A | N/A | N/A | N/A | CT-11 |
| 8.07–8.24 | 0.17 | 75 | 50 | Branford Steam Railroad | 40 | East | 0-15 | 0-5 | CT-12 |
| 8.24–8.43 | 0.19 | 75 | 50 | Branford Steam Railroad | 25 | East | 25-35 | 15-25 | CT-9 |
| 8.43–8.92 | 0.49 | 75 | 50 | Branford Steam Railroad | 25 | West | 25-35 | 15-25 | CT-8 |
| 8.92–9.45 | 0.53 | 75 | 50 | Branford Steam Railroad | 25 | East | 25-35 | 15-25 | CT-9 |
| 9.45–9.57 | 0.12 | 75 | 50 | Branford Steam Railroad | 25 | West | 25-35 | 15-25 | CT-8 |
| 9.57–9.60 | 0.03 | 75 | 50 | Branford Steam Railroad | 50 | West | 0-10 | 0-10 | CT-7 |
| 9.60–9.70 | 0.10 | 75 | 50 | Branford Steam Railroad | 25 | West | 25-35 | 15-25 | CT-8 |
| 9.70–9.92 | 0.22 | 75 | 50 | New right-of-way | N/A | N/A | N/A | N/A | CT-11 |
| 9.92–10.04 | 0.12 | 75 | 50 | Branford Steam Railroad | 25 | West | 25-35 | 15-25 | CT-8 |
| 10.04–10.10 | 0.06 | 75 | 50 | Branford Steam Railroad | 60 | West | 0 | 0 | Non-typical |
| 10.10–10.20 | 0.11 | 60 | 50 | New right-of-way | N/A | N/A | N/A | N/A | Non-typical |
| 10.20–32.60 | 22.4 | 80 [c] | 10 | New right-of-way (sea floor) | N/A | N/A | N/A | N/A | N/A |
| 32.60–32.83 | 0.23 | 190 [c] | 10 | New right-of-way (beach approach) | N/A | N/A | N/A | N/A | LA-1 |
| 32.83–33.02 | 0.19 | 75 | 50 | Private Road | 15 | East | N/A | N/A | NY-1 |
| 33.02–33.21 | 0.19 | 75 | 50 | Private Road | 15 | West | N/A | N/A | NY-2 |
| 33.21–33.26 | 0.05 | 75 | 50 | Private Road | 15 | East | N/A | N/A | NY-1 |
| 33.26–33.45 | 0.19 | 75 | 50 | KeySpan Power Line | 35 | East | 20 | 20 | NY-3 |
| 33.45–33.61 | 0.16 | 75 | 50 | Private Road | 35 | East | N/A | N/A | Non-typical |
| 33.61–34.18 | 0.57 | 75 | 50 | KeySpan Power Line | 35 | West | 20 | 15 | NY-4 |
| 34.18–34.51 | 0.33 | 75 | 50 | New right-of-way | N/A | N/A | N/A | N/A | NY-5 |
| 34.51–36.89 | 2.38 | 75 | 50 | William Floyd Parkway | 30 | East | **TBD** | **TBD** | NY-6 |
| 36.89–37.38 | 0.49 | 60 | 45 | William Floyd Parkway | 10 | East | **TBD** | **TBD** | NY-7 |
| 37.38–38.52 | 1.14 | 75 | 50 | State Route 25 Interchange | Varies | East | **TBD** | **TBD** | NY-8 |
| 38.52–40.14 | 1.62 | 75 | 50 | William Floyd Parkway | 30 | East | **TBD** | **TBD** | NY-6 |
| 40.14–40.38 | 0.24 | 75 | 50 | New right-of-way | N/A | N/A | N/A | N/A | NY-9 |
| 40.38–41.27 | 0.89 | 75 | 50 | William Floyd Parkway | 100 | East | **TBD** | **TBD** | NY-10 |
| 41.27–41.68 | 0.41 | 75 | 50 | William Floyd Parkway | 30 | East | **TBD** | **TBD** | NY-6 |
| 41.68–42.02 | 0.34 | 75 | 50 | New right-of-way | N/A | N/A | N/A | N/A | NY-9 |
| 42.02–42.36 | 0.34 | 75 | 50 | Private Road | 15 | East | N/A | N/A | NY-1 |
| 42.36–42.60 | 0.24 | 75 | 50 | Private Road | 15 | West | N/A | N/A | NY-2 |

TABLE 2.2-1
**Construction and Permanent Right-of-Way Requirements (continued)**

| Facility Location (mileposts) | Distance (mile) | Construction Right-of-Way Width (feet) | Permanent Right-of-Way Width | Adjacent Right-of-Way | Offset From Feature (feet) | Direction From Feature | Construction Right-of-Way Overlap (feet) | Permanent Right-of-Way Overlap (feet) a/ | Figure Number in App. C b/ |
|---|---|---|---|---|---|---|---|---|---|
| 42.60–43.70 | 1.10 | 75 | 50 | KeySpan Fiber Optic | 25 | South | **TBD** | **TBD** | NY-11 |
| 43.70–44.80 | 1.10 | 75 | 50 | Suffolk County Water Line | 25 | South | **TBD** | **TBD** | NY-12 |
| CALVERTON LATERAL | | | | | | | | | |
| 0.00–0.53 | 0.53 | 75 | 50 | Long Island Power Authority Power Line | 35 | North | 20 | 20 | CA-1 |
| 0.53–0.68 | 0.15 | 75 | 50 | New right-of-way | N/A | N/A | N/A | N/A | CA-2 |
| 0.68–1.15 | 0.47 | 75 | 50 | Long Island Power Authority Power Line | 35 | South | 20 | 20 | CA-3 |
| 1.15–2.72 | 1.57 | 75 | 50 | New right-of-way | N/A | N/A | N/A | N/A | N/A |
| 2.72–5.13 | 2.41 | 75 | 50 | Long Island Power Authority Power Line | 25 | South | **TBD** | **TBD** | CA-4 |
| 5.13–5.56 | 0.43 | 75 | 50 | New right-of-way | N/A | N/A | N/A | N/A | CA-5 |

a/ The amount of construction and permanent rights-of-way overlap would be determined during upcoming engineering survey in the summer of 2002.
b/ Only typical right-of-way configurations are provided in appendix C.
c/ A limited amount of construction right-of-way would be required for the excavation of the anomaly investigation sites. The pipelines are located within an existing 50-foot-wide permanent right-of-way.
d/ A limited amount of construction right-of-way would be required for hydrostatic testing on the AGT Retest. The pipelines are located within an existing 50-foot-wide permanent right-of-way.
e/ No defined construction right-of-way through Long Island Sound would be acquired. However, the width of the primary work area required for laying the pipe on the sea floor would be between 80 feet and 190 feet, depending on the construction method used. Anchors and cables on maritime vessels may impact an area on the sea floor up to 2,000 feet on either side of the vessels.

Notes: TBD = To be determined.
N/A =Not applicable.

In addition to the construction right-of-way, additional temporary workspaces would be required during retesting, anomaly investigations, and construction. Generally, additional temporary workspaces are required at wetlands, waterbody, road, railroad, and foreign utility crossings; in cultivated fields and residential areas; in areas of solid bedrock; at steep slopes and side slopes; at some access points to the right-of-way; and at the ends of a construction spread for mobilization and demobilization of equipment. The location, dimensions and reasons for additional temporary workspaces required for the Islander East Pipeline Project are provided in appendix C.

Islander East has proposed to upgrade or construct some new roads for temporary and permanent access to the project area. The names and location of access roads as well as descriptions of required upgrades are presented in table 2.2-2.

**TABLE 2.2-2**
**Access Roads**

| Access Road | Location | Length (feet) | Width (feet) | Surface Type | Upgrades Required |
|---|---|---|---|---|---|
| ALGONQUIN | | | | | |
| PAR 0.1 [a] | From Johnson Road to the Compressor Station at Milepost (MP) 0.0 | 1,640 | 40 | Paved/gravel | New road construction |
| PAR 0.6 [a] | From Diana Court to Existing Facility at MP 0.6 | 90 | 15 | Paved | None |
| TAR 3.8 [a] | From Reservoir Road down the perm. right-of-way to MP 3.7 | 676 | 25 | Dirt | None |
| TAR 3.8 [a] | From MP 3.7 down the permanent right-of-way to MP 3.8 | 48 | 25 | Dirt | None |
| TAR 8.9 [a] | From Oliver Creek Road to MP 8.9 | 400 | 12 | Gravel | None |
| ISLANDER EAST | | | | | |
| TAR 2.4 [b] | From Thompson Road to MP 2.4 | 350 | 12 | Dirt | None |
| TAR 4.4 [b] | From Doral Farm Road to MP 4.4 and Twin Lakes Road | 3,000 | 15 | Dirt | Light grading and limbing |
| TAR 5.50 [b] | From Highway 22 to MP 5.5 | 810 | 15-20 | Paved | None |
| TAR 5.54 [b] | From TAR 5.50 to MP 5.54 | 360 | 15 | Paved | None |
| PAR 6.04 [b] | From Commerce Dr. to Valve at MP 6.0 | 40 | 12 | Gravel | New road construction |
| TAR 7.4 [b] | From Highway 139 to MP 7.4 | 380 | >50 | Gravel | None (existing parking lot) |
| TAR 9.4 [b] | From Pleasant Point Road to MP 9.4 | 150 | 15 | Gravel | None |
| PAR 9.9 [b] | From Totoket Road to Valve at MP 9.9 | 1,500 | 25 | Paved | None |
| | | 150 | 20 | Gravel | None |
| TAR 10.0 [b] | From MP 10.0 to MP 10.2 | 700 | 15 | Paved | None |
| PAR 33.3 [b] | From LILCO Road to Valve at MP 33.3 | 1,250 | 25 | Paved | None for 1,250 feet |
| | | 75 | 12 | Gravel | New road construction for 75 feet |
| PAR 34.2 [b] | From Defense Hill Road to Valve at MP 34.2 | 1,240 | 12 | Gravel | New Road Construction |
| PAR 42.01 [b] | From Frontage Road to Valve at MP 42.0 | 1,810 | 12 | Dirt | Light grading & add gravel surface |
| PAR 44.8 [b] | From Patchogue Yaphank Road to Meter Station at MP 44.8 | 750 | 12 | Gravel | New road construction |
| TAR CA 0.6 [c] | From LILCO Road to MP 0.6 | 400 | 12 | Dirt | Light grading and limbing |
| PAR CA 5.55 [c] | From State Route 25 to Meter Station at MP 5.6 | 50 | 20 | Paved | New road construction |

Note: PAR = permanent access road; TAR = temporary access road
a/ Algonquin C-1 and C-1L pipelines milepost.
b/ Islander East Pipeline milepost.
c/ Calverton Lateral milepost.

Islander East would also require pipe storage and contractor yards for each construction spread. These are typically large tracts of open land usually located away from the construction site but convenient to the pipeline and existing rail and highway transportation routes. Islander East has identified one yard and one port facility for this project to date. The yard, referred to as the Toelles Road Pipe Yard, and would function as both a pipe storage and contractor yard, and is a 17.9-acre parcel of open land in Wallingford, Connecticut. Of the 17.9 acres, only 10.1 acres would be used by Islander East. The site was previously used as a sand borrow pit. It is currently zoned for industrial use.

In addition to the pipe storage yard, Islander East is planning to use the Gateway Terminal in New Haven, Connecticut to stage construction for the offshore portion of the project. The facility is an existing commercial port used by marine vessels.

New land requirements for construction and operation of the aboveground facilities would involve the acquisition by Algonquin of about 61 acres for the new compressor station. All other aboveground facilities (three meter stations and five valves) would be constructed within the existing or new permanent right-of-way. Table 2.2-3 provides the names, location, dimensions, and acreage of aboveground facility sites.

TABLE 2.2-3
**Aboveground Facility Land Requirements**

| Facility | Milepost | Construction Acreage | Operation Acreage | Comments |
|---|---|---|---|---|
| ALGONQUIN | | | | |
| Cheshire Compressor Station | 0.0 | 10.0 | 7.2 | Algonquin would purchase a 61-acre site for the compressor station, of which 10.0 acres would be used for construction and 7.2 acres for operation. |
| Launcher Relocation | 0.6 | 0.5 | 0.0 | All work for the removal of the two launchers would be located within the fenceline of an existing Algonquin mainline valve and interconnect facility. |
| ISLANDER EAST | | | | |
| North Haven Meter Station | 0.0 | 0.8 | 0.8 | All work for construction of the meter station would be located within or adjacent to Algonquin's existing North Haven Meter Station. |
| Brookhaven Meter Station | 44.8 | 2.4 | 1.2 | Land required to operate the meter station is a subset of the land required to construct the meter station. |
| AES Calverton Meter Station | CA 5.6 | 1.8 | 0.3 | Land required to operate the meter station is a subset of the land required to construct the meter station. |

Note: Mainline valve mileposts were identified in table 2.1-2; valves have no land requirements.

### 2.2.2 Offshore

Islander East would not acquire a defined construction right-of-way across Long Island Sound. Where the pipeline is installed using typical offshore construction techniques (i.e., in water deeper than 10 feet), the primary work area for laying and burying the pipe on the sea floor would be approximately 80 feet wide, and roughly centered on the pipe. If a flotation channel for contractor vessels is needed (i.e., in water 10 feet deep or less at the Long Island Sound approach), the primary work area would be approximately 150 feet wide. Under the Connecticut nearshore waters of the Long Island Sound where horizontal directional drilling (HDD) would be conducted, the primary work area would be between 60 feet (for onshore to offshore drill) and 80 feet (for the offshore conventional pipe lay). The HDD is not expected to disturb the sea floor over the length of the drilled section. Approximately 3,000 acres of sea floor would be temporarily affected by construction of the pipeline trench. A detailed discussion of proposed offshore construction techniques is provided in section 2.3.3.

Ten feet of new permanent right-of-way would be required in Long Island Sound where the potential for lateral encroachment by other utilities or structures is generally reduced (as shown in table 2.2-1).

## 2.3 CONSTRUCTION PROCEDURES

The pipeline and aboveground facilities would be designed, constructed, operated, and maintained in accordance with the U.S. Department of Transportation (DOT) regulations in 49 CFR Part 192, "Transportation of Natural and Other Gas by Pipeline; Minimum Federal Safety Standards," and other applicable Federal and state regulations.

Islander East would implement the construction and restoration procedures identified in our *Upland Erosion Control, Revegetation, and Maintenance Plan* (Plan) and *Wetland and Waterbody Construction and Mitigation Procedures* (Procedures) with certain proposed modifications. The modified Plan and Procedures, hereafter called Islander East's Erosion and Sedimentation Control Plan (ESC Plan), is contained in appendix D and discussed in section 3.2 (Soils), section 3.3.2 (Surface Water), and section 3.7 (Wetlands).

During construction, Algonquin and Islander East would assign at least one environmental inspector for each active construction spread to monitor environmental compliance. All construction and contractor personnel would be required to attend environmental training before construction and periodically during construction. We would also inspect construction and restoration of the proposed project, independent of Algonquin and Islander East's environmental inspectors.

Islander East anticipates that construction for the offshore facilities would begin in the winter of 2002/2003. Algonquin and Islander East plan to commence their respective onshore work in late spring 2003. Table 2.3-1 summarizes the construction schedule for the Islander East Pipeline Project.

**TABLE 2.3-1**
**Construction Schedule**

| Facility | Location (mileposts) | Length (miles) | Schedule [a] |
|---|---|---|---|
| ALGONQUIN | | | |
| Launcher Relocation, Anomaly Investigations, & AGT Retest | 0.6, 3.8, 8.0 [b] | 0.3 | June 2003 – Aug. 2003 |
| Cheshire Compressor Station | 0.0 [b] | N/A | May 2003 – Oct. 2003 |
| ISLANDER EAST | | | |
| Connecticut Onshore [d] | 0.0 – 10.1 [c] | 10.1 | May 2003 – Dec. 2003 |
| Connecticut Onshore to Offshore HDD | 10.1 – 10.9 [c] | 0.8 | Nov. 2002 – Mar. 2003 |
| Connecticut and New York Offshore | 10.9 – 32.8 [c] | 21.9 | Dec. 2002 – April 2003 |
| New York Onshore [d, e] | 32.8 – 44.8 [c]<br>CA 0.0 – CA 5.6 [f] | 17.6 | May 2003 – Dec. 2003 |
| North Haven Meter Station | 0.0 [c] | N/A | June 2003 – Oct. 2003 |
| Brookhaven Meter Station | 44.8 [c] | N/A | June 2003 – Oct. 2003 |
| AES Calverton Meter Station | CA 5.6 [f] | N/A | June 2003 – Oct. 2003 |

a/ Restoration would continue through the end of 2003, or until cleanup and restoration are completed and revegetation requirements are met.
b/ Algonquin C-1 and C-1L Pipelines milepost.
c/ Islander East Pipeline milepost.
d/ Includes mainline valve construction.
e/ Includes the Islander East Pipeline and Calverton Lateral.
f/ Calverton Lateral milepost.
Note: N/A Not applicable.

## 2.3.1 General Onshore Construction Procedures

Before the start of onshore pipeline construction, Islander East would finalize land surveys; locate the pipeline centerline, construction right-of-way, and extra workspaces; and complete land or easement acquisition. If the necessary land rights or easements cannot be obtained through good faith negotiations with landowners and the project has been certificated by the Commission, Islander East may use the right of eminent domain granted to it under Section 7(h) of the NGA to obtain a right-of-way. Islander East would still be required to compensate the landowners for the rights-of-way, as well as for any damages incurred during construction. However, the level of compensation would be determined by the appropriate state or Federal court according to state laws. The Commission does not take part in these proceedings. The legal process and compensation established by eminent domain are not NEPA issues and lie beyond the scope of this EIS.

Onshore pipeline construction generally proceeds as a moving assembly line as shown in figure 2.3.1-1 and as summarized in the following section.

### 2.3.1.1 Right-of-Way Survey

The construction work area (e.g., nominal construction right-of-way, access roads, and extra work areas) would be surveyed and staked. Existing utility lines and sensitive resources identified in easement agreements or by Federal and state agencies would be located and marked to prevent accidental damage during pipeline construction.

### 2.3.1.2 Clearing and Grading

The construction right-of-way and temporary workspaces would be cleared of vegetation and other obstructions such as large rocks. Generally, stumps would be cut flush with the surface of the ground and left in place, except where necessary to create a safe and level work surface. Vegetation and stumps would be burned (if permitted), chipped, or hauled offsite to a commercial disposal facility. Chipped material would be spread across the work area in upland areas and incorporated into the soil. Merchantable timber would be limbed, cut, and stacked on the edge of the work area, used for timber riprap on wetland crossings, or removed in accordance with landowner or land management agency instructions.

Fences would be cut and braced, and rock from stone walks would be set aside until restoration. Temporary fences and gates would be installed as necessary. Sediment control devices such as silt fences and straw bales would be installed as necessary at wetlands, waterbodies, roads, and other areas during clearing.

After clearing, the construction right-of-way would be graded to create a safe and level work surface. In cultivated croplands and unsaturated wetlands, or where requested by the landowner or land management agency, topsoil would be stripped to a maximum depth of 12 inches over the trench line and subsoil storage area. Topsoil would be stored separate from subsoil along the edge of the construction right-of-way to prevent mixing of topsoil and subsoil. Additional temporary soil erosion control devices, such as temporary slope breakers, would be installed during grading.

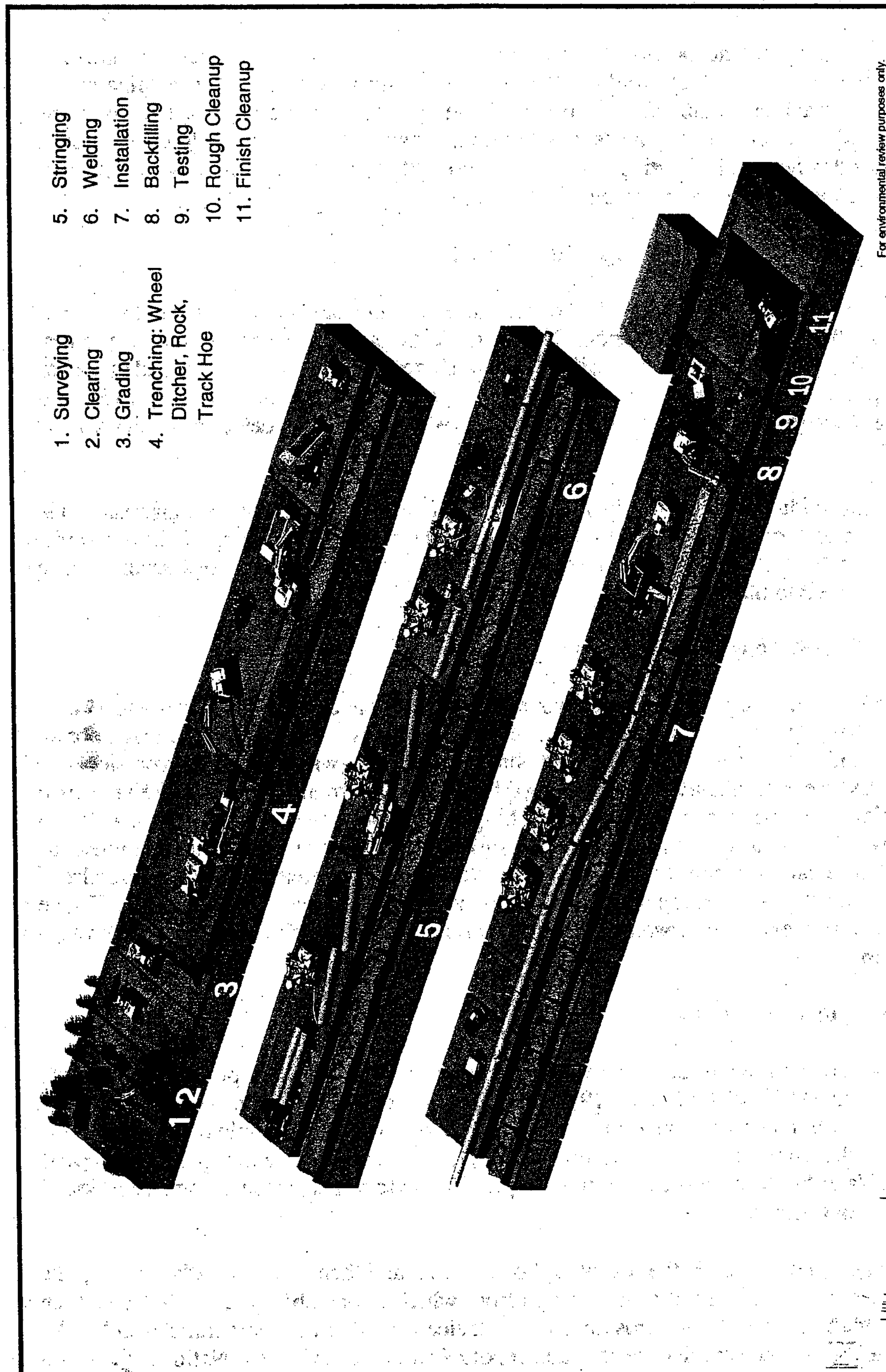


**Figure 2.3.1-1**
**Typical Onshore Construction Sequence**

### 2.3.1.3 Trenching

The pipe trench would be excavated using a backhoe or wheel-type ditching machine. Generally, the bottom of the trench would be 24 inches wider than the diameter of the pipeline (or 48 inches wide) and at a depth sufficient to provide 3 feet of cover over the pipeline (at least 5 feet total trench depth). In wet or sandy areas, a wider trench may be necessary to allow for unstable soils and a slopped trench wall. Blasting may occur where soil depth over hard rock is not sufficient to allow burial of the pipeline and maintain 3 feet of cover.

### 2.3.1.4 Pipe Stringing, Bending, and Welding

The epoxy coated pipe sections (also referred to as joints) would be delivered to the job site and strung along the excavated pipe trench. Individual sections of the pipe would be bent where necessary to fit the contours of the trench, aligned, welded together into long strings, and placed on temporary supports along the trench. In some cases, stringing would be completed before trenching. All welds would be x-rayed to insure structural integrity. Welds displaying defects would be cut out and re-welded.

Following welding, the previously uncoated ends of the pipeline at the welding joints would be coated with material compatible with the factory-applied coating. The coating on the remainder of the completed pipe sections would be inspected for defects and any damaged areas repaired prior to lowering the pipe into the trench.

### 2.3.1.5 Installation and Backfilling

Prior to lowering the pipe, the trench would be dewatered and cleared of debris and foreign material. The bottom of the trench may be padded with sand, gravel, screened soils, or sandbags. Trench barriers and breakers would be installed before backfilling (where necessary) on slopes to minimize the movement of subsurface water along the pipeline. The trench would then be backfilled with the material previously removed during trenching operations. In rocky areas, the pipe would be initially covered with a layer of rock-free pad dirt. Where possible, this material would be separated from the existing trench spoil by screening or imported to the area. In areas where bedrock is present, rock may be placed on top of the padding to the top of the natural bedrock profile. Where topsoil is stored separately from subsoil, the subsoil would be backfilled first and the topsoil would be placed on top.

### 2.3.1.6 Hydrostatic Testing

The pipeline would be filled with water and pressurized to design test pressure for 8 hours in accordance with DOT, 49 CFR Part 192, to verify its integrity and to ensure its ability to withstand the maximum designed operating pressure. Water from testing would be obtained from one or more of the waterbodies crossed by the project in accordance with applicable permit requirements. Water for the offshore portion of the project would be taken from Long Island Sound and returned to Long Island Sound.

Any leaks detected during the test would be repaired and then retested. After testing, the water would be discharged back into the sources from which it was obtained, either through an aeration type energy dissipater and erosion control device or into a transport trailer truck. All discharged water would be sampled, tested, and reported in accordance with National Pollution Discharge Elimination System (NPDES) requirements. No chemicals or additives would be used during hydrostatic testing. Test water used in the AGT Retest or in other piping that has previously been in gas service would be transferred into a series of large frac tanks and filtered before discharge onto the ground. See section 3.3.2 for a discussion of potential environmental impacts from hydrostatic testing.

#### 2.3.1.7 Cleanup and Restoration

Within 10 days of backfilling, weather and soil conditions permitting, all remaining trash, debris, and surplus materials would be removed from the right-of-way and disposed of at appropriate facilities. All disturbed areas would be finish-graded and, as closely as possible, restored to preconstruction contours. In upland areas a slight crown would be formed over the trench to compensate for settling of the backfill. Permanent erosion control devices would be installed and disturbed work areas would be revegetated.

Restoration would begin within 6 days of final grading, weather and soil conditions permitting, and the construction work areas would be seeded, limed, and fertilized in accordance with landowner or land management agency requests or as recommended by the local office of the Natural Resource Conservation Service (NRCS).

### 2.3.2 Special Onshore Construction Techniques

#### 2.3.2.1 Agricultural Areas

Landowners would be compensated for crop loss and other damages. Topsoil would be stripped to a maximum depth of 12 inches over the trench line and subsoil storage area. Topsoil would be stored separately from subsoil along the edge of the construction right-of-way to prevent the mixing of topsoil with subsoil in actively cultivated agricultural areas to minimize impacts on future crop production. In areas where topsoil is less than 12 inches deep, an effort would be made to separate the actual amount of topsoil. During backfilling, subsoil would be backfilled first and the topsoil replaced on top.

Topsoil and subsoil would be tested for compaction at regular intervals and compared with soil in undisturbed areas to identify approximate preconstruction conditions. Subsoils of severely compacted agricultural soils would be plowed before replacing topsoil in areas where topsoil has been segregated. Alternatively, arrangements may be made with the landowner to plant and plow under a green manure crop, such as alfalfa, to decrease soil bulk density and improve soil structure.

After construction, crop growth would be monitored for 2 years to determine whether the crops have returned to expected productivity. Croplands, except those within the operational areas of aboveground facilities, would be allowed to return to agricultural use after construction.

#### 2.3.2.2 Residential, Commercial, and Industrial Areas

Where residences or businesses are within 50 feet of the work area, orange safety fences would be installed along the edges of the work area for a distance of 100 feet on either side of the residence or business; mature trees and landscaping would be preserved to the maximum extent possible; and construction would be conducted as quickly as possible. During backfilling, subsoil would be backfilled first and the topsoil replaced on top. Topsoil replacement may be used in lieu of topsoil separation.

Where residences or businesses are closer than 25 feet from the work area, either the "drag section" or "stove pipe" construction technique may be used near the residences or businesses. The drag section technique requires little or no trench to be left open at the end of the day and is often used where the construction right-of-way is narrow. The drag section involves fabricating the pipeline before trenching. After the pipeline is fabricated, a trench just large enough to accommodate the pipe is excavated. The pipe is then lowered in the trench and welded into place. At the end of the day, the trench is backfilled except for the last part of newly installed pipe which may be covered with steel plates or timber mats.

The stove pipe construction technique involves installing one joint pipe at a time. At the beginning of the day, a trench is excavated where construction left off the day before. After the trench is dug, single joints of pipe are lowered in the trench and welded onto the line one by one until, at the end of the day, the trench is backfilled. As with the drag section technique, the last section of newly installed pipe is often not buried, but is covered with steel plates or timber mats.

During restoration, lawns would be reseeded in accordance with landowner requirements or, absent a specific requirement, with a seed mix similar to the adjoining undisturbed lawn. Landowners would be compensated for damages to ornamental shrubs and other landscape plantings. Islander East proposed that compaction testing and mitigation would not be performed in residential areas disturbed by construction. However, we believe that additional monitoring would be required to provide adequate protection to residential soils, as discussed in section 3.2.2.

#### 2.3.2.3 Steep Slopes

Additional grading may be required in areas where the pipeline runs up and down steep slopes to accommodate the bending limitations of the pipe. In such areas, the slopes would be cut away, and, after the pipeline is installed, reconstructed to their original contours during restoration.

In areas where the project runs laterally along the side of a slope (side slope), additional grading may be required. Generally, on steep side slopes, soil from the high side of the right-of-way would be moved to the lower side of the right-of-way to create a safe and level terrace. After the pipeline is installed, the soil from the low side of the right-of-way would be returned to the high side, and the slope's original contours would be restored.

#### 2.3.2.4 Blasting

Blasting may be necessary where bedrock is encountered. Blasting would be performed by registered licensed blasters who would be required to secure necessary permits and comply with legal requirements in connection with the transportation, storage, and use of explosives, and blast vibration limits for nearby structures and utilities. See section 3.1.1.2 of the EIS for more details on blasting requirements and procedures for the project.

#### 2.3.2.5 Roads and Railroads

Roads and railroad crossings would be conducted using conventional upland construction procedures with modifications. Road crossing construction would be completed as quickly as possible (typically less than 24 hours), and roads would be restored to a condition similar to preconstruction immediately following installation. In some cases, a temporary bridge or bypass may be established on small roads and driveways, or one lane may be closed at a time with traffic diverted to other lanes. Additional temporary workspaces generally would be required at conventional road crossings.

Higher traffic roads and railroads would be horizontally bored and remain open to traffic. Horizontal boring involves excavating an access pit on both sides of the road, boring a hole under the road from one access pit to the other, and installing a prefabricated segment of pipeline through the hole. Additional temporary workspaces would be required at horizontal bored crossings to accommodate excess spoil excavated from the bore pits and to allow prefabrication of the pipeline segment to be installed under the road.

The hammer method is an alternative to the horizontal boring method. An access pit would be excavated on both sides of the road. Instead of boring a hole under the road from one access pit to the other, a pneumatic pile driver is used to pound a casing pipe that is slightly larger in diameter than the proposed pipeline under the road. Once the casing is in place, soil is removed from the casing and the pipeline is installed. The casing may either be removed or left in place.

#### 2.3.2.6 Other Utility Lines

Prior to excavation, the pipeline construction contractor would call each state's one-call system to identify buried utilities within the project area. The proposed pipeline typically would be installed with at least 18 inches of separation between the pipeline and the foreign utility. Where 18 inches of separation is not possible, additional precautions would be taken, such as installing a concrete barrier between the pipeline and the utility.

#### 2.3.2.7 Wetlands

Construction across wetlands would be similar to typical construction procedures described above, with several modifications and limitations to reduce the potential for pipeline construction to affect wetland hydrology and soil structure. Specific impacts to wetlands along the proposed project right-of-way are discussed in section 3.7.2 of the EIS.

**Additional Temporary Workspaces**

Additional temporary workspaces would be required on both sides of wetlands in upland areas a minimum of 50 feet from the wetland edge to stage construction, fabricate the pipeline, and store materials. Additional information of temporary workspaces associated with wetlands can be found in secton 3.7.1 of the EIS.

**Equipment**

Construction equipment working in wetlands would be limited to that essential for right-of-way clearing, excavating the trench, fabricating and installing the pipeline, backfilling the trench, and restoring the right-of-way. In areas where there is no reasonable access to the right-of-way except through the wetlands, non-essential equipment would be allowed to travel through wetlands only once prior to installation of mats.

Equipment refueling and lubricating would take place in upland areas that are more than 100 feet from wetlands. In certain instances, equipment refueling and lubricating may be necessary near or in wetlands. For example, stationary equipment, such as water pumps for trench dewatering, may need to be operated continuously in wetlands and may require refueling in place.

Sediment barriers such as silt fence and staked straw bales would be installed and maintained adjacent to wetlands, within additional temporary workspaces, and across the full width of the construction right-of-way at wetland boundaries at the base of slopes to minimize the potential for sediment runoff.

Trench dewatering water would be discharged into an energy dissipation/sediment filtration device, such as a geotextile filter bag or straw bale structure to minimize the potential for erosion and sedimentation.

**Construction**

Construction would occur in a manner similar to upland construction techniques previously described where wetland soils are not saturated at the time of construction. Equipment mats or timber riprap would be used as needed in wetlands to support equipment and reduce soil compaction and mixing. Where wetland soils are unstable or inundated, the pipeline may be installed using the push-pull technique that involves stringing and welding of the pipeline away from the wetland and excavating and backfilling the trench using a trackhoe supported by equipment mats. The pipeline would be installed by floating the prefabricated pipeline across the wetland.

Most pipe installed in saturated wetlands would be coated with concrete or equipped with set-on weights to provide negative buoyancy and keep the pipeline from "floating" to the surface after the trench is backfilled. Concrete coating would generally be conducted in upland areas at least 100 feet away from wetlands. However, where wetlands are not saturated enough to allow floating the completed pipeline across the wetland, the ends of each pipe segment cannot be coated with concrete until after it is strung alongside the trench and welded together. As a result, a minimum amount of concrete coating is required in and near wetlands. Algonquin and Islander East have prepared a Spill Prevention, Control and Countermeasure Plan (SPCC Plan) to address the handling of concrete and other materials in or within 100 feet of wetlands.

**Restoration**

Restoration of contours would be accomplished during backfilling. Topsoil would be replaced to the original ground level leaving no crown over the trench line. Equipment mats and timber riprap would be removed from wetlands following backfilling.

In some situations, the backfilled pipeline trench could provide a conduit for subsurface water flow and could result in subsurface erosion or the draining of wetlands. Prior to backfilling, trench breakers would be installed where necessary to prevent the subsurface flow of water.

Where wetlands are located at the base of slopes, permanent slope breakers would be constructed across the right-of-way adjacent to the wetland boundary. Temporary sediment barriers would be installed where necessary until revegetation of adjacent upland areas is successful. Once revegetation is successful, sediment barriers would be removed from the right-of-way and disposed of properly.

In non-cultivated wetlands where no standing water is present, the construction right-of-way would be seeded with appropriate agency recommendations, or in the absence of recommendations, annual ryegrass at a rate of 40 pounds per acre. Lime, mulch, and fertilizer would not be used in wetlands.

Natural regeneration of forested wetlands is considered preferable to planting trees, shrubs, and grasses and is proposed for this project. This is discussed further in section 3.7.2.

### 2.3.2.8 Waterbodies

The Islander East Pipeline Project would cross 14 waterbodies (excluding the Sound) that would require using one of several special construction techniques to minimize construction impacts on waterbodies. Construction methods for stream crossings are described below.

**Additional Temporary Workspaces**

In general, additional temporary workspaces would be required on both sides of waterbodies in upland areas at least 50 feet from the waterbody edge to stage construction, fabricate the pipeline, and store materials. However, there would likely be some locations where workspaces would need to be situated less than 50 feet from a waterbody or even within a waterbody.

**Equipment**

Prior to construction, temporary bridges would be constructed across all waterbodies to allow construction equipment to cross. Construction equipment would be required to use the bridges, except the clearing crew who would be allowed one pass through the waterbodies before the bridges are installed. Bridges and supports would be removed after restoration is complete. Where bridges are not installed at state-designated fishery streams, equipment would be required to move around the waterbodies to gain access to the other side.

In general, equipment refueling and lubricating would take place in upland areas that are more than 100 feet from the edges of waterbodies. There would be certain instances where equipment refueling and lubricating may be necessary in or near waterbodies. For example, stationary equipment, such as water pumps for hydrostatic test water, may need to be operated continuously on the banks of waterbodies and may require refueling in place. Algonquin and Islander East have prepared an SPCC Plan to address the handling of fuel and other materials in or within 100 feet of waterbodies.

**Clearing**

Clearing would involve the removal of trees and brush from the construction right-of-way and additional temporary workspaces. Woody vegetation would be cleared to the edge of the waterbodies, but a 50-foot-long herbaceous strip would be left on the approaches until immediately before construction to provide a natural sediment filter and minimize the potential for erosion immediately adjacent to the waterbodies. Initial grading of the herbaceous strip would be limited to the extent needed to install bridges.

During clearing, sediment barriers would be installed and maintained adjacent to waterbodies and within additional temporary workspaces to minimize the potential for sediment runoff. Silt fence and/or staked straw bales would be installed across the full width of the construction right-of-way immediately after clearing. Silt fence or straw bales located across the working side of the right-of-way would be removed during the day when vehicle traffic is present and would be replaced each night. Alternatively, drivable berms may be installed and maintained across the right-of-way in lieu of silt fence or straw bales.

**Construction**

To minimize the possibility of construction interfering with fish migration and spawning, in-stream construction in coldwater fisheries would be conducted between June 1 and September 30, and in-stream construction in coolwater and warmwater fisheries considered significant by the state would be conducted between June 1 and November 30. Other time windows may be used if permitted or required by state agencies. These and other measures to minimize impacts on fisheries resources are discussed in section 3.4.1.2 of the EIS.

Horizontal Directional Drill Crossing Method

Islander East proposes to cross one waterbody, the Carmans River at milepost (MP) 43.2, using the HDD method. As proposed, the length of the drill would be approximately 1,450 feet. Islander East presently assumes that drilling the Carmans River should be feasible because a nearby KeySpan Energy Delivery gas main was installed under the river using the same method.

The HDD crossing method would involve drilling a hole under the waterbody and installing a prefabricated segment of pipe through the hole (see figure 2.3.2-1). The first step in HDD would be to drill a small-diameter pilot hole from one side of the crossing (entry side) to the other (exit side). Drilling is achieved using a hydraulic powered drill bit. The drilling fluid, commonly referred to as mud, is a mixture of water and bentonite (a naturally occurring clay mineral) which would be pumped into the drill hole throughout the drilling process. The pressure of the drilling mud transmits hydraulic power to turn the drill bit, stabilizes the drill hole, transports cuttings to the surface, and lubricates the drill bit. Water, the main ingredient of drilling mud, would be obtained from the waterbody during drilling or would be trucked in from a commercial source. Small pits would be dug at or near the entry and exit holes to temporarily store the mud and cuttings. The mud and cuttings would be pumped from the temporary storage pits to an on-site recycling unit where mud would be processed for reuse.

As drilling the pilot hole progresses, segments of drill pipe would be inserted into the pilot hole to extend the length of the drill. Once the pilot hole is complete, the hole would be enlarged to accept the pipeline. To enlarge the pilot hole, a larger reaming tool would be attached to the end of the drill on the exit side of the hole. The reamer would then be drawn back through the pilot hole to the drill rig. Drill pipe sections would be added to the reamer as it progresses toward the rig, thereby allowing a string of drill pipe to remain in the hole at all times. Typically, several passes of consecutively larger reaming tools are required before the hole is of sufficient size. The final hole would be approximately 12 inches larger than the pipeline to be installed (or approximately 36 inches in diameter).

The pipeline segment to be installed beneath the waterbody would be fabricated on the right-of-way on the exit side of the crossing. After the hole is completed, the pipeline segment would be attached to the drill string on the exit side of the hole and pulled back through the drill hole toward the drill rig. The pipe segment would be radiographically inspected and hydrostatically tested prior to installation.

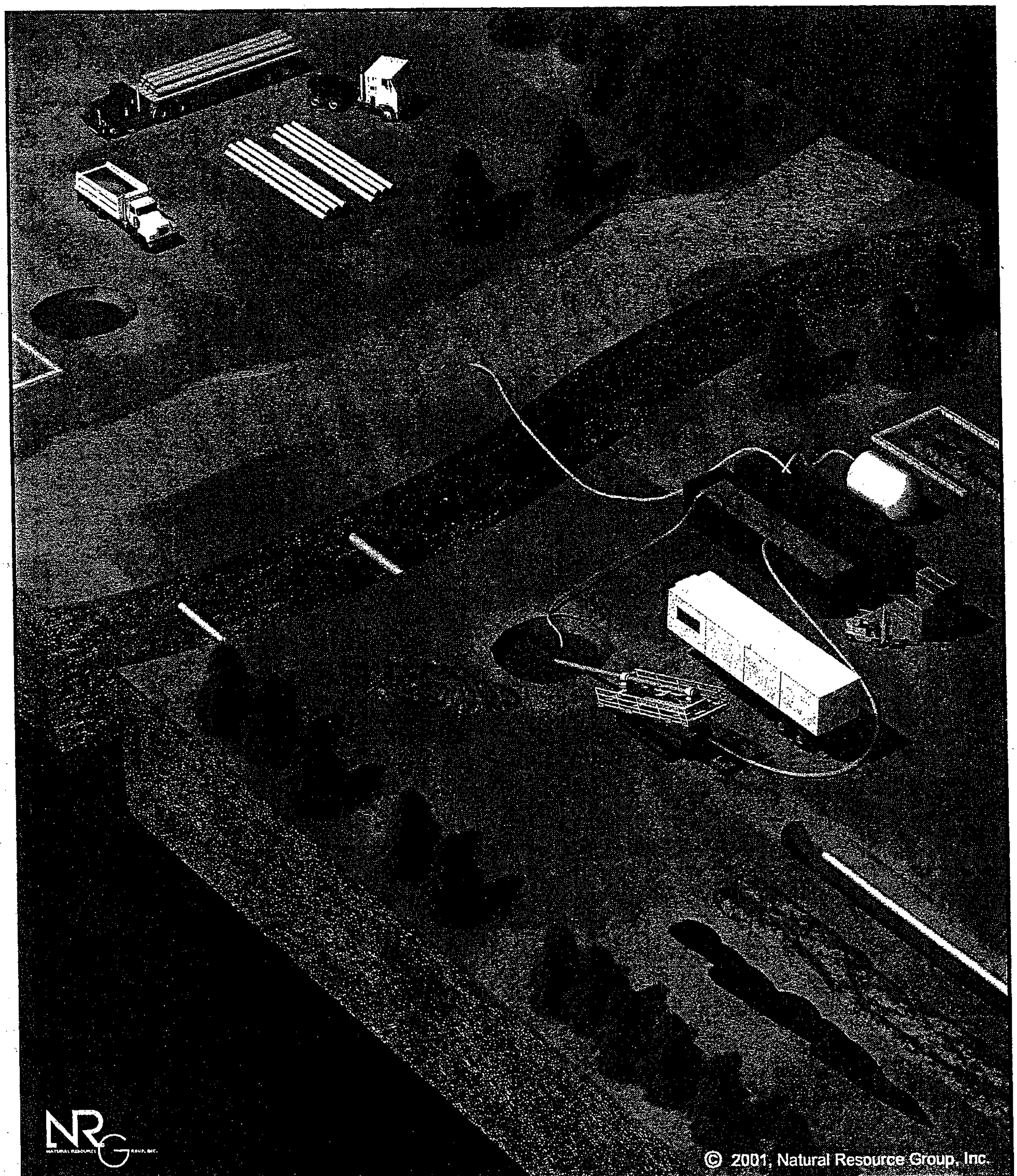


**Figure 2.3.2-1**
**Typical Horizontal Directional Drill Construction**

Once the pipeline is installed, excess drilling mud would be collected and incorporated into the soil in an upland area or disposed of at an appropriate facility. If water is left over from the drilling process, it would be discharged into a well-vegetated upland area or into an energy dissipation/sediment filtration device, such as a geotextile filter bag or straw bale dewatering structure at the site.

Ideally, HDD involves no disturbance to the bed or bank of the waterbody being crossed. However, if a natural fracture or weak area in the ground is encountered, an unexpected release of drilling mud to the environment could occur. This is called a "frac-out".

Releases to the ground generally occur above or near the drill path. If a wetland or waterbody is nearby, drilling mud could be released into the wetland or waterbody. In the event drilling mud is released to a wetland, Islander East would construct a small pit at the release site to contain its spread, and a pump would be used to transfer the drilling mud from the pit and into a containment vessel.

In the event of a release to a waterbody, an attempt would be made to plug the fault by adding thickening agents to the drilling mud, such as additional bentonite, cotton seed hulls, or other non-hazardous materials that are compatible with the drill equipment being used. Potential impacts of drilling mud releases are discussed in section 3.3.2.2 and 3.3.3.2.

In cases where drilling fails, construction would be completed using one of the alternative crossing methods described below.

<u>Flume Crossing Method</u>

Islander East proposes to cross all 12 waterbodies in Connecticut using the flume crossing method. This method involves diverting the flow of the stream across the construction site through one or more flume pipes placed in the stream (see figure 2.3.2-2). The first step in the flume crossing method involves placing a sufficient number of adequately sized flume pipes in the stream to accommodate the highest anticipated flow during construction. After placing the pipes in the stream, sand or pea gravel bags would be placed in the stream upstream and downstream of the proposed trench. The bags serve to dam the stream and divert the stream flow through the flume pipes, thereby isolating the stream flow from the construction area.

Trackhoes on both banks of the stream would excavate a trench under the flume pipe in the isolated streambed. Spoil excavated from the stream trench would be placed or stored a minimum of 10 feet from the edge of the waterbody for temporary storage. Once the trench is excavated, a prefabricated segment of pipe would be installed beneath the flume pipes. The trench would then be backfilled with native spoil from the streambed. Clean gravel or native cobbles would be used to backfill the top 12 inches of the trench in coldwater fisheries.

If trench dewatering is necessary near waterbodies, the trench water would be discharged into an energy dissipation/sediment filtration device, such as a geotextile filter bag or straw bale structure, away from the water's edge to prevent heavily silt-laden water from flowing into the waterbody.

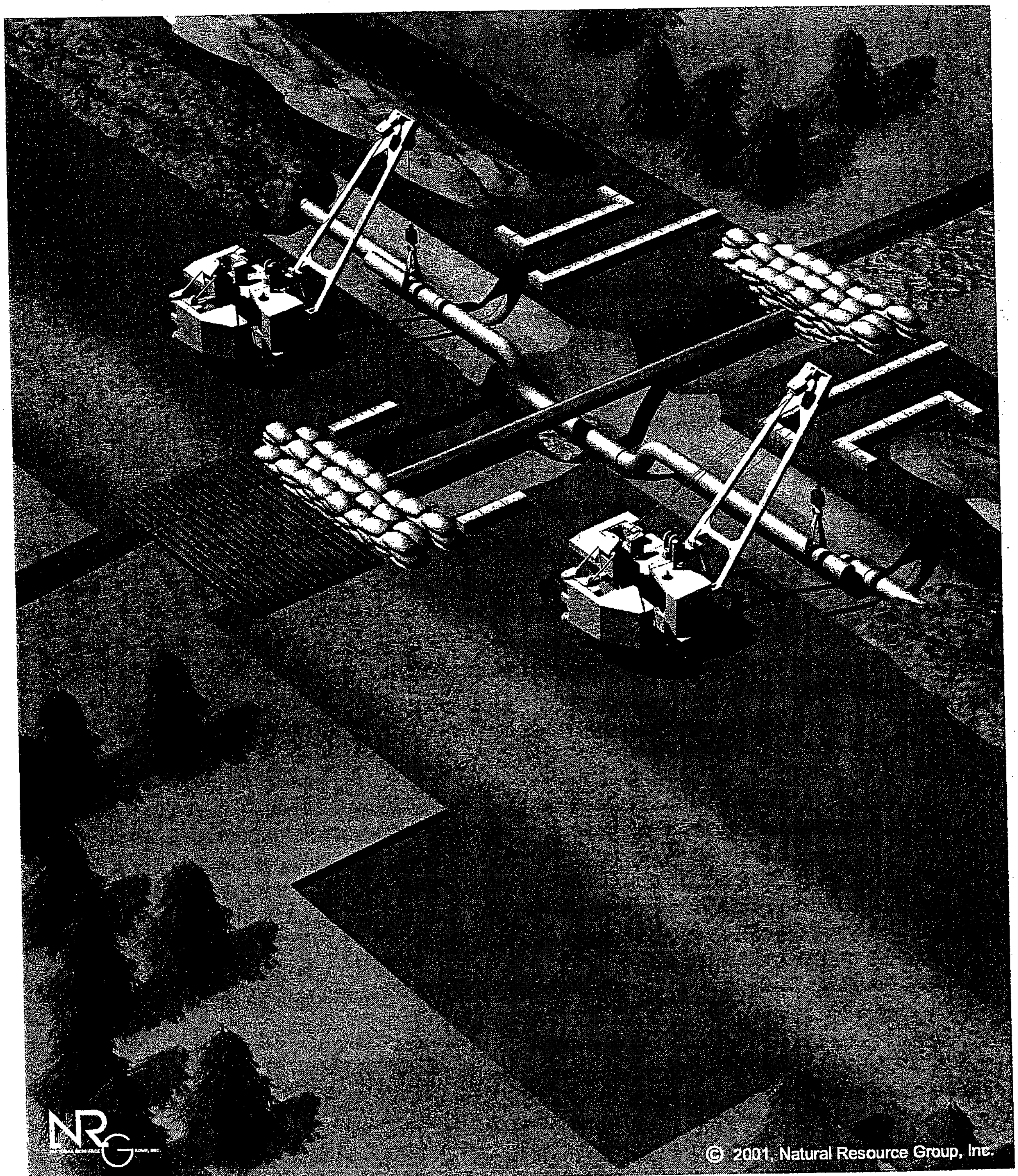


**Figure 2.3.2-2**
**Typical Flume Construction**

Dam and Pump Crossing Method

At this time, none of the waterbodies crossed by the Islander East Pipeline Project are proposed to be constructed using the dam and pump crossing method. However, a discussion of this method is included in this EIS in the event that engineering studies determine the dam and pump method would be preferable to the flume method in some instances. The dam and pump crossing method involves constructing temporary sand or pea gravel bag dams upstream and downstream of the proposed crossing site while using a high capacity pump to divert water from the upstream side around the construction area to the downstream side. Energy dissipation devices, such as plywood boards, would be placed on the downstream side at the discharge point to prevent streambed scour.

After installing the dams and commencing pumping, a portable pump (separate from that pumping the stream flow around the construction area) may be used to pump standing water from between the dams into a dewatering structure consisting of straw bales/silt fence or into a geotextile filter bag located away from the stream banks, thereby creating a "dry" construction area.

Once the area between the dams is stable, backhoes on both banks would excavate a trench across the stream. Spoil excavated from the trench would be stored in a straw bale/silt fence containment area located a minimum of 10 feet from the edge of the stream banks. Leakage from the dam, or subsurface flow from below the streambed, may cause water to accumulate in the trench. As water accumulates in the trench, it may be periodically pumped out and discharged into a dewatering structure located away from the stream banks.

After trenching across the streambed is complete, a prefabricated segment of pipe would be installed in the trench. The streambed portion of the trench is immediately backfilled with streambed spoil. Clean gravel or native cobbles would be used to backfill the top 12 inches of the trench in all coldwater fisheries.

Wet Trench Crossing Method

Islander East proposes to cross one waterbody, the Peconic River at MP 38.5 (a warmwater fishery), using the wet trench crossing method which involves trenching through a stream while water continues to flow (see figure 2.3.2-3). After clearing the stream approaches and installing sediment control measures, trackhoes would excavate a trench in the flowing stream from both banks of the waterbody. Spoil excavated from the trench would be placed a minimum of 10 feet from the edge of the waterbody for temporary storage. Earthen trench plugs would be left in place on both banks of the waterbody until immediately before pipe installation to separate the river trench from the upland trench. Trench plugs prevent muddy water that accumulates in the upland trench from flowing into the stream.

Once the trench is excavated, a prefabricated segment of pipe would be installed in the trench. The trench would then be backfilled with native streambed spoil.

**Restoration**

At streams crossed using the wet trench, flume, or dam and pump techniques, stabilization would begin within 24 hours of backfilling. Original streambed and bank contours would be re-established, and mulch, jute thatching, or bonded fiber blankets would be installed on stream banks. Where the flume technique is used, stream banks would be stabilized before removing the flume pipes and returning flow to the waterbody channel.

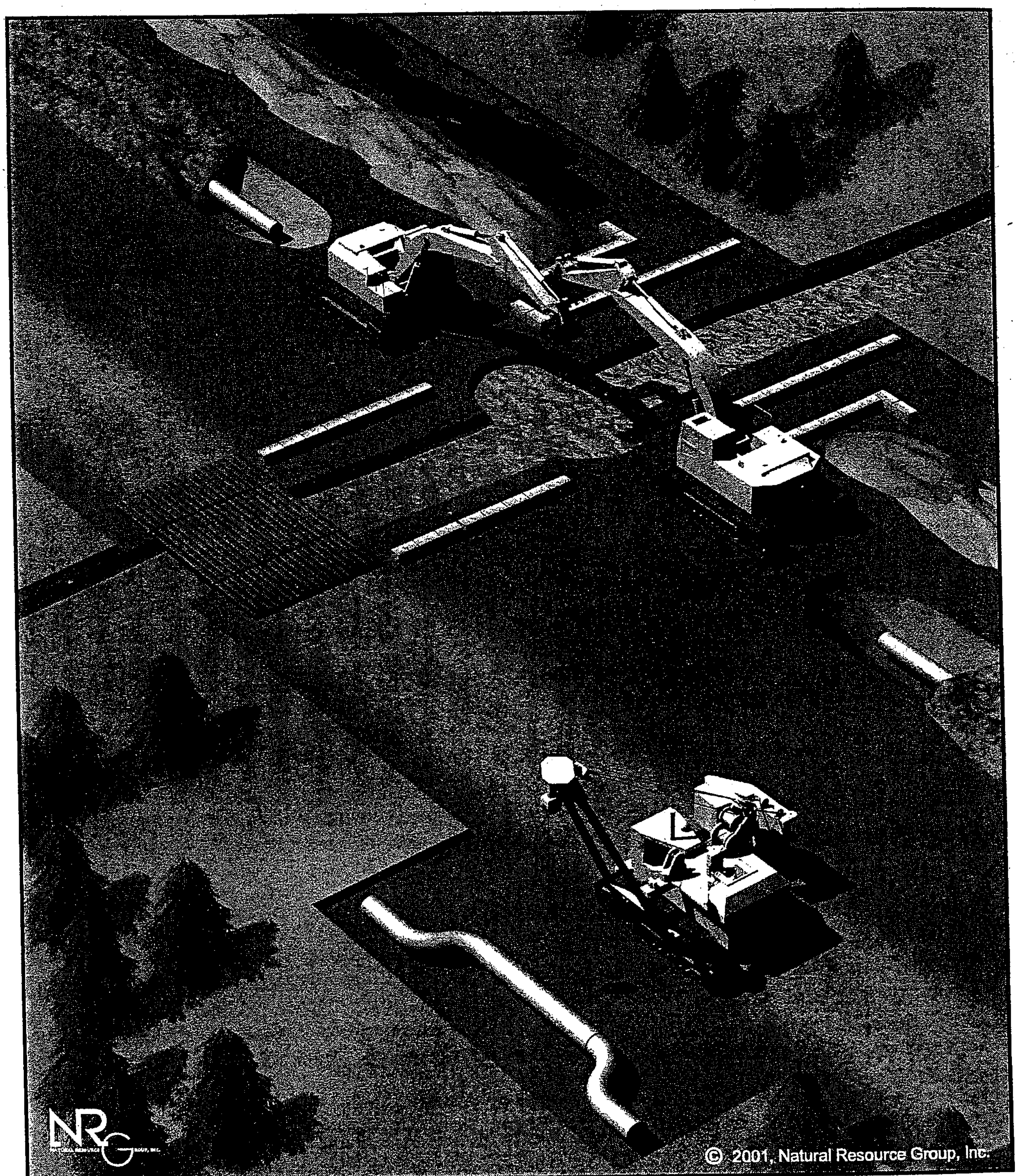


**Figure 2.3.2-3**
**Typical Wet Trench Construction**

Seeding of disturbed stream approaches would begin within 6 days of final grading, weather and soil conditions permitting. Where necessary, slope breakers would be installed adjacent to stream banks to minimize the potential for erosion. Sediment barriers, such as silt fence and/or straw bales would be maintained across the right-of-way until permanent vegetation is established. Temporary equipment bridges would be removed following construction.

#### 2.3.2.9 Algonquin Pipelines Retest

Pipe retests and upgrades typically involve hydrostatic testing and recommissioning of existing pipelines. To upgrade, the pipe would be taken out of service and the natural gas purged from its interior. Then the pipeline would be excavated at select locations, a short section of the pipe would be cut out, and hydrostatic test manifolds would be attached to the pipeline. The manifolds seal off the open ends of the pipeline and serve as apertures for filling and draining the pipeline and as attachment points for testing equipment and gauges.

As described in section 2.3.1.6, the pipeline would be filled with water and pressurized. The water would be held at a set pressure for a minimum of 8 hours to verify the strength and integrity of the pipe wall and welds.

Water for the testing would be obtained from the Quinnipiac River (with agency approval) at the first crossing of this river by the existing Algonquin C-1 and C-1 L pipelines near MP 8.9. Alternatively, the water may also be trucked in from a municipal source. After testing is completed, test water used in the retest sections or in other piping that has previously been in gas service would be transferred into a series of large frac tanks and filtered through commercial carbon filtering equipment before being discharged to a well-vegetated, upland area. Discharged water would be sampled, tested and reported according to NPDES requirements. No chemicals or additives would be used during the cleaning or testing of the pipelines.

In the unlikely event that the pipeline does not pass the hydrostatic test, portions of the pipeline may need to be exposed, repaired, and retested. Dig ups, repairs, and restoration would be conducted under Algonquin's emergency procedures in a manner similar to pipe anomaly investigation work described in the following section.

#### 2.3.2.10 Anomaly Investigations

Algonquin identified two locations on its existing 10-inch-diameter C-1 pipeline where existing segments of pipe would need to be exposed, inspected, and repaired as necessary. Anomaly investigations would require excavating a trench approximately 10 feet wide (at the bottom of the trench) and 8 feet deep along the length of each segment of pipe to be investigated. The width of the top of the trench would vary depending on soil conditions, but in stable soils can be estimated at 20 feet wide.

The existing pipeline would be taken out of gas service and depressurized prior to excavation and inspection of the pipe. If the pipe meets established criteria for remaining wall thickness and condition, the coating would be repaired and the area backfilled and restored as described in sections 2.3.1.5 through 2.3.1.7. If the pipe does not meet these criteria, that section of the pipeline would be cut out and replaced. A replacement pipe section would be fabricated to match the pipe being removed, the old pipe would be cut out and the new section would be welded in place and radiographically inspected. Following replacement, the pipe coating would be repaired and the area backfilled and restored.

## 2.3.3 Typical Offshore Construction Procedures

The Islander East Pipeline Project would cross the Sound and would require deepwater construction techniques to install the pipeline. Deepwater construction typically uses two barges working in tandem to install the pipeline: the lay barge and the bury barge. The lay barge welds the pipeline together and sets it on the sea floor. The lay barge is followed by the bury barge, which excavates a trench under the pipeline and, at least partially, buries the line to complete the installation. Alternatively, the lay barge may be used to perform both functions, first welding and laying the pipe and then returning along the pipeline to bury it. Islander East would require contractor vessels to comply with the National Invasive Species Act of 1996 and other applicable regulatory requirements regarding introduction of exotic marine organisms. Potential sedimentation and acreage disturbances associated with each offshore construction technique are discussed in section 3.3.3.2 of this EIS.

### 2.3.3.1 Lay Barges

Lay barges are complete seagoing construction facilities that typically remain offshore for the duration of the project. Lay barges can vary in size, but a typical lay barge may be 400 feet long by 120 feet wide. Fuel, pipe, workers, and supplies are delivered to the lay barge by various types of service vessels. Figure 2.3.3-1 illustrates typical offshore pipeline construction using a lay barge.

The Sound mainline would be assembled and lowered onto the sea floor from a slow moving lay barge. An assembly line of welding, coating, and inspection stations would be set up on the lay barge deck. As the pipeline is fabricated, it would be slowly lowered over a ramp equipped with a pipe guide (also referred to as a stinger) and into the water. The pipeline would be coated with high-density concrete to overcome buoyancy so that it can sink into place. The stinger would help guide the pipeline to the sea floor at the proper angle. Pontoons are sometimes attached to the pipe to prevent cracking of the concrete coating or buckling of the pipe as it is lowered. The pontoons would be control-flooded and would lower the line to the sea floor at an angle that does not overstress the pipeline. Tensioners may be used in deep water to maintain an upward force so that the pipe does not buckle under its own weight. As supplies of pipe run low on the lay barge, pipe barges would deliver additional joints from onshore storage yards.

Lay barges are typically moored in place and propelled by winches attached by cable to an array of large anchors. The lay barges to be used on the Islander East Pipeline Project may have between 8 and 12 anchors, each approximately 15 feet wide. The anchors are designed to penetrate several feet into sea floor sediments to gain hold when the cables are tensioned. The maximum extent of the mooring anchor array would be approximately 2,500 feet to the front and back of the barge, and approximately 2,000 feet to either side. As the lay barge advances, tugboats lift the anchors from the sea floor and reposition them at half-mile intervals in the direction of movement. The lay barge changes position relative to the anchors as the cables are taken up and let out.

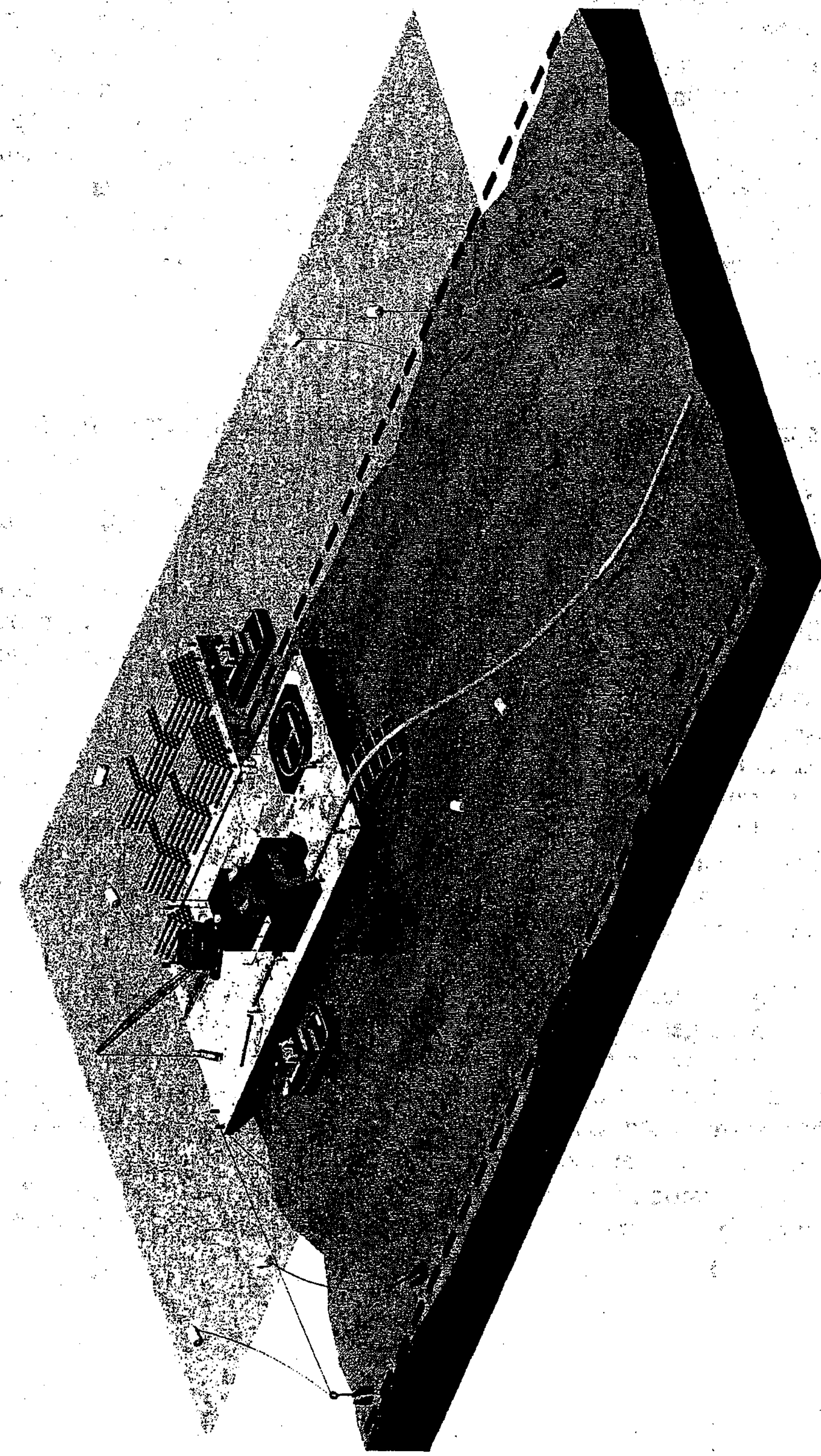



**Figure 2.3.3-1**
**Typical Offshore Pipeline Lay Barge**

#### 2.3.3.2 Bury Barge

In general, the pipeline would be concrete coated and buried a minimum of 3 feet below the sea floor in no more than 12 feet of water. In areas over 12 feet, the pipeline would be concrete-coated and buried to at least one-half its diameter, or deeper as determined after consultation with state permitting agencies. Installing the pipeline in this manner would satisfy DOT safety requirements and would minimize impacts on bottom-fishing activities such as trawling, urchin dragging, oystering, and lobstering. Where the pipeline crosses foreign utilities or submerged bedrock outcrops, the pipeline may be laid on the surface of the sea floor and armored with stone rip-rap or concrete mats.

The subsea plow is Islander East's preferred installation method to bury the pipeline beneath the sea floor, and would be used in water greater than 20 feet deep (see figure 2.3.3-2). A cross-section of the plow trench is shown in figure 2.3.3-3. The subsea plow would be positioned over the pipeline and would ride along the sea floor on pontoons. The subsea plow physically cuts the sea floor and casts excavated spoil on the side of the trench. The plow would push sediment from the trench approximately 25 feet to either side of the trench. Islander East estimates the trench to be about 25 feet wide at the top. The backfill plow would replace the excavated material back over the pipeline.

Islander East would use a bury barge equipped with a subsea jetting sled if plowing equipment is not available (see figure 2.3.3-4). A cross-section of the jet sled trench is shown in figure 2.3.3-5. Bury barges can vary in size, but a typical bury barge may be 400 feet long by 120 feet wide. The jetting sled would be used in water grater than 20 feet deep. It would be positioned over the pipeline on the sea floor and would be moved via the anchored bury barge. The jetting sled uses high-pressure water to rapidly remove the sea floor under the pipeline, which settles into the trench created by the jetting action. To achieve the required burial depth, multiple passes of the jetting sled may be required. Cohesive silts and clays are typically the easiest soils to jet and usually maintain a relatively narrow trench with vertical walls. For much of the pipeline route, the trench produced is estimated to be 40 feet wide at the top. Non-cohesive silts and sands generally would result in wider trenches with more gradually sloped walls. Backfilling of the trench would be accomplished by settling of the trench walls and natural sedimentation. Divers would make regularly scheduled dives in order to monitor the depth of the pipeline during jetting and to inspect the condition of the jetting sled.

### 2.3.4 Special Offshore Construction Procedures

Construction of the Connecticut and Long Island approaches and construction across foreign utility lines would require special offshore construction procedures.

#### 2.3.4.1 Connecticut Mainland Approach

Islander East plans to use the HDD technique to install an approximate 4,000-foot-long segment of the pipeline at the mainland approach to Connecticut (MP 10.1 to 10.9). The drill rig and support equipment would be set up at a 120-foot-wide by 400-foot-long workspace approximately 700 feet from the edge of the water.

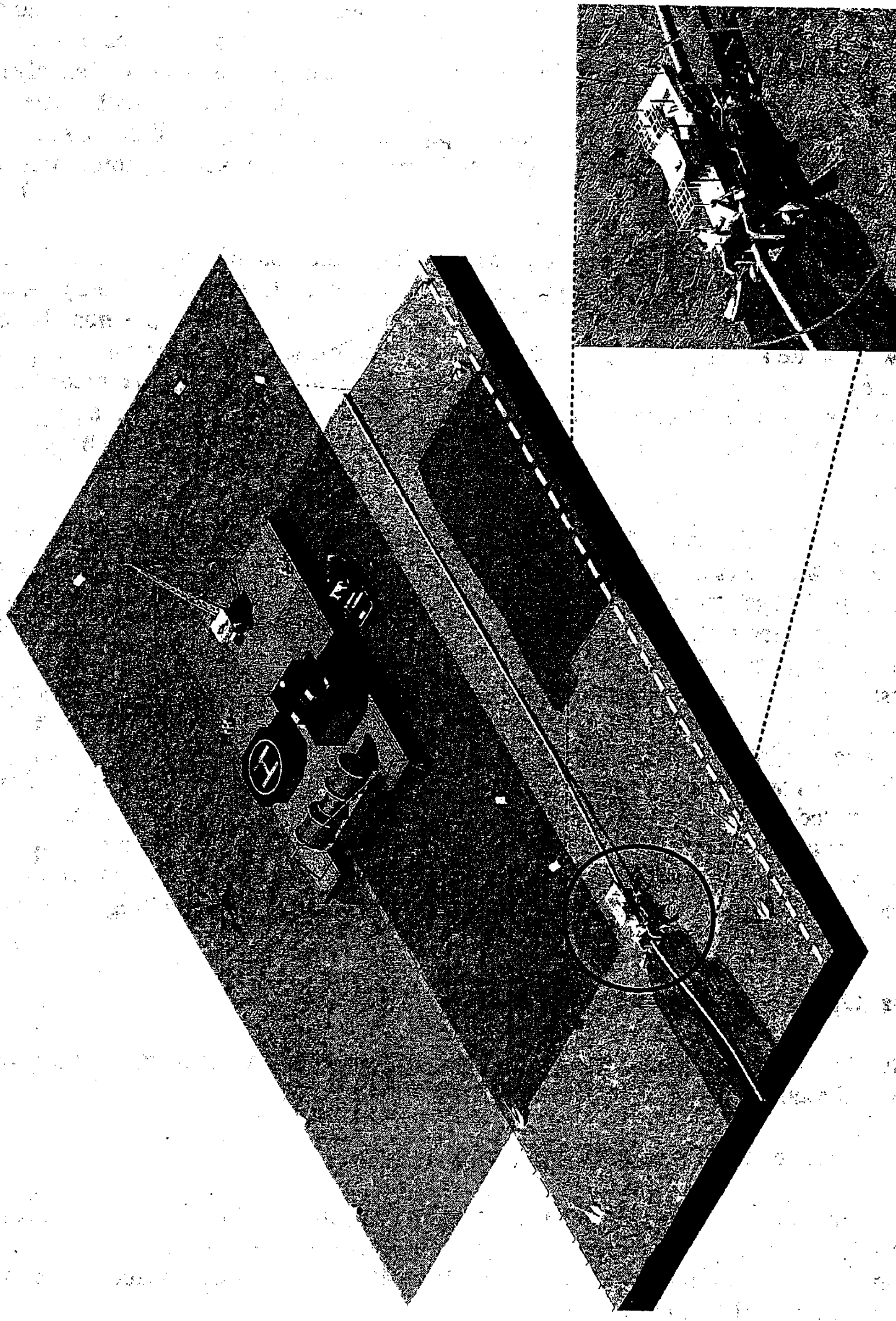

**Figure 2.3.3-2**
**Typical Offshore Pipeline Bury Barge (Subsea Plow)**

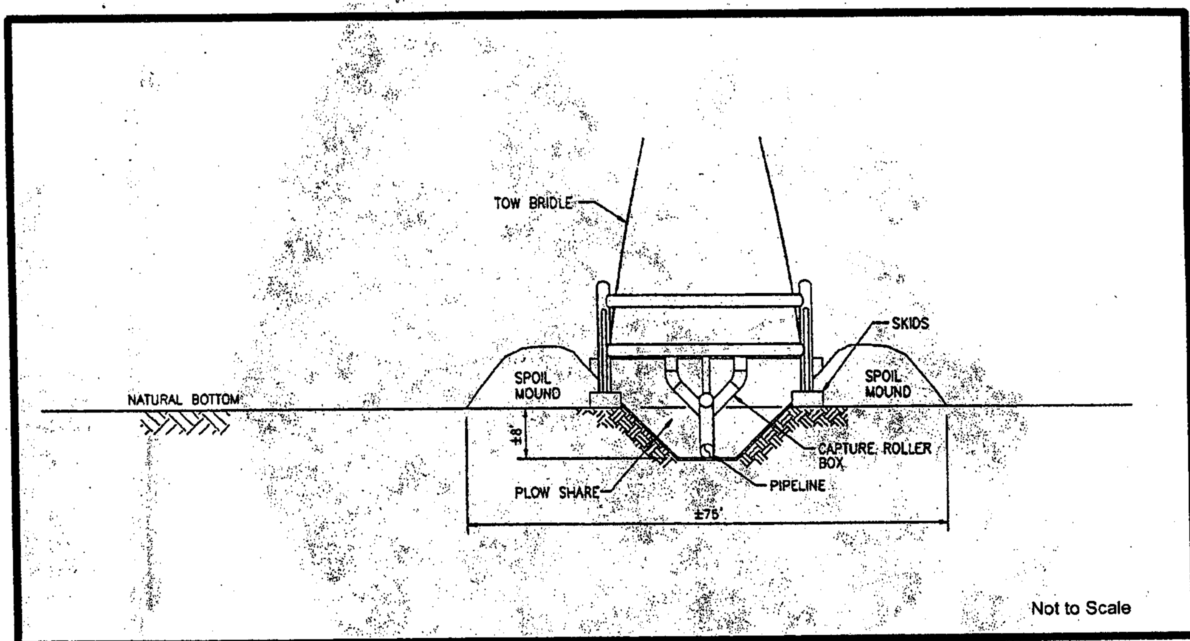


**Figure 2.3.3-3**
**Islander East Pipeline Project**
Typical Subsea Plow Trench Cross-Section

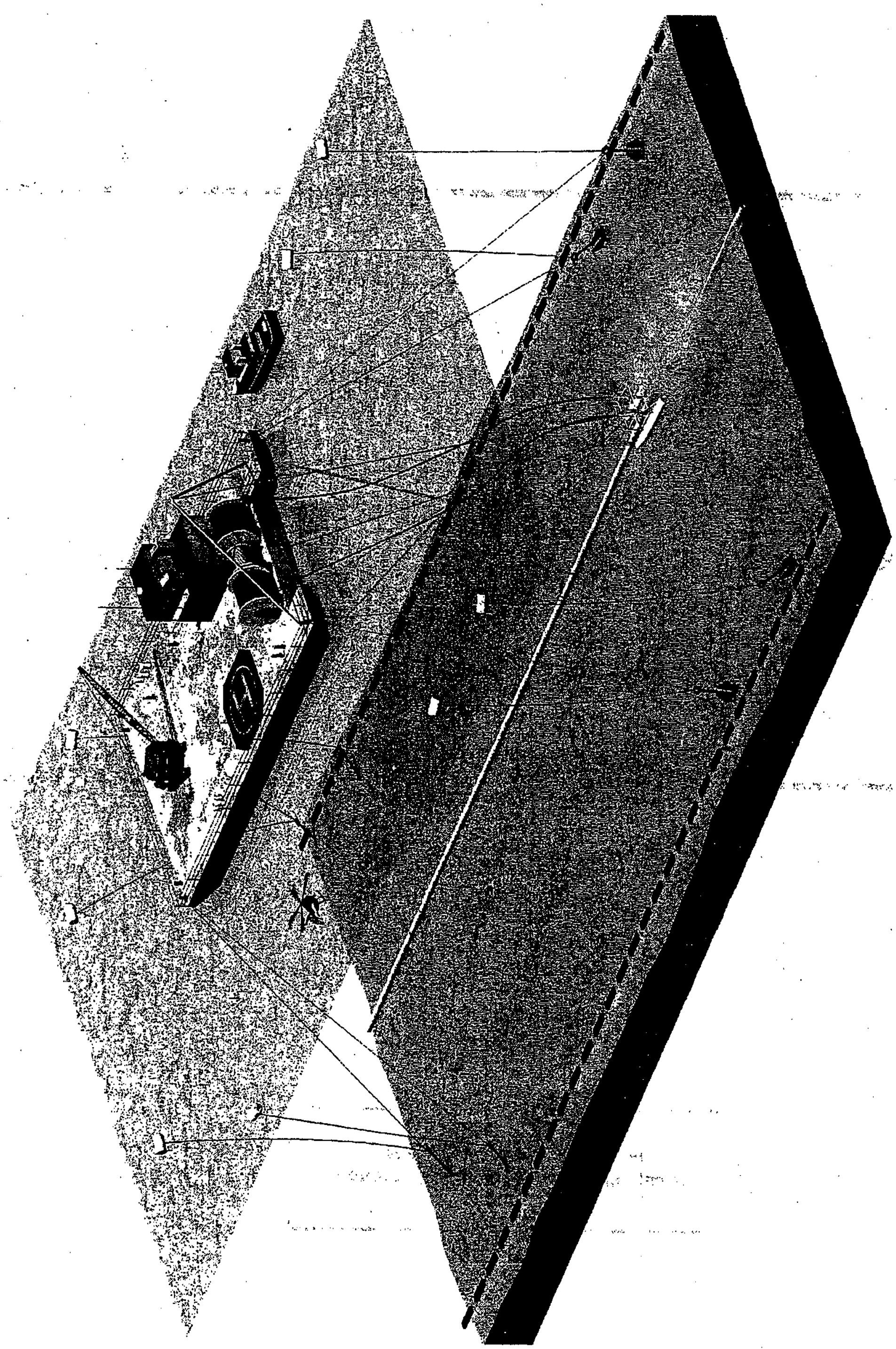



**Figure 2.3.3-4**
**Typical Offshore Pipeline Bury Barge (Jetting Sled)**

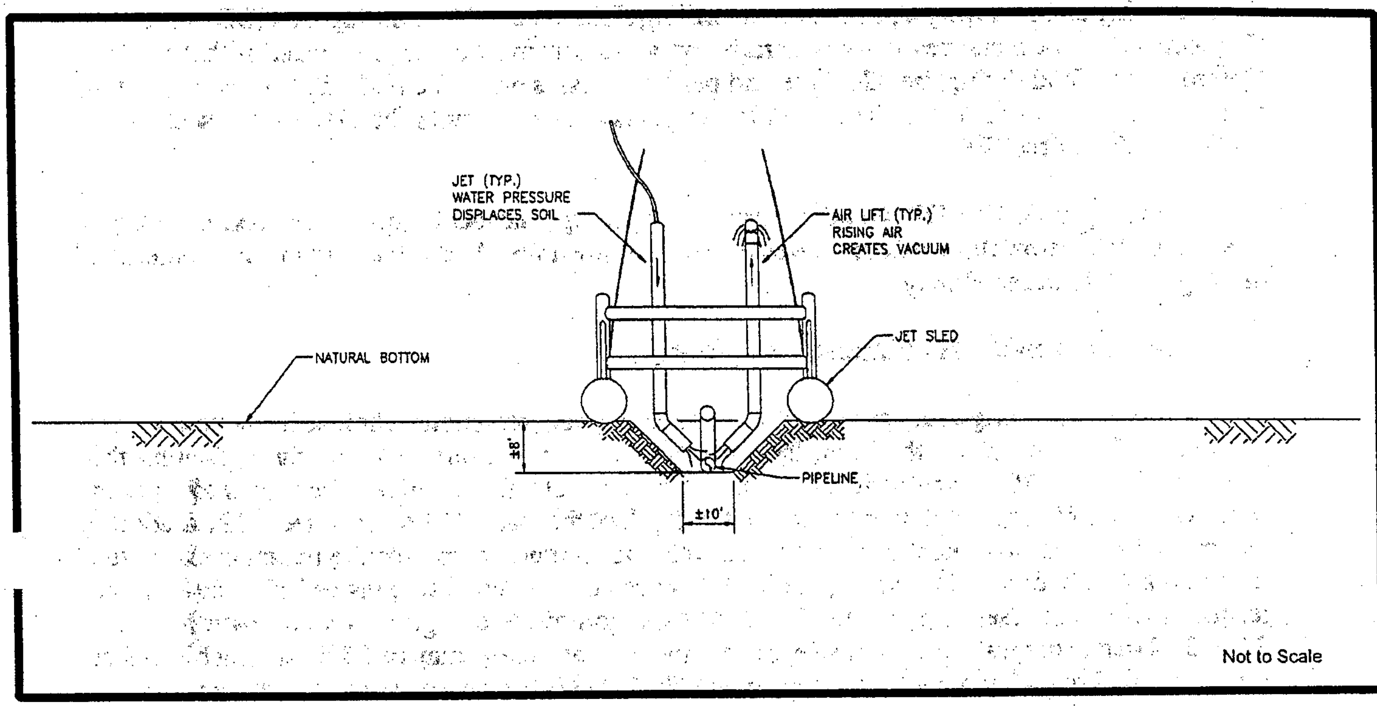


**Figure 2.3.3-5**
**Islander East Pipeline Project**
Typical Towed Jet Sled Trench Cross-Section

The HDD technique to be used at the Connecticut mainland approach would be similar to the HDD technique described in section 2.3.2.8. The process would involve drilling a hole from a point on the mainland (entry side) to a point on the sea floor (exit side) and installing a prefabricated segment of pipe through the hole (see figure 2.3.4-1). Islander East estimates that the borehole will be approximately 80 feet below the sea floor at the Tilcon Channel Crossing. The segment of pipe would be fabricated on a lay barge near the exit hole in Long Island Sound. After the hole is drilled, the pipeline segment would be attached to the drill string on the exit side of the hole and pulled back through the drill hole toward the drill rig. Islander East has developed several conceptual techniques for containing and capturing a postion of the drilling fluid to be utilized during the HDD process in Connecticut. These measures would generally apply to the reaming passes associated with the HDD. Control of the fluid during the pilot hole and pullback passes would be limited to collection of the fluid within the excavation at the exit hole. Impacts associated with the HDD are discussed in section 3.3.2.2 of the EIS.

As proposed, the HDD would primarily pass through the local bedrock at a maximum depth of about 80 feet below the sea floor. Based on surface indicators, the bedrock is hard and stable, and drilling would proceed slowly.

#### 2.3.4.2 Long Island Mainland Approach

Islander East originally proposed to use the dredge construction technique in shallow waters (less than 20 feet deep) on the Long Island mainland approach, and is currently evaluating the feasibility of the HDD technique in this area. In Connecticut, dredging would be used from the end of the directionally drilled segment to where the depth of the water is at least 20 feet. The dredging technique is similar to typical offshore construction technique except that the trench is excavated using a crane or hydraulic excavator positioned on a relatively small barge instead of using a subsea jetting sled or plow (see figure 2.3.4-2). A cross-section of the dredge trench is shown in figure 2.3.4-3. Dredge barges can vary in size, but a typical dredge barge may be 250 feet long by 75 feet wide. At the Long Island approach, approximately 1,000 feet from the sea to the shore would be trenched using this technique.

The dredge barge would be equipped with anchors or spuds (supporting legs). The crane or excavator on the barge would be used to dig the trench to the appropriate depth and to create a flotation channel for the barge if needed. Islander East estimates that the trench would be about 50 feet wide at the top. Trench spoil would be sidecast in an area about 60 feet wide on one side of the trench. Generally, flotation channels are needed in water less than 10 feet deep. Figure 2.3.4-4 shows a cross-section of a flotation trench. Flotation channels would be approximately 100 feet wide, and would also serve as the pipeline trench. Spoil would extend abvout 90 feet to one side of the trench and this material would be used to backfill the trench.

During dredging, pipe would be laid in shallow waters using a smaller lay barge equipped with anchors or spuds. Barge movement and anchor handling in shallow waters would be assisted by tug boats or smaller self-propelled barges designated specifically for the task. Once the pipe is installed and tested, the dredge barge would backfill the trench and flotation channels.

As an alternative to using a dredge barge for the Long Island, New York shore approach, Islander East is evaluating two crossing techniques. The first technique is a modified version of the open-cut approach where a series of sheet piles would be used to control shoreline soil movement during trench excavation, pipelay and trench backfilling. Sheet piling would be removed as back-filling proceeds. The second technique is a HDD similar to that described in section 2.3.4.1 for the Connecticut mainland approach.

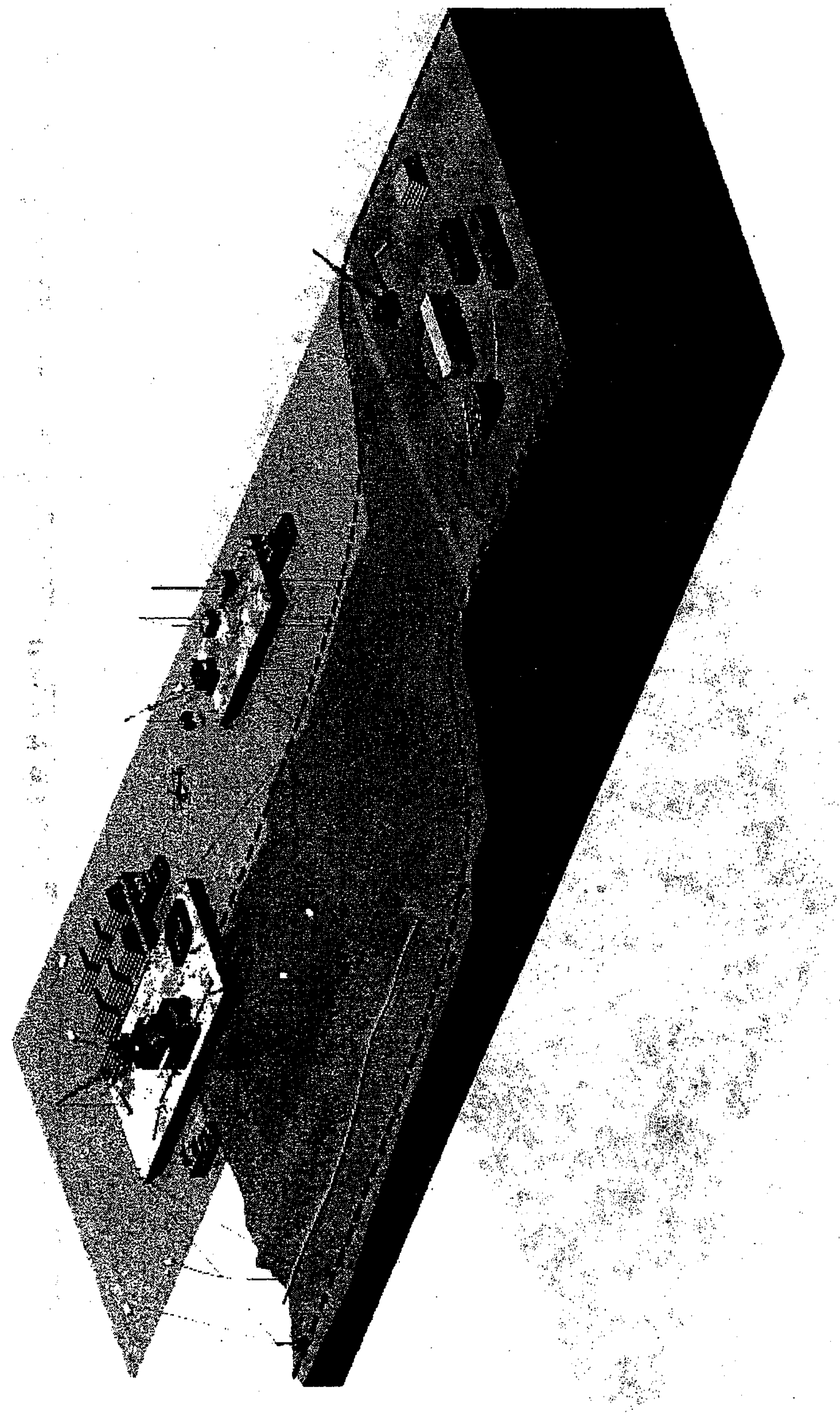



**Figure 2.3.4-1**
**Typical Onshore to Offshore Horizontal Directional Drill**

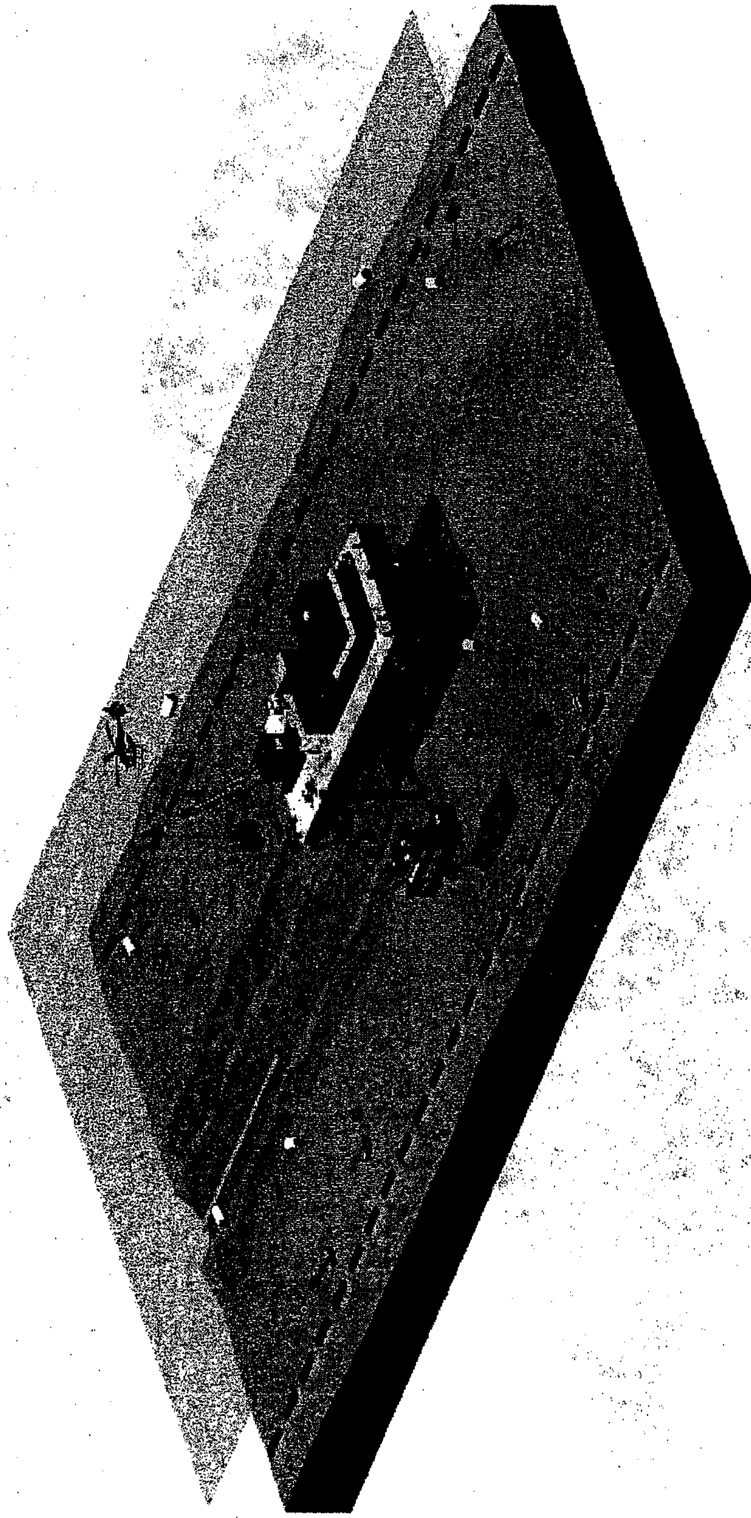



**Figure 2.3.4-2**
**Typical Offshore Dredge Barge**

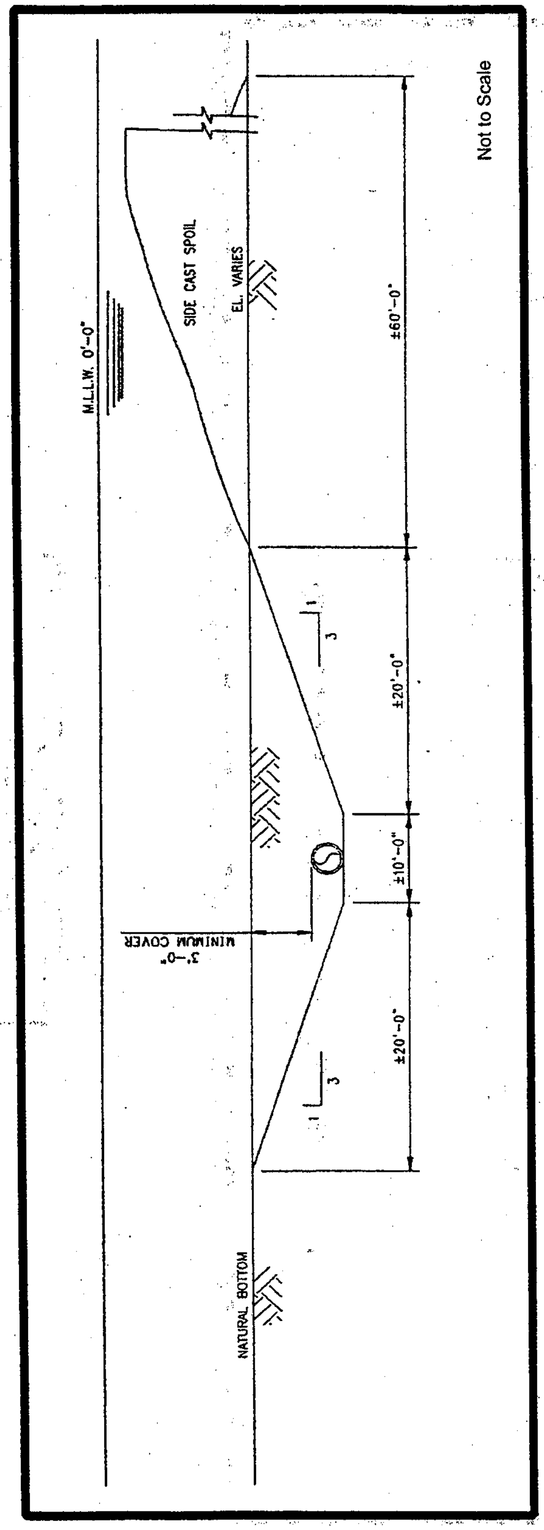


**Figure 2.3.4-3**
**Islander East Pipeline Project**
Typical Dredge Trench Cross-Section

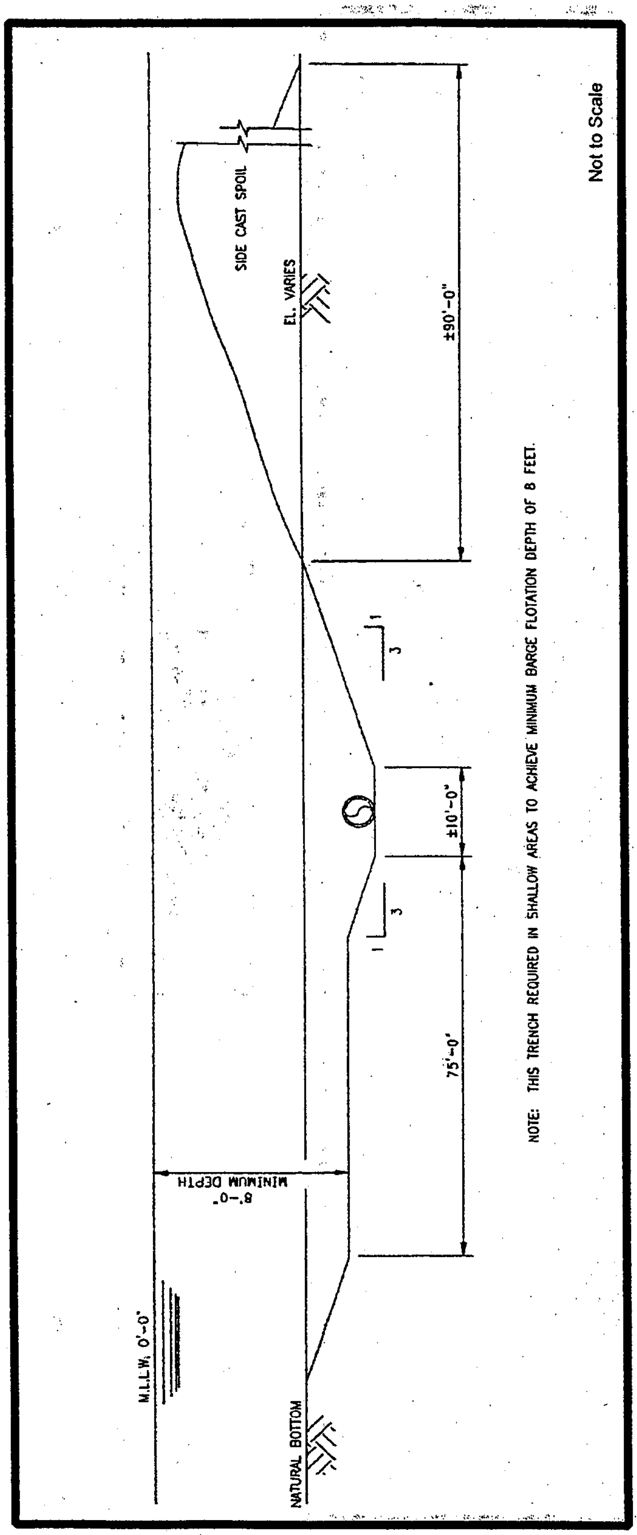


**Figure 2.3.4-4**
**Islander East Pipeline Project**
Typical Flotation Trench Cross-Section

#### 2.3.4.3 Blasting

Blasting may be necessary in the waters off Connecticut between MP 11.79 and 11.83. Blasting may be necessary where bedrock is encountered and the pipeline cannot be laid on the sea floor and armored with stone rip-rap or concrete mats. If blasting is necessary, a separate barge equipped with several drill rigs along one side would be used to drill holes into the bedrock for the placement of blasting charges. See sections 3.3.1.2, 3.3.3.2, and 3.4.1.2 of the EIS for additional details on offshore blasting and potential impacts and mitigation measures.

#### 2.3.4.4 Foreign Utility Lines

The offshore portion of the Islander East Pipeline would cross a Flag Atlantic I telecommunications cable at MP 25.9 and an MCI WorldCom telecommunication cable at MP 26.9. At these locations, the proposed pipeline would be laid on the sea floor over the foreign utility with a concrete separation barrier placed between the existing utility and proposed pipeline. The pipeline would then be covered with a protective layer of stone rip-rap or concrete mats. The trench approaching these areas would require hand jetting by divers.

### 2.3.5 Aboveground Facilities Construction Procedures

Construction of the compressor station, meter stations, mainline valves, and launchers and receivers would involve clearing; grading; placement of the foundations, piping, and structures; and restoration. The following sections summarize the construction procedures for the aboveground facilities.

#### 2.3.5.1 Compressor Station

The site for the Cheshire Compressor Station would be cleared of vegetation and graded as necessary to create a level surface for the movement of construction vehicles and to prepare the area for building foundations. After clearing is completed, silt fence and/or straw bales would be installed where necessary to minimize soil runoff and sedimentation, in accordance with erosion countermeasures stated in the ESC Plan.

The compressor station would include two buildings: a control/auxiliary building and a compressor building. The control/auxiliary building would include space for offices, a utility area, a control room for the compressor station, storage for supplies and materials, a washroom, a workshop, an emergency generator (Waukesha Model F18GL), and an air compressor. The compressor building would house a single 12,028 hp Solar Taurus 70 gas turbine compressor.

Building construction would commence after level foundations are prepared. The compressor building would be acoustically treated to absorb sound and to conserve energy. The site is located in a relatively remote area and is not visible from nearby roads. Therefore, minimal landscaping is proposed at the site.

Major gas pressure piping at the compressor station would involve welded construction, except where connected to flanged components. The piping work may begin in a fabrication shop offsite, or all fabrication may occur onsite if workspace permits. If offsite fabrication is employed, the prefabricated pieces would be shipped to the site and installed. Piping installed below grade would be coated for corrosion protection prior to backfilling, and a cathodic protection system would be installed to protect underground piping.

Prior to placing the compressor station in service, the gas piping system (both above and below ground) would be hydrostatically or pneumatically tested. All controls and safety devices such as the emergency shut-down system, relief valves, gas and fire detection facilities, overspeed, vibration, as well as other on- and off-engine protection and safety devices would be checked and tested. The compressor would be operated on a trial basis after completion of piping and mechanical work to verify the proper operation of safety and protective devices. The initial trial operation of the compressor would consist of several runs of short duration over a period of several days.

After the completion of startup and testing, or as soon as weather permits thereafter, the compressor station site would be final graded and seeded with appropriate grass species. Cleanup and restoration of various parts of the station yard would be completed as work on the area is finished. A permanent security fence would be installed around the site. The station access road and parking areas would be final graded and paved with either asphalt or gravel.

#### 2.3.5.2 Meter Stations

Many of the procedures used in meter station construction would be similar to those used in compressor station construction described above. Meter station construction would typically include clearing and grading, preparing foundations, installing electric and telephone service, installing underground piping, erecting meter buildings, installing piping inside the meter buildings, testing the piping, testing the control equipment, cleaning up the work area, paving access roads and parking areas, fencing the facilities, and final grading and landscaping.

#### 2.3.5.3 Mainline Valves

Five mainline valves would be located at intervals along the pipeline. A typical valve site would include a valve with a height of 6 to 8 feet above the ground surface, enclosed in a fenced area roughly centered on the pipeline. Where possible, valves would be located adjacent to public roads to provide year round access. Permanent access roads or approaches would be constructed to each site. Upon completion, the disturbed area would be stabilized with gravel within a fenced enclosure and by seeding with appropriate grass species outside the fence.

#### 2.3.5.4 Launcher Relocation

Two existing pig launchers would be removed from an existing mainline valve site and interconnect located near MP 0.6 in New Haven County, Connecticut and relocated to the Cheshire Compressor Station. Relocation of the launchers to this facility would allow inspection/cleaning of a greater portion of the C-1 and C-1 L Pipelines in the future and would consolidate more facilities at the compressor station site. The existing mainline valve and interconnect would continue to operate at the site.

### 2.3.6 Safety Controls

Islander East would prepare and follow a project-specific operation and maintenance plan. Typical safety measures include quality control and testing during construction, ensuring the structural integrity of the pipeline during operation, and preventing damage to the pipeline by third parties. Regular maintenance activities would include ensuring that the built-in safety controls such as valves, sensors, and the cathodic protection system are all functioning properly. In addition, internal inspection tools would be run through the pipeline to check for wear and irregularities in the pipe. These maintenance activities would be performed on both the onshore and offshore segments of the pipeline.

### 2.3.6.1 Pipeline Construction and Design

The proposed facilities would be designed and constructed to meet or exceed the safety standards established by the DOT in 49 CFR Part 192. The project would be built in accordance with regulations that govern material selection and qualification, minimum design requirements, location adjacent to roads and railroads, and protection from internal, external, and atmospheric corrosion. External corrosion protection would be achieved by means of externally coated pipe and cathodic protection using rectifiers and anodes as required by 49 CFR Part 192. Cathodic protection systems would be installed at various points along the pipelines to mitigate corrosion of the pipeline facilities. The cathodic protection systems would impress a low-voltage current to the pipeline to off-set natural soil and groundwater corrosion potential.

Where the pipeline is installed in Long Island Sound, it would generally be concrete coated and buried a minimum of 3 feet below the sea floor in no more than 12 feet of water. In areas over 12 feet, the pipeline would be concrete-coated and buried to at least one-half its diameter, or deeper as determined after consultations with state permitting agencies.

Pipeline markers alerting boats to the presence of the pipeline and prohibiting anchoring would be installed at the Long Island Sound landfall. The pipeline would also be noted on future navigational charts as a designated pipeway, further minimizing potential for anchor strikes on the pipeline.

The submerged pipeline would be protected against corrosion and with an external protective coating that meets the requirements of 49 CFR Part 192.461. In addition, it would have a cathodic protection system designed to protect the pipeline in accordance with 49 CFR Part 192 Subpart I. This protection system would be installed and placed in operation within 1 year after construction of the pipeline is completed.

### 2.3.6.2 Compressor Station Design and Construction

The Cheshire Compressor Station would be designed and constructed to meet or exceed 49 CFR Part 192 requirements. The compressor station would be equipped with automatic detection and emergency shut-down systems. These systems would include:

- A flame detection system that uses ultraviolet sensors;
- A gas detection system for detecting explosive concentrations of natural gas;
- A heat detection system that uses infrared sensors;
- An emergency shut-down system to isolate and blowdown the gas piping, and provide a means to shut-down equipment and electrical circuits to eliminate sources of spark ignition; and
- Individual unit shut-down systems in case of mechanical or electrical failure of a compressor unit system or component.

Compressor station piping would be protected from over-pressurization by means of relief valves and venting systems for safe blowdown of gas. Fire fighting equipment at the compressor station site would consist of hand-held or wheeled dry chemical fire extinguishers in accordance with National Fire Prevention Association Code 17, Volume 1 (1998).

### 2.3.6.3 Pipeline Equipment and Control

The proposed Algonquin and Islander East transmission systems include equipment features that are designed to increase the overall safety of the system and protect the public from a potential failure due to accidents or natural catastrophes.

Algonquin and Islander East would maintain a gas control center in Houston, Texas. The Houston Gas Control Center would monitor system pressures, flows, and customer deliveries. Further, the gas control center would be manned 24 hours a day, 365 days a year. Algonquin and Islander East would also operate area and sub-area offices along the pipeline route whose personnel would provide the appropriate response to emergency situations and direct safety operations as necessary.

The proposed facilities would be equipped with remote control valves. This would allow the valves to be operated remotely by the Houston Gas Control Center in the event of an emergency, usually evidenced by a sudden loss of pressure in the pipelines. Remotely closing the valves would allow sections of pipeline to be isolated from the rest of the pipeline system quickly.

Data acquisition systems would be present at all meter stations along the system. If system pressures fall outside of a predetermined range, an alarm would be activated and notice would be transmitted to the Houston Gas Control Center. The alarm would provide notice that the pressure at a meter station is not within an acceptable range.

### 2.3.6.4 Operation and Maintenance

Algonquin and Islander East would operate and maintain the proposed facilities in a manner that meets or exceeds the requirements of 49 CFR Part 192. Algonquin and Islander East would prepare and implement an Operation and Maintenance Plan that would include the following activities, which meet or exceed the minimum DOT requirements:

- Air patrols, at least weekly, of the pipeline right-of-way would check its condition and look for indications of leaks or third-party activity;
- On-the-ground leak surveys with leak detector equipment would be conducted on a regular basis;
- In-line tool inspections, as required, would check the internal condition of the pipelines;
- Inspections of the cathodic protection systems would ensure proper operating conditions for corrosion mitigation;
- Routine contacts with property owners, utilities, local government agencies, contractors, and other interested parties would be used to inform them of the

pipeline location, and procedures to be followed in reporting and responding to a pipeline emergency;

- Participate in a qualified one-call system in each state, including staking and marking the location of the pipeline for third-party construction and landowner requests;
- Internal audits of field locations would be used to ensure compliance with existing operating and maintenance standards and safe-work procedures;
- Periodic pipe-to-soil potential surveys would be used to maintain the cathodic protection of the pipeline;
- Annual in-house training program for operation and maintenance personnel would be used to maintain skill levels and review safety procedures in case of a pipeline emergency; and
- Annual testing of relief valves and emergency shut-down systems at compressor stations would check their reliability.

#### 2.3.6.5 Emergency Plan

Algonquin and Islander East would prepare and implement an Emergency Response Plan. In case of an emergency, Algonquin's and Islander East's operating personnel would implement the appropriate emergency plan depending upon the facilities involved (i.e., compressor station or pipeline). The emergency plan would include the following information:

- The local field headquarters to contact;
- A listing of company personnel, local police, and fire authorities to contact;
- A listing of equipment available at field locations;
- A description of the roles of Field Supervisors, Gas Control Operators, Field Crews, and support personnel during an emergency;
- A description of the procedure to maintain communication between Gas Control Operators and local fire, police, and government authorities;
- A description of procedures for securing additional help from non-company resources if needed; and
- Requirements for logging emergency events and reporting to company and regulatory authorities.

#### 2.3.6.6 Liaison Procedures with Local Authorities

Algonquin's existing liaison program with public authorities and local utilities would be expanded by Islander East to include all of the locations affected by the proposed facilities. Key components of the expanded liaison program would include:

- Periodic fire fighting demonstrations in each district;

- Periodic visits with municipal safety officials to inform them of the nature and pressure of Algonquin and Islander East facilities and to coordinate emergency response in the event of an accident;

- Special informational meetings and training at the initiation of the municipality; and

- Periodic literature distribution listing emergency telephone numbers and other pertinent data.

Algonquin and Islander East would maintain contact with the police and fire departments and/or public officials of all communities that contain Algonquin or Islander East facilities in order to:

- Ascertain how the officials may be able to assist Algonquin or Islander East during an emergency, including the determination of the jurisdiction and/or responsibility with resources that may be involved in a response to an emergency;

- Acquaint the officials with how Algonquin or Islander East would respond to an emergency on their pipeline systems;

- Notify the officials of the types of pipeline emergencies for which they would be contacted; and

- Inform officials how Algonquin or Islander East, in working with their departments, would cooperate in mutually assisting in protecting life or property during an emergency.

Police and fire departments and public officials would be given maps that show the location of Algonquin's or Islander East's facilities within their towns. In order to enable Algonquin and Islander East to quickly establish contact with police or fire departments and public officials in the event of an emergency at any location on the pipeline system, a current listing of telephone numbers would be maintained. This listing would be reviewed and revised on a periodic basis as necessary.

Algonquin and Islander East would also invite fire companies to participate in their periodic fire demonstrations. The demonstrations would discuss when and when not to extinguish a natural gas fire during an emergency, and how to extinguish different types of natural gas fires.

## 2.4 OPERATION AND MAINTENANCE PROCEDURES

### 2.4.1 Pipeline Facilities

Algonquin and Islander East would periodically perform operation and maintenance on their pipeline systems and rights-of-way. These activities may include routine vegetation clearing, pipeline integrity surveys, erosion repair and control, and pipe coating inspections.

#### 2.4.1.1 Routine Vegetation Clearing

In order to maintain accessibility of the right-of-way and to accommodate pipeline integrity surveys, vegetation along the pipeline right-of-way would be periodically mowed. In uplands, a

10-foot-wide corridor centered over each pipeline would be mowed annually. In addition, vegetation would be mowed over the entire 50-foot-wide permanent right-of-way once every 3 years. In wetlands and riparian areas, a 10-foot-wide corridor centered over each pipeline may be maintained in a herbaceous state. In addition, trees within 15 feet of the pipelines that are greater than 15 feet in height may be selectively cut and removed from the right-of-way every 3 years. Routine clearing activities would not be conducted between April 15 and August 1 to avoid potential interference with wildlife nesting activities. No herbicides would be used to maintain the right-of-way. Algonquin and Islander East would only use mechanical mowing or cutting along their rights-of-way for normal vegetative maintenance. However, in those areas where the Algonquin and Islander East pipeline parallels or is within adjacent rights-of-way, alternate means of vegetative maintenance may be used by the owner(s) of those areas. Landowners may also maintain their land, e.g., homeowners may frequently cut the grass near their homes.

#### 2.4.1.2 Pipeline Integrity Surveys

Routine pipeline integrity surveys would be conducted on the pipeline systems in compliance with DOT requirements. These surveys would include system walkovers on the ground, aerial inspections from a fixed-wing aircraft, and periodic internal pipeline inspections.

#### 2.4.1.3 Erosion Repair and Control

Typically, permanent soil erosion control measures are installed during the restoration phase of a construction project. However, after restoration is complete, permanent erosion control devices may need to be repaired or additional erosion control devices may be needed. Erosion-prone areas, such as stream crossings, are inspected during pipeline integrity surveys to verify the performance of the erosion control measures and structures. If erosion is evident, the right-of-way is restored and erosion control devices are installed as necessary to prevent future degradation.

#### 2.4.1.4 Pipe Coating Inspections

In some cases, pipe integrity surveys and inspections may identify areas where the pipe coating needs to be visually inspected. Pipe coating inspections involve excavating the pipeline, inspecting the coating, and repairing the coating as needed. After the inspection is completed and repairs are made, the site is restored and reseeded. Temporary and permanent soil erosion and sediment control devices are installed where necessary to minimize the potential for soil erosion and runoff.

### 2.4.2 Aboveground Facilities

Prior to placing compressor and meter stations in service, Algonquin and Islander East would develop plans to govern the operation and maintenance of these facilities. The plans would address maintenance of equipment, compliance with permit requirements, handling of hazardous materials, disposal of waste, and contingency measures to be followed in the event of an emergency.

The proposed compressor station would be operated and maintained in accordance with DOT requirements and standard industry procedures designed to ensure the integrity and safe operation of the pipeline system and to maintain firm natural gas transportation service. In addition to onsite operation and maintenance activities, the compressor station would use a Supervisory Control and Data Acquisition system, including a satellite or other communication system, which would provide monitoring of the pipeline system on a 24-hour basis from a central monitoring location.

The compressor station would be designed for remote control operation, with two personnel assigned to the station on a full-time basis for maintenance purposes. Standard maintenance procedures would include activities such as the calibration, inspection, upkeep, and repair of equipment; and the monitoring of pressure, temperature, and vibration data at the station. Contingency procedures would be developed for use in the event of emergency situations (see section 2.3.6). The procedures would specify notification requirements and would conform to the applicable DOT requirements.

The meter stations would be designed for remote control operation, and would operate 24 hours per day, year round. Maintenance personnel generally would visit each meter station once a week. The meter stations would be monitored on a 24-hour basis through a dedicated communications network that includes site security. The operation of the meter stations would be coordinated with the pipeline company or entity that receives the gas.

Vegetation would be maintained within the fenceline of aboveground facilities. Vegetation growing up through the gravel within the fenced sites may be controlled by application of herbicides in compliance with applicable laws and regulations.

## 2.5 FUTURE PLANS AND ABANDONMENT

Islander East does not have future plans to expand or abandon any of the proposed facilities. If demand for natural gas necessitates expanding the facilities in the future, the expansion would be subject to approval by the FERC. If for some reason Islander East is required to abandon any of the facilities in the future, the abandonment would also be subject to approval by the FERC.

## 2.6 PERMITS AND APPROVALS

Table 2.6-1 lists some of the environmental permits and approvals that Algonquin and Islander East intend to apply for.

As the lead Federal agency for the Islander East Pipeline Project, the Commission is required to comply with Section 7 of the Endangered Species Act (ESA), the Magnuson-Stevens Fishery Conservation and Management Act, Section 106 of the National Historic Preservation Act (NHPA), and the Coastal Zone Management Act. At the Federal level, required permits and approval authority outside of FERC's jurisdiction include compliance with the Clean Water Act (CWA), the Rivers and Harbors Act of 1899, and the Clean Air Act (CAA). Each of these statues has been taken into account in the preparation of this document.

Federal, state, or local regulatory agencies have permit or approval authority, or consultation requirements for portions of the proposed project (see table 2.6-1). The Commission states in its orders that applicants should cooperate with state and local agencies. However, any state or local permits issued with respect to jurisdictional facilities must be consistent with the conditions of any Certificate the Commission may issue. Although the Commission encourages cooperation between interstate pipelines and local authorities, this does not mean that state and local authorities, through application of state and local laws, may prohibit or unreasonably delay the construction or operation of facilities approved by the Commission.

TABLE 2.6-1
**Permits, Approvals, and Consultations**

| Agency | Permit/Approval/Consultation |
|---|---|
| **FEDERAL** | |
| **Advisory Council on Historic Preservation** | |
| | • Review under Section 106 of the National Historic Preservation Act, if appropriate |
| **Department of the Army, Corps of Engineers** | |
| | • Permit under Section 10 of the Rivers and Harbors Act |
| | • Permit under Section 404 of the Clean Water Act |
| **Department of Commerce, Coast Guard** | |
| | • Review of Section 10 of the Rivers and Harbors Act |
| **Department of Commerce, National Marine Fisheries Service** | |
| | • Review under Section 7 of the Endangered Species Act |
| | • Review under the Marine Mammals Protection Act |
| | • Review under the Magnuson-Stevens Fishery Conservation and Management Act |
| **Department of the Interior, Fish and Wildlife Service** | |
| | • Review under Section 7 of the Endangered Species Act |
| **Federal Energy Regulatory Commission** | |
| | • Certificate of Public Convenience and Necessity under Section 7(c) of the NGA |
| **Environmental Protection Agency** | |
| | • Water Quality Certification under Section 401 of the Clean Water Act |
| | • Permits under Section 402 of the Clean Water Act |
| | • Review of Section 404 application |
| **STATE - CONNECTICUT** | |
| **Department of Environmental Protection** | |
| | • Review of State Protected Species |
| | • Permit to Construct and Operate an Air Emission Source |
| | • Review and Approval of Noise Analysis |
| | • Permit for Stormwater and Dewatering Discharges |
| | • Permit for Hydrostatic Test Water Discharges |
| | • Coastal Zone Consistency Determination |
| | • Permit for Inland Wetland and Watercourse Crossings |
| | • Permit for Stream Channel Encroachment |
| | • Permit for Structures, Dredging and Fill |
| | • Permit for Water Diversion |
| | • Permit for Water Quality Certificate under Section 401 of the Water Quality Act |
| **State Historic Preservation Officer** | |
| | • Review under Section 106 of the National Historic Preservation Act |
| **Siting Council** | |
| | • Certificate of Environmental Compatibility and Public Need |
| | • Development and Management Plan Approval |
| **STATE - NEW YORK** | |
| **Department of Environmental Conservation** | |
| | • Review of State Protected Species |
| | • Permit for Freshwater Wetland Crossings under Article 24 of Environmental Conservation Law |
| | • Permit for Tidal Wetland Crossings under Article 25 of Environmental Conservation Law |
| | • Permit for Protected Water Crossings under Wild, Scenic, and Recreational River Systems (Article 15, Title 27, ECL) |
| | • Permit under the State Pollutant Discharge Elimination System |
| | • Permit for Water Quality Certificate under Section 401 of the Water Quality Act |
| | • Permit for Coastal Erosion Hazard Areas (Article 34, ECL) |
| | • Permit to construct/certificate to operate air contamination source |
| **State Historic Preservation Officer** | |
| | • Review under Section 106 of the National Historic Preservation Act |
| **Department of State** | |
| | • Coastal Zone Consistency Determination |
| **Office of General Services** | |
| | • Permit to Cross Land Beneath Coastal Waters and Waters of Large Lakes and Rivers |

## 2.7 NONJURISDICTIONAL FACILITIES

The Islander East Pipeline would serve two planned power plants and one local natural gas distribution company that do not come under the jurisdiction of the FERC. The power plants include the Brookhaven Energy Project and the AES Calverton Facility. The local distribution company is KeySpan Energy Delivery Long Island. Potential cumulative impacts of these facilities are discussed in section 3.13, Cumulative Impacts.

### 2.7.1 Brookhaven Energy Project

The Brookhaven Energy Project is a natural gas-fired, combined cycle powerplant capable of producing up to 580 megawatts of electricity to be developed in an industrially-zoned area in Brookhaven, New York. The power plant would employ Alstom Power GT-24 turbines in a two-by-two configuration.

Brookhaven Energy Limited Partnership is the project sponsor and an affiliate of American National Power, Inc. American National Power, Inc., is a subsidiary of International Power plc. International Power plc. is one of the world's largest independent electric generating companies with 6,400 megawatts (net) in operation, 4,500 megawatts (net) under construction, and approximately 8,000 megawatts (net) in advanced development.

New York's Article X process regulates the siting of electric generating facilities. This process designates the State Board on Electric Generation Siting and the Environment to review and rule on applications pertaining to power plant siting. The project site is at the southeast corner of the Long Island Expressway (at Exit 66) and Sills Road (see figure 2.7.1-1). The site consists of 28 acres in an industrially zoned area near the North Bellport Economic Development Zone. This site was chosen because it is zoned industrial; the area is surrounded by commercial and industrial properties; electric transmission lines are adjacent to the property; a KeySpan Energy Delivery natural gas pipeline runs along the Long Island Expressway immediately north of the site; water and sewer infrastructure is located within the immediate vicinity; the site is already bounded on all sides by infrastructure corridors such as highways, a railroad line, and transmission lines; and the site is relatively remote from residential development.

The Brookhaven Energy Project would burn only natural gas to reduce emissions and increase plant efficiency. The plant would use cutting edge air pollution control equipment, resulting in an extremely low emissions rate and would use air-cooling technology resulting in minimal water use. The plant would operate at approximately 58 percent efficiency, compared to approximately 35 percent efficiency for typical power plants.

The plant would be designed to meet the Federal CAA Lowest Achievable Emission Rate and the Best Available Control Technology (BACT) Standards. The facility would be a relatively quiet electricity generation station and would meet all Federal, state, and local noise regulations. Plant structures would be painted in neutral earth-tone colors that would minimize visual impacts. The stack height would be limited to a maximum of 160 feet.

The plant would use an air-cooled condenser to achieve an approximate 99 percent reduction in water use compared to the amount of water needed for power plants using water-cooling. During normal operation, the plant would use only about 29,000 gallons of water per day. Using this modern air-cooling technology, the amount of water used and wastewater created would be minimal. Water would be supplied by the Suffolk County Water Authority, and sewer service would be provided by the Suffolk Department of Public Works.

Brookhaven Energy Limited Partnership filed a "Preliminary Scoping Statement" with New York's State Board on Electric Generation Siting and the Environment on March 24, 2000. Then, on December 5, 2000, Brookhaven Energy Limited Partnership filed stipulations between Brookhaven Energy Limited Partnership and staff of the New York State Department of Public Service, New York State Department of Conservation, and New York State Department of Health. These stipulations are a result of an 8-month process in which regulatory agencies and members of the public commented on the scope of studies for this project's application before the New York State Board on Electric Generation Siting and the Environment. The state has one year to review and rule on the application. On December 5, 2000, Brookhaven Energy Limited Partnership also filed a Prevention of Significant Deterioration (PSD) Air Permit Application, and a Permit Application to Construct and Certificate to Operate a Major Stationary Source under 6 NYCRR 201. Project construction is expected to begin in early 2002 and is anticipated to take approximately 2 years to complete.

### 2.7.2 AES Long Island Project

The AES Long Island Project is a planned, 500 megawatt combined-cycle power plant to help meet Long Island's power needs. The plant would be developed on a 50 acre parcel within a 500 acre industrial development, known as the Calverton Enterprise Park, at the former 3,000 acre Calverton Naval Reserve Facility (see figure 2.7.2-1). The Calverton Enterprise Park is designated as an economic development zone by the State of New York.

AES Corporation (AES) is the project sponsor. AES is a power generating company that owns and operates 160 power plants and employs 56,000 people world-wide. AES owns and operates four power plants in the State of New York. In addition to generating power, AES also owns and operates electric distribution companies, and is involved in retail power marketing and telecommunications.

As with the Brookhaven Energy Project, New York's Article X process regulates the siting of this facility. The power plant would be located near the center of the reserve facility between two runways and just to the west of the existing steam plant and former hangers that are being converted for a variety of industrial and commercial uses. This site was selected because it is designated as an economic development zone by the state of New York and is surrounded by other industrial and commercial facilities. The site is well-buffered from the residences in the nearby Town of Riverhead by wooded and agricultural areas; the nearest residential community is over 1.2 miles away.

The AES power plant is a combined-cycle plant in which both a gas-turbine and a steam turbine are used in an integrated thermal cycle, resulting in an efficient system. The primary fuel would be natural gas, and would be much cleaner than the existing oil and gas generating units on Long Island. The advanced gas turbine technology to be used in the power plant would reduce emissions of key air quality substances by a factor of 1 to 10 as compared to the existing older power plants on Long Island.

The plant would be air cooled. Air-cooled systems are more expensive than the more commonly used water-based evaporative cooling systems, but their water requirements are significantly less and the amount of wastewater created would be minimal. Water and sewer would be supplied by the Town of Riverhead. Only sanitary waste water would be discharged to the town's waste treatment system. The waste water from the plant itself would be treated onsite and any residual waste products would be disposed of offsite.

Numerous meetings have been held with the Town of Riverhead regarding the site over the past year and a half. AES has met with the New York State Public Service Commission in an initial meeting, but no agency filings have been made to date.

### 2.7.3 KeySpan Energy Delivery Long Island

KeySpan Energy Delivery Long Island is a regulated utility that sells and delivers natural gas to home and business customers in the Long Island counties of Nassau and Suffolk and the Rockaway Peninsula of Queens County. KeySpan Energy Delivery Long Island also provides metering, billing and other services to its customers. KeySpan Energy Delivery Long Island is one of several KeySpan Energy Corporation companies. KeySpan Energy Corporation is the largest natural gas utility in the northeast, and the fourth largest in the country. KeySpan Energy Corporation delivers natural gas to nearly 2.5 million customers in New York, Massachusetts, and New Hampshire.

KeySpan Energy Delivery Long Island would obtain gas from Islander East at the Brookhaven Meter Station (see figure 2.7.3-1). The meter station site is located on a property that is large enough to accommodate KeySpan Energy Delivery Long Island's facilities within its boundaries. An existing KeySpan Energy Delivery Long Island pipeline is located approximately 400 feet north of the meter station and is parallel to the Long Island Expressway (Interstate 495). KeySpan Energy Delivery Long Island would be responsible for constructing its interconnect facilities and piping to connect its existing pipeline.