2.0 PROPOSED ACTION

2.1 PROPOSED FACILITIES

SESH proposes to construct, own, operate, and maintain a new, approximately 269-mile-long, interstate natural gas pipeline, which includes approximately 104 miles of 42-inch-diameter pipeline and 165 miles of 36-inch-diameter pipeline, approximately 1.7 miles of various laterals (6-, 16-, 20-, 24- and 42-inch-diameter), and associated ancillary facilities. The proposed Project pipeline would extend from receipt points with four existing intrastate pipelines (see Section 1.0) near Delhi in Richland Parish, Louisiana, to a terminus at the Rock Road Meter Site near Coden in Mobile County, Alabama. Gulfstream, SONAT, Mobile Gas Services, and FGT operate the interstate pipelines that would receive natural gas transported by the proposed Project. In addition, the Project would act as a virtual header system capable of receiving and delivering natural gas to the customers of Columbia Gulf, CEGT, Gulf South, TETLP, SONAT, Transco, Tennessee Gas, FGT, Mobile Gas Services, and Gulfstream.

The general location of the proposed Project facilities is shown in Figure 2.1-1 and more detailed facility location maps are provided in Appendix B. Throughout the sections of this document, the locations of specific features along the proposed pipeline, such as proposed Project facilities and environmental resources, are identified by milepost (MP). Table 2.1-1 provides the location, MP, and length information for the pipeline facilities associated with the proposed Project.

In addition to the proposed pipeline, SESH would also construct and operate 3 new compressor stations, 2 booster stations, 13 M&R stations, 18 mainline valves, and 3 pig[2] launcher/receiver facilities. Table 2.1-2 identifies and describes the aboveground facilities associated with the proposed Project and provides location and MP information for these facilities.

Natural gas is transported through a pipeline under pressure. The majority of the pipeline is designed for a maximum allowable operating pressure (MAOP) of 1,200 pounds per square inch gauge (Psig). Exceptions include the first 30 miles after leaving the Delhi Compressor Station, which is designed for an MAOP of 1,300 Psig, and the first 23 miles leaving the Gwinville Compressor Station, which is designed for an MAOP of 1,250 Psig.

As natural gas flows through a pipeline, friction causes a reduction in pressure. Compressor stations are used to increase the pressure and keep the flow of natural gas moving through the pipeline at an appropriate rate. As described in Section 2.2.2, four turbine compressor units at three compressor stations and two booster units would be installed along the system. During operation, the proposed Project would receive, transport, and deliver up to 1.14 Bcfd of natural gas.

The compressor units and associated equipment at each compressor station would be housed in buildings constructed on a slab foundation. Each compressor station would also include a natural gas-fired generator to provide backup electrical power at the facility. SESH would also construct an office building at each compressor station site. Additional aboveground facilities would include a pig launcher/receiver, mainline valve sites, control enclosures, and blowdown stacks. Most natural gas piping at the facilities would be installed below grade, and the perimeter of the compressor stations would be fenced. Portions of these sites may be paved, covered with gravel, or landscaped, depending on facility operations and maintenance requirements.

2 A pig is a mechanical tool used to clean and inspect the interior of a pipeline.

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General Location Map

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TABLE 2.1-1 Pipeline Facilities for the Proposed SESH Project			
	Milepost		
County/Parish	**Begin**	**End**	**Length (miles)**
Louisiana			
Richland Parish	0	0.35	0.35
Madison Parish	0.35	35.86	35.51
Mississippi			
Warren County	35.86	44.63	8.77
Claiborne County	44.63	59.99	15.36
Copiah County	59.99	100.85	40.86
Lawrence County	100.85	111.44	10.59
Jefferson Davis County	111.44	126.45	15.01
Covington County	126.45	151.85	25.4
Jones County	151.85	157.24	5.39
Forrest County	157.24	168.94	11.7
Perry County	168.94	192.16	23.22
Greene County	192.16	210.58	18.42
George County	210.58	236.41	25.83
Jackson County	236.41	239.65	3.24
Alabama			
Mobile County	239.65	269.31	29.66
Total			**269.31**

TABLE 2.1-2 Aboveground Facilities for the Proposed SESH Project				
Facility	**Facility Type**	**MP**	**State**	**County/ Parish**
M&R Station Header/Lateral	750 feet of 42–inch-diameter pipeline	-0.03-0.00	LA	Richland
CEGT CP Project M&R Station	M&R runs, assoc. piping	-0.03	LA	Richland
Gulf South Mississippi Expansion M&R Station	M&R runs, assoc. piping	-0.03	LA	Richland
Columbia Gulf M&R Station	M&R runs, assoc. piping	-0.01	LA	Richland
CEGT 24-inch M&R Station	M&R runs, assoc. piping	0.10	LA	Richland
Delhi Compressor Station, Pig launcher, and mainline Valve	25,782 hp compressor station, 48-inch launcher, 42-inch launcher valve	0.22	LA	Richland
Mainline valve	42-inch valve operator, 12-inch blowoffs	17.82	LA	Madison
Mainline valve	42-inch valve operator, 12–inch blowoffs & reg. runs	29.31	LA	Madison
Mainline valve	42-inch valve operator, 12–inch blowoffs	39.72	LA	Warren
Mainline valve	42-inch valve operator, 12-inch blowoffs	55.79	MS	Claiborne
TETLP M&R Station	M&R runs, assoc. piping	72.39	MS	Copiah
Mainline valve	42-inch valve operator, 12–inch blowoffs	73.69	MS	Copiah
Mainline valve	42-inch valve operator, 12-inch blowoffs	84.21	MS	Copiah
Mainline valve	42-inch valve operator, 12-inch blowoffs	100.77	MS	Lawrence
Pig receiver and launcher	48-inch receiver, 42-inch receiver valve, 42-inch launcher, 36-inch launcher, & bypass valves	104.08	MS	Lawrence
Gwinville Compressor Station, SONAT M&R Station, and SONAT lateral	12,712-hp compressor station, M&R runs, assoc. piping, 610 ft of 24–inch-diameter pipeline to SONAT	115.70	MS	Jefferson Davis
Mainline valve	36-inch valve operator, 12-inch blowoffs	125.64	MS	Jefferson Davis

TABLE 2.1-2
Aboveground Facilities for the Proposed SESH Project

Facility	Facility Type	MP	State	County/ Parish
Collins Booster Station, Transco M&R Station, Transco Williams lateral, and mainline valve	7,100-hp compressor station, M&R runs and assoc. piping, and 36-inch valve operator, 12-inch blowoffs & reg., 310 ft of 20–inch-diameter pipeline to Transco Williams	138.22	MS	Covington
Mainline valve	36-inch valve operator, 12-inch blowoffs	153.00	MS	Jones
Mainline valve	36-inch valve operator, 12-inch blowoffs	161.97	MS	Forrest
Petal Booster Station, Tennessee Gas M&R Station, and Tennessee Gas lateral	3,550-hp compressor station and M&R runs, assoc. piping, 420 ft of 20–inch-diameter pipeline to Tennessee Gas	166.54	MS	Forrest
Mainline valve	36–inch valve operator, 12–inch blowoffs	176.00	MS	Perry
Mainline valve	36–inch valve operator, 12–inch blowoffs	190.53	MS	Perry
Future interconnect tap	16–inch tap valve operator	195.27	MS	Greene
Lucedale Compressor Station and FGT M&R station	12,891-hp compressor station; M&R runs, assoc. piping	212.34	MS	George
Mainline valve	36–inch valve operator, 12–inch blowoffs	221.59	MS	George
Mainline valve	36–inch valve operator, 12–inch blowoffs	236.36	MS	Jackson
Future interconnect tap	16–inch tap valve operator	250.40	AL	Mobile
Mainline valve	36–inch valve operator, 12–inch blowoffs	250.77	AL	Mobile
Mainline valve	36–inch valve operator, 12–inch blowoffs	258.44	AL	Mobile
Lateral tap valve	24–inch valve operator, 8–inch blowoffs	269.07	AL	Mobile
Pig receiver/Gulfstream M&R Station	42–inch receiver, 36–inch receiver valve, M&R runs, assoc. piping	269.08	AL	Mobile
Rock Road lateral	1.15 miles of 24–inch-diameter pipeline (ties in to SESH mainline at MP 269.07)	0.00 – 1.15[1/]	AL	Mobile
Common M&R stations filter separator	Filter separator, assoc. piping	1.09[1/]	AL	Mobile
Rock Road meter site includes the relocated mobile gas services M&R station, Transco (south) M&R Station, and Gulf South (south) M&R Station	M&R runs, assoc. piping	1.11[a]	AL	Mobile
Mobile gas services lateral	370 ft of 6–inch-diameter pipeline (ties in to Rock Road lateral)	1.11[a]	AL	Mobile
Transco (south) lateral	350 ft of 16–inch-diameter pipeline (ties in to Rock Road lateral)	1.13[a]	AL	Mobile
Gulf South (south) lateral	175 ft of 16–inch-diameter pipeline (ties in to Rock Road lateral)	1.15[a]	AL	Mobile

[a] MPs associated with the Rock Road lateral
AL = Alabama
CP = Carthage to Perryville Project
FGT = Florida Gas Transmission
ft = foot/feet
hp = horsepower
LA = Louisiana
M&R = meter and regulator
MP = milepost
MS = Mississippi
SESH = Southeast Supply Header
SONAT = Southern Natural Gas
TETLP = Texas Eastern Transmission Limited Partnership

Metering and flow control for natural gas delivered to the proposed Project would be accomplished via M&R facilities provided at the 13 proposed stations (see Table 2.1-2). Similarly, facilities at the proposed M&R stations located at interconnects would be used to meter the flow and adjust the pressure of natural gas delivered to those systems. Each M&R station would include skid-mounted M&R equipment, a filter separator, and a control building housed within a fenced perimeter.

Eighteen mainline valves (block valves) would be installed along the proposed Project to enable portions of the pipeline to be shut down or isolated, if necessary. The mainline valves would be installed in areas easily accessible to operating personnel and at intervals specified in U.S. Department of Transportation (DOT) safety standards for natural gas pipelines. Each mainline valve assembly would consist of a 42-inch-diameter or 36-inch-diameter belowground valve with 12-inch-diameter piping and valves extending aboveground for blowdown and bypass. These sites would typically have security fencing and a lockable gate around the aboveground piping and valves.

2.2 LAND REQUIREMENTS

The land requirements of the proposed Project are summarized in Table 2.2-1. This summary identifies the construction and operational land requirements of the proposed pipeline, aboveground facilities, and additional temporary workspaces (ATWSs). Temporary land requirements for the proposed Project during construction would total 4,021.20 acres including the proposed pipeline construction right-of-way, construction areas for aboveground facilities, ATWSs, pipeyards/wareyards, and access roads. Of this total, SESH would retain 1,697.10 acres as permanent easements associated with operation of the proposed pipeline and aboveground facilities. Following construction, SESH would restore the remaining 2,324.10 acres to preconstruction conditions or allow the acres to revert to their former use. The land requirements of the proposed Project facilities are discussed further in the following subsections, and additional information is provided in Section 3.8.

2.2.1 Pipeline Facilities

SESH has proposed a nominal construction right-of-way width of 125 feet (ft) for the first 104 miles of 42-inch-diameter pipeline and 100 ft for the remaining 165 miles of 36-inch-diameter pipeline along upland sections of the proposed pipeline. The proposed pipeline would generally be installed using conventional, open-cut trenching techniques (see Section 2.3.1). Figure 2.2.1-1 illustrates the typical right-of-way cross section for the 36-inch- and 42-inch-diameter pipelines. A review of proposed 42-inch- diameter pipe construction techniques and cross section figure, and the use of a 100 foot right-of-way for similar size pipe in the area indicate SESH's need for a nominal right-of-way width of 125 ft for topsoil and spoil storage are not justified. We believe that since the proposed Project is new construction it should limit its impact by making efficient use of a 100-foot nominal right-of-way. Therefore, **we recommend that:**

- **Prior to construction, SESH should reduce the width of the construction right-of-way to 100 feet in width for its 42-inch diameter pipeline (MP 0.0 to MP 104). SESH should identify on the revised alignment sheets, and provide a table listing by MP, all additional temporary workspaces beyond the 100-foot nominal construction right-of-way for any area where SESH believes additional right-of-way is required due to site-specific circumstances. The work space table should include justification for the extra work space (such as association with road, foreign utilities, waterbody, and wetland crossings, two-tone construction areas, or extensive top soil segregation) and must be approved in writing by the Director of OEP.**

A reduced 75-ft-wide construction corridor would be used in wetlands. A nominal construction right-of-way width of 75 ft is proposed for pipeline laterals. These construction right-of-way widths would encompass a 50-ft-wide permanent right-of-way centered over the proposed pipeline; an additional 75-, 50-, or 25-ft-wide temporary construction work area in upland areas; and a 25-ft-wide temporary construction work area in wetland work areas. Figure 2.2.1-2 illustrates the typical proposed pipeline construction right-of-way requirements through wetland areas.

The FERC regulations (18 CFR § 380.15[d][1]) give primary consideration to the use, enlargement, or extension of existing rights-of-way over developing a new right-of-way to reduce potential impacts on potentially sensitive resources. In general, installation of new pipeline along existing, cleared rights-of-way (e.g., pipeline, power line, road, or railroad) may be environmentally preferable to construction along new rights-of-way. Where possible, SESH's proposed construction right-of-way would collocate with or parallel existing utility rights-of-way. As shown in Figure 2.2.1-1, SESH's requested construction right-of-way would partially overlap with existing right-of-ways.

TABLE 2.2-1
Locations and Land Requirements for the Proposed SESH Project

Facility	Location	Land Affected during Construction (acres)	Land Affected during Operation (acres)
Pipeline Facilities (42-inch- and 36-inch-diameter)[a]			
Pipeline	Various	3,338.75	1,592.07
SESH laterals[b]	Various	15.95	9.57
	Subtotal Pipeline Facilities	**3,354.70**	**1,601.64**
Aboveground Facilities			
Compressor Stations			
Delhi Compressor Station	Richland, LA	14.28	14.28
Gwinville Compressor Station	Jefferson Davis, MS	18.90	18.90
Lucedale Compressor Station	George, MS	22.28	14.59
Booster Stations			
Collins Booster Station	Covington, MS	19.73	19.73
Petal Booster Station	Forrest, MS	16.74	9.33
M&R Stations			
CEGT CP Expansion M&R Station	Richland, LA	0.92	0.92
Gulf South Mississippi Expansion M&R Station	Richland, LA	0.92	0.92
Columbia Gulf M&R Station	Richland, LA	0.92	0.92
CEGT 24-inch M&R Station	Richland, LA	0.92	0.92
Texas Eastern M&R Station	Copiah, MS	0.95	0.95
Rock Road Meter Site[c]	Mobile, AL	4.81	4.81
Pig receiver/Gulfstream M&R Station	Mobile, AL	1.44	1.44
Pig receiver and launcher	Lawrence, MS	0.92	0.35
Future interconnect taps[d]	Various	0.0	0.0
Other mainline valves[e]	Various	0.0	0.0
	Subtotal Aboveground Facilities	**103.73**	**88.06**
Extra Workspace			
ATWS	Various	224.89	0.00
Access roads[f]	Various	7.40	7.40
Pipeyards/wareyards			
Tallulah	Madison, LA	51.31	0.00
Letourneau	Warren, MS	36.10	0.00
Wesson	Copiah, MS	3.35	0.00
Georgetown	Copiah, MS	66.18	0.00
New Hebron	Jefferson Davis, MS	9.68	0.00

TABLE 2.2-1 (continued)
Locations and Land Requirements for the Proposed SESH Project

Facility	Location	Land Affected during Construction (acres)	Land Affected during Operation (acres)
Highway 11	Forrest, MS	21.92	0.00
Highway 98	Perry, MS	6.24	0.00
Lucedale 1	George, MS	35.01	0.00
Lucedale 2	George, MS	60.84	0.00
Mobile	Mobile, AL	39.85	0.00
	Subtotal for Extra Workspace	**562.77**	**7.4**
	Total	**4,021.20**	**1,697.10**

Notes:
[a] Construction area includes all temporary workspace and permanent easement impact acreages.
[b] The construction and operation acreages associated with minor laterals for meter stations are included in the acreages reported for the meter station or adjacent aboveground facility.
[c] The Rock Road meter site includes impacts for the Mobile Gas Services, Transco (South), and Gulf South (South) M&R stations, PAR - RRL2, and the filter separator.
[d] These facilities are located entirely within the pipeline PE; therefore, their land requirements are included in the pipeline PE total.
[e] These other mainline valves (not collocated with compressor or booster stations) lie within the pipeline PE; therefore, their land requirements are included in the pipeline PE total.
[f] Only land requirements associated with construction of the new access roads to the aboveground facilities are included, excluding PAR RRL2, for which impacts are captured within the Rock Road meter site.
CEGT = CenterPoint Energy Gas Transmission Company
M&R = meter and regulator
PAR = permanent access road
PE = permanent easement
RRL = Rock Road lateral

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Typical Right-of-Way Cross Section
36-inch- and 42-inch-Diameter Pipeline

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Typical Construction Widths through Wetland Areas
Foreign Utility Right-of-way

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SESH indicated that its permanent right-of-way would be offset by 10 ft from adjacent utilities. Because of the number of large diameter pipelines in the project area, the cumulative width of the permanently maintained right-of-ways is reducing the amount of forests and putting increased restrictions on the landowner's use of the property. To limit these impacts, we believe that new construction should make more efficient use of the existing right-of-ways. Therefore, **we recommend that:**

- **SESH should modify its project right-of-way requirements and file with the Secretary revised figures and alignment sheets with the Implementation Plan to reflect removal of the proposed 10-foot buffer between the edge of the permanent right-of-way and foreign pipeline rights-of-way.**

Along some sections of the proposed Project route (some major waterbody, road, and railway crossings), pipeline installation would be accomplished via horizontal directional drill (HDD) or bored crossings (see Section 2.3.2). In these areas, the only land requirements would consist of the permanent 50-ft-wide right-of-way, as additional temporary construction work areas would not be required in association with these subsurface installation techniques.

Land requirements for the pipeline construction right-of-way would total 3,354.70 acres (see Table 2.2-1). Following construction and restoration of the construction right-of-way, the 50-ft-wide permanent easement retained by SESH along the length of the proposed pipeline would encompass 1,601.64 acres.

2.2.2 Aboveground Facilities

The land requirements for the proposed aboveground facilities would total 103.73 acres during construction and 88.06 acres during operation (Table 2.2-1). The proposed aboveground facilities include 3 compressor stations, 2 booster stations, 13 M&R stations, 18 mainline valves, and 3 pig launcher and receiver facilities.

Construction and operation of the Delhi, Gwinville, and Lucedale compressor stations would encumber 14.28, 18.90, and 22.28 acres of land, respectively. The land within the fenced perimeter of the compressor station facilities would be occupied by buildings, piping, and other equipment. SESH may pave, cover with gravel, or landscape portions of these sites, depending on facility operations and maintenance requirements. A pig launcher/receiver would be located within the fenced perimeter of Delhi and Lucedale compressor station sites. Construction and operational land requirements of the CEGT CenterPoint, Gulf South Mississippi Expansion, Columbia Gulf, and CEGT 24-inch M&R stations would be 0.92 acre each. The TETLP M&R Station would require 0.95 acre of land and the combined pig receiver/Gulfstream M&R Station would require 1.44 acres of land for construction and operation. The Mobile Gas Services, Transco (south), and Gulf South (south) M&R stations would be located within the Rock Road meter site and would require 4.81 acres. The remaining four M&R stations are within the grounds of the compressor or booster station sites.

Two of the mainline valves would be located within the confines of the Delhi Compressor Station and Collins Booster Station and would not result in additional land requirements beyond that noted for those facilities. The remaining mainline valve sites would consist of a 25-ft by 25-ft fenced area installed within the confines of the permanent pipeline right-of-way. Thus, construction and operation of those facilities would not result in land requirements beyond that already noted for the permanent pipeline right-of-way.

2.2.3 Extra Work Areas

2.2.3.1 Additional Temporary Workspaces

ATWSs would be required for construction at road crossings, railroad crossings, crossings of existing pipelines and utilities, stringing truck turnaround areas, wetland crossings, HDD entrance and exit pits, and open-cut waterbody crossings. SESH would locate these ATWSs adjacent to the construction right-of-way and use them for such activities as topsoil and spoil storage, staging, equipment movement, material stockpiles, and pull string assembly associated with HDD installation. The proposed Project would require 2,582 ATWSs, totaling 224.89 acres. An individual ATWS would range in size from less than 0.1 acre to 2.0 acres. ATWSs would be returned to their preconstruction condition and former usage following completion of construction activities. Additional information on ATWSs is provided in Sections 3.5, 3.6 and 3.8. We note that SESH has requested some relatively large ATWSs. These ATWSs may substantially increase the area of disturbance and the amount of forest clearing. Our review of maps and information provided by SESH indicates that the slopes and soil types in the project area may not justify the size of the requested ATWS. To address the issue of ATWSs impacts refer to Section 3.5.2.1 and the discussion of vegetative communities of special concern.

2.2.3.2 Pipeyards/Wareyards

SESH has proposed the use of 10 off-site pipeyards/wareyards that would consist of warehouses or open lots located in areas of existing commercial or industrial use. The identified yards would range in size from 3.35 to 66.18 acres, and the total land requirements for these facilities would be 330.48 acres. The general locations of the proposed yards are identified on the facility location maps included as Appendix B of this EIS. All yards would be leased from willing landowners and, upon completion of construction activities, would be returned to their preconstruction condition and former usage.

Additional pipeyards/wareyards beyond those currently identified could be required during construction of the proposed Project. If additional pipeyards/wareyards were required, SESH would use previously disturbed and/or industrial lands for those facilities to the extent practicable. If such sites cannot be identified and undeveloped property must be used, SESH would perform all necessary environmental surveys and provide this information to FERC for approval prior to use of the site.

2.2.3.3 Access Roads

SESH would use existing roads to the extent possible to facilitate equipment and material access along the proposed Project route. SESH has indicated that construction of the proposed pipeline and aboveground facilities would require the temporary use of 236 existing access roads of varying lengths and construction. No new access roads are being proposed for the construction or operation of the pipeline. Following construction, SESH would restore all temporary access roads used for construction in accordance with landowner agreements.

In addition to temporary use of existing access roads, permanent upgrade of existing or construction of new permanent access roads would also be required in association with the proposed Delhi and Lucedale compressor stations, Collins Booster Station, and the CEGT CenterPoint, Gulf South Mississippi Expansion, TETLP M&R stations and Rock Road lateral. Construction and operation of access roads at these facilities would total 1.88 miles and permanently affect 7.40 acres, assuming a standard access road width of 50 ft. All new permanent access roads would be routed through previously cleared or disturbed areas to the extent practicable. Additional information on access roads is provided in Section 3.8 and shown on the facility location maps provided as Appendix B of this EIS.

2.3 CONSTRUCTION PROCEDURES

The proposed pipeline facilities would be designed, constructed, operated, and maintained in accordance with the DOT regulations under 49 CFR Part 192, "Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards," and other applicable federal and state regulations. Among other design standards, these regulations specify pipeline material selection; minimum design requirements; protection from internal, external, and atmospheric corrosion; and qualification procedures for welders and operations personnel. More detailed safety information is provided in Section 3.12. In addition, SESH would comply with the siting and maintenance requirements in 18 CFR § 380.15 and other applicable federal and state regulations.

To minimize construction-related effects, SESH has agreed to adopt the January 17, 2003, versions of our "Upland Erosion Control, Revegetation, and Maintenance Plan" (Plan) and our "Wetland and Waterbody Construction and Mitigation Procedures" (Procedures), with some minor exceptions or alternative measures, as described in the Applicant's filing to FERC. The FERC Plan and Procedures are available for review on the FERC website at http://www.ferc.gov/industries/gas/enviro/guidelines.asp. SESH's Plan and Procedures (submitted with the filed application) identify baseline mitigation measures for minimizing erosion and enhancing revegetation in upland areas and baseline mitigation measures for minimizing the extent and duration of construction-related disturbance on wetlands and waterbodies. SESH has also developed several Project-specific plans to avoid or minimize environmental impacts during construction. SESH has prepared a "Project Spill Prevention, Containment, and Control (SPCC) Plan" (submitted with the filed application), which describes the management of hazardous materials such as fuels, lubricants, and coolants that would be used during construction. Site-specific plans would be developed for each construction spread once the construction contractors have been selected. A Contamination Contingency Plan has been prepared by SESH in the event contaminated media (soil or groundwater) is encountered (see Section 3.2). In addition, an HDD contingency plan for inadvertent releases of drilling mud from the boring to the stream channel (i.e., frac outs) would be developed and submitted to the FERC. The contingency plan would describe the procedures that would be implemented to monitor for, contain, and clean up any inadvertent releases of drilling fluid during HDD operations (see Section 3.3). Additionally, SESH has developed an "Unanticipated Discoveries Plan" (submitted with the filed application) that would guide the treatment of any unanticipated discoveries of cultural resources or human remains during construction (see Section 3.10).

2.3.1 General Pipeline Construction Procedures

Prior to initiating construction-related activities, SESH would secure right-of-way easements from private landowners and managers of public lands whose properties would be crossed by the pipeline route. All owners, tenants, and lessees of private land and lessees and managers of public lands along the right-of-way would be notified in advance of construction activities that could affect their property, business, or operations. If the necessary land rights or easements cannot be obtained through good-faith negotiations with landowners and the proposed Project has been certificated by the FERC, SESH could use the right of eminent domain granted to it under Section 7(h) of the NGA to obtain a right-of-way. SESH 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 court according to state laws that set forth the procedures for the use of eminent domain once the FERC issues a Certificate. SESH would be required to proceed through the appropriate state or federal court to condemn land for which it has received a Certificate from the FERC. The FERC does not take part in such proceedings.

The majority of the proposed pipeline construction process would be accomplished using conventional open-cut methods which typically include the steps described below. The proposed methods for accomplishing pipeline installation across waterbodies and wetlands, as well as other specialized construction procedures, are described in Section 2.3.2. Conventional overland installation of pipeline is best represented as a moving assembly line with a construction spread (crew and equipment) proceeding along the construction right-of-way in a continuous operation as depicted in Figure 2.3.1-1. Construction at any single point along the pipeline, from right-of-way surveying and clearing to backfill and finish grading, would last approximately 6 to 10 weeks. The entire process would be coordinated to limit the time of disturbance to an individual area thereby minimizing the potential for erosion and the loss of normal use. SESH indicates that construction of the pipeline would entail the simultaneous activity of three individual construction spreads over the proposed Project route.

SESH would implement dust control measures during construction, as necessary, and at the discretion of the contractor supervisor, environmental inspector (EI), or on-site chief construction inspector. Measures to minimize dust would primarily involve use of water trucks to dampen the right-of-way under dry-dusty conditions. Special consideration would be given to residential and roadway areas where clear visibility is essential.

Typical sequential operations of pipeline construction would include the following steps:

- survey and mark the route and approved workspace area;
- install erosion and sediment controls;
- clear and grade the site;
- excavate a new trench to the proper depth for the pipeline;
- place the pipe joints, each approximately 40 to 60 ft long, adjacent to the ditch line within the right-of-way;
- bend the new pipe joints, as needed, to follow the pipeline route and contours of the terrain;
- weld the pipe together;
- visually inspect and non-destructively test the weld area to verify the integrity of the weld;
- coat the weld area with an approved coating to provide corrosion protection;
- place the new pipe section in the trench, tie into the previously laid section(s), and backfill;
- restore the grade of the work area to previous contours; and
- conduct final clean-up, restoration, and seeding.

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Figure 2.3.1-1
Typical Pipeline Construction Sequence

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Mainline valve assemblies would be prefabricated and delivered to the construction work area for installation within the permanent easement during pipeline construction.

Once SESH has constructed a segment of pipeline, they would perform the following additional tasks:

- conduct hydrostatic testing to ensure the integrity of the new pipeline;
- perform in-line tool inspections of the new pipeline segment; and
- tie into existing pipeline(s), purge, and pack the new pipeline with gas.

2.3.1.1 Right-of-Way Survey and Fence Crossings

After right-of-way easements have been obtained, the pipeline centerline, construction right-of-way, and ATWS would be surveyed and staked. SESH would contact the appropriate state "One-Call" system to have existing underground utilities located, identified, and flagged to prevent accidental damage during pipeline construction. Other sensitive resources such as wetland boundaries, cultural resources, and any areas of protected species habitat would also be marked.

Where fences are encountered along the construction right-of-way, a fence crew would install temporary fences to confine livestock to existing areas off the right-of-way and to prohibit or otherwise control public access across the right-of-way. This work would include installing new posts to brace the areas on either side of the proposed cut to avoid damage to the existing fence or wall. Temporary gates would be installed as necessary.

2.3.1.2 Sediment Controls

To contain disturbed soils in upland areas and minimize the potential for sediment loss off the right-of-way or to wetlands and waterbodies, temporary erosion controls would be installed immediately after initial disturbance of soils and maintained throughout construction. Erosion and sedimentation control devices would be installed in accordance with SESH's Plan and Procedures and a Stormwater Pollution Prevention Plan (SWPPP), should one be required by the permitting agencies.

2.3.1.3 Clearing and Grading

The construction right-of-way and ATWSs would be cleared and graded, where necessary, to provide a relatively level surface for trench-excavating equipment and the movement of other construction equipment; however, natural drainage patterns would be preserved to the extent possible. Brush, trees, roots, and other obstructions such as large rocks and stumps would be cleared from all construction work areas. Non-woody vegetation, such as crops and grasses, in areas where grading is not required, would be mowed to avoid damage to root systems. To protect properties located adjacent to the proposed Project corridor, brush and trees would be felled parallel to and within the construction right-of-way where feasible. Marketable timber would be cut to standard lengths and stacked at the edge of the right-of-way or removed. Tree stumps would be removed from within the permanent right-of-way. Within the temporary construction right-of-way, stumps would either be removed or ground to a suitable height to allow safe passage of equipment. Cleared woody debris would be chipped and left in place or disposed of according to local restrictions, regulatory requirements, and landowner agreements.

Topsoil would be stripped and segregated in residential areas, actively cultivated or rotated croplands, pastures, hayfields, and other areas where requested by a land management agency or landowner. Topsoil would be removed to its actual depth, up to a maximum of 12 inches, and stockpiled separately from the subsoil excavated from the pipeline trench. Typically, topsoil would be stripped from the area directly over the pipeline ditch and the adjacent subsoil spoil storage area (see Figure 2.3.1-2), but landowners would be provided with the option of topsoil segregation across the full construction work area. Additional information on topsoil segregation is provided in Section 3.2.

2.3.1.4 Trenching

Before beginning excavation, SESH would contact the appropriate state ”One-Call” system to have existing underground utilities located, identified, and flagged. A trench would then be excavated using rotary wheel ditching machines, backhoes, or rippers. Excavated materials would normally be stored on the non-working side of the trench (see Figure 2.3.1 2). Temporary trench plugs (or barriers) would be used to create segments within the open trench to reduce erosion and allow access across the trench. Trench plugs would typically consist of either compacted subsoil or sandbags placed across the ditch (soft plugs) or short, unexcavated portions of trench (hard plugs). Trench dewatering could also be required along portions of the route.

The trench would be excavated to a depth that would allow space for the pipeline, pipeline bedding, and the minimum amount of top cover required by DOT specifications. The trench would typically be excavated to a depth of 7 ft for the 36-inch-diameter pipe and 8 ft for the 42-inch-diameter pipe to enable the proposed pipeline to be installed at a minimum depth of 3 ft (measured from the top of the pipe segment) below the ground surface. In agricultural areas, the depth of cover would be increased such that the top of the pipeline would be a minimum of 4 ft below the ground surface. The actual installation depth of the pipeline would vary and would range from these minimum depth requirements to that depth required for safe crossing of a feature such as a road, highway, railroad, or waterbody. At crossings of utilities or foreign pipelines, the proposed pipeline would also generally be installed at a greater depth to provide for a minimum clearance of 12 inches or the depth that may be required by state or local regulations, whichever provides greater protection.

Areas of bedrock that might be encountered along the proposed Project route should be easily workable with standard construction equipment and techniques, and SESH does not anticipate the need for blasting associated with trench excavation. However, if blasting were to be required, such work would be accomplished in accordance with SESH’s Plan and Procedures.

2.3.1.5 Pipe Stringing, Bending, and Welding

Sections of pipe would be delivered to the job site and temporarily placed or “strung” adjacent to the excavated pipeline trench, where they would be bent as necessary to follow the natural grade and direction changes of the right-of-way. Following stringing and bending, the ends of the pipeline would be carefully aligned and welded together. The welds would be visually and radiographically (i.e., x-ray) inspected to ensure structural integrity. Those welds that do not meet established specifications would be repaired or replaced.

A factory-applied, fusion-bonded epoxy external coating (or similar coating technique) would cover and protect the delivered pipeline sections. Following welding, the previously uncoated ends of the pipe would be coated at all joints with material compatible with the factory-applied coating in preparation for installation. The coating on the remainder of the completed pipe section would be inspected for defects and repairs would be made to any damaged areas prior to lowering the pipe into the trench. At some locations, it may be necessary to provide negative buoyancy in the form of concrete weights, a concrete coating, pipe sacks, and/or soil anchors.

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Section 2.3.1
Figure 2.3.1-2
Typical Trench Spoil Area and Topsoil Stripping

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2.3.1.6 Lowering-in and Backfilling

Prior to lowering the pipeline, the trench would be cleaned of debris and foreign material and dewatered as necessary. Trench dewatering, which would entail pumping accumulated groundwater or rainwater from the trench to stable upland areas, would be performed in accordance with applicable local, state, and federal permitting requirements, as well as SESH's Plan and Procedures. In areas of rock, the bottom of the trench would be padded with sand, gravel, screened soils, sandbags, or support pillows to protect the pipe coating. However, topsoil would not be used as padding material. The pipeline would then be lowered into the trench by appropriately spaced, sideboom tractors working in unison to avoid buckling of the pipe. Trench breakers would be installed at regular intervals where appropriate to prevent subsurface erosion and flow of water between the trench and crossed waterbodies, wetlands, and near-surface groundwater.

After the pipeline is lowered into the trench and adequately protected, previously excavated materials would be used to backfill the trench. Any excess excavated materials or materials deemed unsuitable for backfill would be evenly spread over the right-of-way or disposed of in accordance with applicable regulations and landowner requirements. Backfilling would occur to existing grade or higher to accommodate future soil settlement.

2.3.1.7 Hydrostatic Testing

Once installation and backfilling are completed and before the proposed Project begins operation, the pipeline would be hydrostatically pressure tested in accordance with DOT safety standards (49 CFR Part 192) to verify its integrity and to ensure its ability to withstand the MAOP. Hydrostatic testing would consist of installing a hydrostatic test cap and manifold, filling the pipeline with water, pressurizing the pipeline to its MAOP, and maintaining that test pressure for a specified period of time. The entire pipeline would be tested, but typically, extended segments of pipeline would be tested individually. Any leaks detected during the test would be repaired, and the pipeline would be re-tested.

Water used for hydrostatic testing would be obtained from surface water sources, and no biocides or other hydrostatic test water additives would be added to the test water. After hydrostatic testing is completed, the test water would either be pumped to the next segment of pipeline to be tested or discharged in upland areas using energy dissipation devices to minimize erosion. Hydrostatic test water would be obtained from surface water sources and discharged in accordance with applicable regulations and in accordance with SESH's Plan and Procedures. Additional information on hydrostatic testing is provided in Section 3.3.

Once a segment of pipe has been successfully tested, it would be cleaned and dried using mechanical tools (pigs) moved through the pipeline with pressurized, dry air. The hydrostatic test cap and manifold would then be removed, and the pipe would be connected to the remainder of the pipeline using the welding and inspection procedures describe above.

2.3.1.8 Cleanup and Restoration

Within 20 days of completion of backfilling the trench, or as soon as possible, all remaining trash, debris, surplus materials, and temporary structures would be removed from the right-of-way and disposed of in accordance with applicable federal, state, and local regulations. All disturbed areas would be finish-graded and restored as closely as possible to preconstruction contours. Permanent erosion control measures would also be installed during this phase in accordance with SESH's Plan and Procedures. Topsoil previously segregated from the trench material in all agricultural and residential areas would be spread uniformly across the construction right-of-way, and the topsoil and subsoil in agricultural areas would be tested for compaction along the disturbed corridor.

SESH would accomplish vegetation restoration according to its Plan and Procedures and would begin within 10 days of final grading. After the soil is readied for planting or seeding in areas where SESH and landowners have negotiated agreements, SESH would reseed or replant according to those agreements. To provide permanent erosion control along the right-of-way, all other upland areas disturbed by construction would be fertilized, limed, and seeded in accordance with the prescribed dates and seed mixes specified by the local soil conservation authorities or land management agencies. SESH would not fertilize, lime, or mulch wetland areas unless directed to do so by state or local regulatory agencies.

Disturbed pavement and other road surfaces along access roads would be restored to preconstruction or better conditions unless otherwise specified by the property owner and approved by applicable regulatory agencies. Likewise, any private or public property damaged during construction, such as fences, gates, and driveways, would also be restored to original or better condition consistent with individual landowner agreements.

SESH would install pipeline markers and warning signs along the pipeline centerline at specified intervals to identify the pipeline location, specify SESH as the operator of the pipeline, and provide telephone numbers for emergencies and inquiries.

2.3.2 Specialized Pipeline Construction Procedures

2.3.2.1 Waterbody Crossings

The FERC procedures define a water body as any natural or artificial stream, river, or drainage with perceptible flow at the time of crossing, or permanent waterbodies such as ponds and lakes. Installation of the proposed Project pipeline across rivers and streams would be accomplished in accordance with SESH's Plan and Procedures and all applicable permits. SESH's Plan and Procedures identifies the baseline mitigation measures (from preconstruction planning through construction, restoration, and monitoring) for minimizing the extent and duration of project-related disturbance to waterbodies. The waterbody crossing measures specified in SESH's Plan and Procedures are based on industry standard practices.

SESH would accomplish installation of the pipeline across waterbodies using either a "wet" or "dry" construction technique. A "wet" or open-cut crossing involves trenching and installing the pipeline without isolating the construction work area from stream flow. The objective of this method is to complete the crossing as quickly as practical to minimize the duration of impacts on aquatic resources. A "dry" crossing involves isolating the construction zone from the stream flow by directing water flow through a flume pipe (flume crossing), by damming the flow and pumping the water around the construction area (dam and pump crossing), or by directionally drilling and installing the pipeline beneath the waterbody (HDD). The primary objectives of these methods are to minimize siltation of the waterbody and allow for a more extended construction period. Each of these techniques is discussed further below.

Over 650 waterbodies would be crossed by the proposed Project. SESH has proposed the use of either open-cut or HDD techniques for all of these crossings. However, SESH has also proposes that, except for those streams for which HDD is proposed, the actual method of waterbody crossing would be determined based on site-specific conditions and waterbody characteristics at the time of construction.

Additional information on the proposed waterbody crossing procedures and potential environmental consequences is presented in Section 3.3.

Equipment

A necessary early step in the construction process would be mobilization and positioning of necessary equipment at the stream or river crossing. To facilitate equipment deployment, SESH would construct a temporary bridge across the waterbody during clearing and grading activities to allow construction equipment to cross. With the exception of the clearing crew, which is allowed one pass through the waterbody before the bridge is installed, construction equipment would be required to use the bridge. The bridges and any support structures would be removed immediately after restoration is complete. If bridges were not installed at a state-designated fishery stream, equipment would be required to move around the waterbody to gain access to the other side.

In general, construction equipment and vehicle refueling and lubrication would take place in upland areas located more than 100 ft from the edge of the stream, river, or wetland. In addition, fuels, lubricating oils, petroleum products, and other hazardous materials would not be stored within 100 ft of an aquatic resource. The EI would check all equipment for leaks prior to SESH beginning work in the water body or wetland. However, instances could arise where equipment refueling and lubrication near or in a stream or river would be necessary. For example, stationary equipment, such as a hydrostatic test water pump, could need to operate continuously on the bank of a waterbody and could require refueling in place. SESH's SPCC Plan addresses the handling of fuel and other hazardous materials in or within 100 ft of a waterbody. If SESH determines that refueling would be needed in or near a stream or wetland, they would prepare a variance request for FERC and would not initiate construction at this location until approval has been received.

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

Clearing

Clearing would involve removing trees and brush from the permanent easement and temporary workspace. SESH would clear woody vegetation to the edge of the waterbody; however, they would leave a 10-ft-long herbaceous strip adjacent to the crossing until immediately before construction to provide a natural sediment filter and minimize the potential for erosion immediately adjacent to the waterbody. Initial grading of the herbaceous strip would be limited to what is needed to install the bridge and, where a large grade cut is needed, to the extent necessary to safely implement the construction activity.

During clearing, SESH would install and maintain sediment barriers adjacent to the waterbody and within construction work areas as needed to minimize the potential for sediment runoff. SESH could install and maintain a drivable berm across the right-of-way in lieu of a silt fence or straw bale barrier.

Blasting In Streams

No blasting is anticipated to be required for construction of the proposed Project.

Flume Crossing Method

SESH could choose to cross specific waterbodies using the flume crossing method. This method would involve diverting the flow of the stream across the alignment through one or more flume pipes placed in the stream. The flume pipes must be sufficient in number and adequate in size to accommodate the highest anticipated flow during construction. After placing the flume pipe(s) in the stream, sand or pea gravel bags would be placed upstream and downstream of the proposed trench. These bags serve to divert stream flow through the flume pipes and away from the construction area.

Backhoes, located on both banks of the stream, would then excavate a trench under the flume pipe(s) in the isolated stream bed. Spoil excavated from the stream trench would be placed in a straw bale/silt fenced containment area located a minimum of 10 ft 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 be immediately backfilled with the stored native spoil. Stream banks would be immediately stabilized. Once restoration is complete, the flume pipes and pea gravel bags would be removed, and normal flow would be re-established.

Dam and Pump Crossing Method

The dam and pump crossing method would involve constructing temporary sand or pea gravel bag dams upstream and downstream of the proposed crossing site and using a high-capacity pump to divert water around the construction area. Energy dissipation devices, such as plywood boards, would be placed at the discharge point on the downstream side to prevent streambed scour. A portable pump would be used, as necessary, to remove any standing water from between the dams, thereby creating a “dry” construction area. This water would be pumped into an energy dissipation/sediment filtration dewatering structure such as a straw bale/silt fence or a geotextile filter bag located away from the stream banks to prevent heavily silt-laden water from flowing into the waterbody.

Once the construction area between the dams is dry, backhoes positioned on both banks would excavate the trench across the stream. Spoil excavated from the trench would be temporarily stored in a straw bale/silt fence containment area located a minimum of 10 ft from the edge of the stream bank. Leakage from the dams or subsurface flow from the streambed could cause water to accumulate in the trench. Accumulating trench water would be periodically pumped out, as necessary, and discharged into a dewatering structure located away from the stream bank.

After trenching is accomplished, a prefabricated segment of pipe would be installed in the trench, and the streambed portion of the trench would be immediately backfilled with stored streambed spoil. Following completion of restoration, the dams would be removed, and normal flow would be re-established.

Wet Trench Crossing Method

This crossing method would involve trenching through a stream while water continues to flow. After clearing the stream approaches and installing sediment control measures (including earthen trench plugs), track hoes positioned on both banks would excavate the trench in the flowing stream. Spoil excavated from the trench would be placed in a straw bale/silt fence containment area located a minimum of 10 ft from the edge of the waterbody for temporary storage. Trench plugs would be left in place until immediately before pipe installation. Trench plugs would serve to separate the trench in the stream from the upland trench, thereby preventing muddy water from flowing into the stream. Once trenching is accomplished, a prefabricated segment of pipe would be installed, and the trench would be backfilled with stored streambed spoil.

Restoration

Completed stream crossings using the flume, dam and pump, or wet trench technique would be stabilized 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 the stream banks to prevent erosion and encourage reestablishment of vegetation cover. Permanent slope breakers would be installed adjacent to stream banks with the potential for erosion to affect streams, as needed. Where the flume technique is used, stream banks would be stabilized before removing the flume pipes and returning flow to the temporarily isolated channel segment.

Seeding of disturbed stream approaches would be completed after final grading in accordance with SESH's Plan and Procedures, weather and soil conditions permitting. Sediment barriers, such as silt fence or straw bales, would be maintained across the right-of-way until a permanent vegetation cover is established.

Mitigation

Mitigation measures would be implemented to minimize impacts to the aquatic environment during construction as described in SESH's Plan and Procedures. Construction would be scheduled so that the trench would be excavated immediately prior to pipe-laying activities. The duration of construction would be limited to 24 hours for minor waterbodies (10 ft wide or less) and 48 hours for intermediate waterbodies (greater than 10 ft wide but less than or equal to 100 ft wide). In accordance with SESH's Plan and Procedures, excavated spoil would be stockpiled in the construction right-of-way at least 10 ft from the stream bank or in approved ATWSs and would be surrounded by sediment-control devices to prevent sediment from returning to the waterbody. The waterbody banks would be returned to as near preconstruction conditions as possible within 24 hours of completing all open-cut crossings.

Horizontal Directional Drill

HDD is a trenchless crossing method that could be used to avoid direct impacts to sensitive resources, such as waterbodies and wetlands, or infrastructure (e.g., roads, railways, etc.) by directionally drilling beneath them. HDD installation on the proposed Project would result in a pipeline that is installed beneath the ground surface by pulling the pipeline through a pre-drilled borehole. HDD installation would be typically carried out in three stages: 1) directional drilling of a small diameter pilot hole; 2) enlarging the pilot hole to a sufficient diameter to accommodate the pipeline; and 3) pulling the prefabricated pipeline, or pull string, into the enlarged borehole. Figure 2.3.2-1 illustrates a typical HDD installation process.

The pilot hole (i.e., approximately 12 inches in diameter depending on drill head and soil characteristics) would be drilled along a predetermined HDD bore. The drill head for the pilot hole would have a down-hole, hydraulic motor-powered drill bit attached to the drill string (pipe connecting the drill rig to the drill head). The hydraulic motor would convert hydraulic energy from drilling fluid or drilling mud pumped from the surface, to mechanical energy at the drill head, allowing for bit rotation without drill string rotation. Drill string would be added as the pilot hole progressed.

Directional control of the pilot hole drill would be achieved by using a non-rotating drill string with an asymmetrical leading edge. The asymmetry of the edge creates a steering bias, while the non-rotating aspect of the drill string allows the steering bias to be held in a specific position during advancement. The path of the drill head would be controlled using a magnetic steering tool positioned behind the drill head and, if needed, an electromagnetic survey system. The magnetic steering tool would measure the position (azimuth and inclination) of the drill head and transmit that information to a console at the drill station. If magnetic interference were encountered, an electromagnetic survey system would be used to monitor the path and progress of the drill head. This system would consist of a small diameter cable (less than 0.5 inch) laid out on the ground surface to form a rectangular coil. The long axis of the coil would be oriented along the path of the pilot hole. The coil would be energized to produce an electromagnetic field of known intensity and location. The position of the magnetic steering tool would be measured relative to the induced field.

After completion of the pilot hole, the HDD bore would be progressively reamed to a diameter about 12 inches larger than the pipeline diameter. Drilling fluid would be pumped through the reaming tools to aid in cutting, support the borehole, transport spoil back to the surface, and lubricate the trailing pipe. Upon completion of drilling and reaming, the drill string would extend from the entrance pit to the exit pit. Concurrent with reaming the bore, the pull string to be inserted in the HDD bore would be fabricated and laid out within the construction right-of-way or extra workspace areas extending from the HDD exit pit. The pull string would be connected to the drill string and pulled back through the bore. The pipeline would be neutrally buoyant in the drilling fluid, allowing it to be pulled through the HDD borehole.

Drilling fluid circulates through the bore during the pilot hole drilling and reaming process would be collected at the surface and processed to remove spoils, allowing the fluid to be reused. Excess spoils and drilling fluid would be treated and disposed of at an approved location in accordance with regulatory requirements, agreements, and permit conditions. The proposed HDD drilling fluid would consist of water and bentonite. Bentonite is a mixture of non-toxic clays and rock particles consisting of about 85 percent montmorillonite clay, 10 percent quartz and feldspars, and 5 percent accessory materials, such as calcite and gypsum. SESH has stated that it would not use any synthetic or potentially toxic drilling fluid additives during HDD activities.

A successful HDD would result in little or no impact to the waterbody being crossed. HDD is not without risk, however, as inadvertent drilling fluid releases could result if the fluid escapes containment at pits that would be excavated at the HDD entrance and exit points or if a “frac out” occurs. A frac out occurs when drilling fluids escape the drill borehole and are forced through the subsurface substrate to the ground surface. Frac outs occur most often in highly permeable soils during the entrance and exit phases of the pilot hole drill, as this is when the greatest pressures are exerted on the bore walls in shallow soils. Drilling fluid pressures in the borehole and drilling fluid pumping and return flow rates would be monitored to detect the potential occurrence of a frac out. If survey and monitoring procedures indicate that a frac out may have occurred, SESH would implement the corrective measures identified in the HDD Contingency Plan. In the event of a complete loss of drilling fluid circulation, which is potentially indicative of a frac out, the HDD operator would cease pumping of drilling fluids immediately, any surfaced drilling fluids would be contained, and cleanup procedures would commence. A discussion of the potential impacts of HDD on waterbodies and wetlands is provided in Section 3.3.

SESH is proposing using HDDs on certain waterbodies and some roadway crossings. Information on the waterbodies to be crossed via HDD is included in Appendix D, while the roadways to be crossed by HDD are identified in application filing to FERC. SESH proposes to use 31 separate HDD crossings to accomplish pipeline installation that include the crossings of 17 major waterbodies (greater than 100 ft wide). The NPS has not identified any waterbodies crossed by the Project as National Wild and Scenic Rivers (NPS 2006a). Section 3.3 identifies and describes the waterbodies that would be crossed using HDD techniques.

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Section 2.3.2
Figure 2.3.2-1
Typical Horizontal Directional Drill Installation Process

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2.3.2.2 Wetlands

Wetland construction would be conducted in accordance with best management practices described in SESH's Plan and Procedures. In addition, SESH would implement the SPCC Plan as needed to further minimize the potential for adverse effects to wetlands.

The method of pipeline construction and the required construction right-of-way width in wetlands depends largely on soil stability and other conditions. Stable temporary work surfaces could be required in wetlands where soils are saturated and unstable. Installing construction mats in the equipment travel lane is a typical method of stabilization. Typically, an ATWS would be located a minimum of 50 ft from the edge(s) of the wetland. However, if a riparian wetland is located adjacent to a waterbody, an ATWS could be required within the wetland itself.

Within the wetland, vegetation would be cut to ground level except over the trench where stumps would be removed. Grading and stump removal would be limited to the area over the trench except where safety conditions dictate additional removal on the working side of the right-of-way.

Unsaturated Wetlands

The construction procedures used to cross unsaturated wetlands are similar to those used on dry land. Excavated topsoil would be segregated in a manner similar to that used when crossing agricultural land. Temporary trench plugs would be installed in the trench at the edges of the wetland if the possibility exists for sediment-laden water to flow from uplands down the trench and into the wetland. Silt fences and/or straw bales would be installed at the edges of the construction work area if the possibility exists for temporarily stored spoil to flow into undisturbed areas of the wetland. Preconstruction contours would be restored after completion of construction.

Saturated Wetlands

Construction techniques in highly saturated wetlands could involve the "push" or "pull" construction techniques. These techniques would involve floating a prefabricated pipe section over the water-filled trench by either pushing or pulling it. With this method, the trench would be cut with a backhoe, dragline, clamshell dredge, or a combination of such equipment. The push and pull staging sites, pipe storage sites, and fabricating areas would be located outside the saturated portion of the wetland. Floats would be attached to the pipe to achieve positive buoyancy, and the floating pipe would be pushed or pulled into place. Once the pipe is in place, the floats would be removed, and the pipe would settle to the bottom of the trench. This operation would be repeated, as necessary, to complete the wetland crossing. Following placement of the pipeline, excavated material would be used to fill in the trench, and the original contours of the wetland would be re-established.

The wetlands that would be affected by construction of the proposed Project are described in Section 3.4. That section also provides further discussion of the wetland restoration and mitigation procedures that would be implemented by SESH.

2.3.2.3 Residential and Commercial Areas

Section 3.8 contains information concerning the locations of residences and structures within 50 ft of the construction work area. Specialized construction methods SESH would use near residences are discussed in SESH's Plan and Procedures. SESH would make every effort to ensure that construction-related impacts to residences and residential areas are minimized and that cleanup is quick and thorough. For 100 ft on either side of a nearby residence, the duration of a trench opening would be limited to contractor working hours.

SESH proposes using specialized methods such as drag section and/or stovepipe construction techniques, as necessary, to minimize impacts to residences. Both techniques would substantially reduce workspace requirements. Drag section construction would involve welding two or more joints of pipe together in an area away from a residence and then transporting the joined pipe into the right-of-way for installation. This would minimize the amount of time that residential property would be disturbed. Stovepipe construction, which is generally best suited for situations where the available workspace is extremely limited, would involve installing one or two joints of pipe at a time. The pipeline ditch would be dug just ahead of construction. One or two joints of pipe are carried into place, lowered into the ditch, and welded. The ditch would be immediately backfilled before the next section of ditch is excavated. While stovepipe construction would significantly reduce the amount of property disturbed at any one time, it tends to be slower and more expensive than other construction techniques.

Homeowners would be notified in advance of nearby construction activities and any scheduled disruption of household utilities. Should any proposed Project-related work activity in a residential area disrupt landowner ingress to or egress from his or her residence, SESH would offer to temporarily relocate the landowner and provide a meal allowance.

SESH would attempt to leave mature trees and landscaping intact within the construction right-of-way unless the trees and landscaping interfere with the installation techniques or present unsafe working conditions. Fences, mailboxes, and other structures that have been removed would be restored. Sidewalks, driveways, and roads would be restored as soon as practical. After cleanup, a SESH representative would contact landowners to ensure that conditions of all agreements have been met.

2.3.2.4 Active Croplands

Agricultural areas along the proposed Project route include pasture areas used for livestock grazing, hayfields, fallow fields, and rotated croplands, such as cotton and corn. In these areas, SESH would implement special procedures to minimize impacts on current agricultural uses in accordance with SESH's Plan and Procedures. Topsoil would be removed to its actual depth, up to a maximum of 12 inches, and stockpiled separately from the subsoil excavated from the pipeline trench. Typically, topsoil would be stripped from the area directly over the pipeline ditch and the adjacent subsoil spoil storage area (see Figure 2.3.1-2); however, landowners would be provided with the option of topsoil segregation across the full construction work area. During construction, the natural flow patterns of all fields would be maintained by providing breaks in topsoil and subsoil stockpiles.

During cleanup and restoration, all disturbed areas would be finish-graded and restored as closely as possible to preconstruction contours. Topsoil previously segregated from the trench material in all agricultural and residential areas would be spread uniformly across the construction right-of-way, and any excess rock would be removed from at least the top 12 inches of soil. The topsoil and subsoil in all agricultural areas would also be tested for compaction at regular intervals using penetrometers or other appropriate devices. Any severely compacted areas would be plowed with a paraplow or other deep-tillage device. In areas where the topsoil was segregated, the subsoil would be plowed before replacing the segregated topsoil.

SESH indicates that no known drainage structures or irrigation facilities would be crossed by the proposed Project. SESH would work with landowners prior to construction to establish compensation agreements for crop damages and for loss of growing time, as applicable. Additional information on special procedures used in agricultural areas is presented in Sections 3.2 and 3.8.

Table 3.8.1-1 provides the cumulative total active cropland (i.e., agricultural lands in active rotation including permanent or rotated cropland, hayfields, and improved pastures) crossed by the proposed Project.

Specialized construction methods to be used in active croplands are discussed in SESH's Plan and Procedures. Typical steps in pipeline construction in active croplands are discussed below.

Grading

Topsoil would be stripped as appropriate (full width or trench plus spoil side) and segregated from excavated subsoil. Subsoil could be stored either on subsoil in defined storage areas or on the natural ground surface if a recognizable, biodegradable vegetative layer either exists or is emplaced prior to subsoil placement. Natural drainage patterns would be maintained by providing breaks in topsoil and subsoil stockpiles.

Drain Tiles

There are no known areas of drain tiles in the proposed Project area.

Restoration and Revegetation

Restoration and revegetation practices follow those described in SESH's Plan and Procedures. Any rutting or compaction would be repaired prior to revegetation of disturbed areas. All rocks larger than, or in higher densities than, those in adjacent undisturbed areas would be collected and properly disposed.

2.3.2.5 Road Crossings

All roadways crossed by the proposed Project are listed in application filing to FERC. A table in the filing identifies the crossing by MP, roadway name, surface type, jurisdiction, and anticipated method of crossing. Specialized construction methods to be used at roadway crossings are discussed in detail in SESH's Plan and Procedures.

Prior to any excavation, all utility companies with underground facilities that might be affected by trenching or other excavation activities would be alerted via the "One Call" system. Representatives of the utility companies would then visit the site and mark their facilities within the construction work area so the excavation can proceed with relative certainty regarding the location of underground lines. Where there is a question as to the location of a utility, such as a water, cable, gas, or sewer line, it would be located by field instrumentation and/or excavation of test pits.

During the crossing of residential streets by the open-cut method, every attempt would be made to keep at least one lane of traffic open. During the brief period when a road may be completely cut, steel plates would be available on-site to cover the open area to permit travel by emergency vehicles.

Generally, boring or HDD would be required under major arterial roadways. HDD is discussed in Section 2.3.2.1. Boring would entail drilling a shaft below the roadway through which the pipeline crosses. First, a bore pit would be excavated on one side of the artery and a receiving pit would be excavated on the other side. These pits would be excavated to a depth equal to the bottom of the pipe to be emplaced, and the bore pit would be graded such that the bore follows the grade of the pipe. A boring machine would be lowered to the bottom of the bore pit and placed on supports. The machine would cut a shaft under the artery using a cutting head mounted on an auger. The auger would rotate in a casing, both of which would be pushed forward as the hole is cut. Once the shaft is complete, the auger would be removed and the pipeline would be pushed through the casing. The casing would be removed and the area between the pipeline and the shaft would be grouted as required by permit.

There would likely be little disruption of traffic on roads and railways that are bored. Section 3.8 provides additional information on the proposed major road crossing locations. Pipeline crossings of lightly-traveled, paved and unimproved rural dirt roads would typically be crossed via open-cut installation. Such crossings would require the temporary closure of these roads and implementation of detours where feasible. In the absence of a reasonable detour, construction across the roadway would be staged to allow at least one lane of traffic to remain open except for the limited periods required for installing the pipeline. Efforts would be made to schedule lane closures outside of peak traffic periods. Attempts would be made to avoid peak-traffic periods on all road construction. All construction operations at these crossings, including repair and surface restoration, would normally be completed within one day.

Three minor road crossings, Highway 577 Road (MP 4.2), Quebec Road (MP 10.9), and Carlisle Land (MP 55.7), would be accomplished via HDDs associated with the crossing of adjacent waterbody features.

2.3.2.6 Rock Removal and Blasting

SESH does not anticipate encountering solid bedrock during pipeline construction; therefore, there should be no blasting or excess rock.

2.3.2.7 Steep Vertical and Side Slopes

Additional grading could 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 slope would be cut away and, after the pipeline is installed, reconstructed to its original contours.

In areas where the alignment runs along the side of a slope additional grading could be required. Generally, on steep side slopes, soil from the high side of the right-of-way would be moved to the low side to create a safe and level terrace. See Figure 2.3.2-2 for an illustration of typical side slope (two-tone) construction widths in steep terrain. 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 original contours of the slope would be restored.

The two-tone construction technique would likely require ATWS areas to accommodate the additional volumes of fill material generated by this technique. Following pipeline installation and backfill of the trench, excavated material would be placed back in the cut and compacted to restore the approximate original contours. All disturbed areas would then be stabilized in accordance with SESH's Plan and Procedures.

2.3.3 Aboveground Facilities Construction Procedures

The aboveground facilities would be constructed concurrent with pipeline installation, but construction would be conducted by special fabrication crews generally working separately from the pipeline construction spreads.

Construction of the compressor stations would involve clearing, grading, and compacting the sites to the surveyed elevations, where necessary, for placement of concrete foundations for buildings and to support skid-mounted equipment. Prefabricated segments of pipe, valves, fittings, and flanges would be

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Section 2.3.2
Figure 2.3.2-2
Typical Side Slope Construction Widths in Steep Terrain

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shop- or site-welded and assembled at the compressor station site. The compressor units and other large equipment would be mounted on their respective foundations, and the compressor enclosures would be erected around them. Noise abatement equipment (including sound-attenuating enclosures around the turbines, exhaust stack silencers, and air inlet silencers) and emission control technology would be installed as needed to meet applicable federal, state, and/or local standards. Section 3.11 provides additional information on noise-abatement and emission-control technology. As necessary, electrical, domestic water and septic, and communications utilities would be installed.

Facility piping, both aboveground and belowground, would be installed and hydrostatically tested before being placed in service. Controls and safety devices such as the emergency shutdown system, relief valves, gas- and fire-detection facilities, and other protection and safety devices would also be checked and tested. Upon completion of construction, all disturbed areas associated with the aboveground facilities would be finish-graded and seeded or covered with gravel, as appropriate. All roads and parking areas would be graveled. Additionally, the compressor station sites would be fenced for security and protection.

Construction of M&R stations, mainline valves, and pig launcher/receiver facilities, not collocated with the compressor stations, would generally be similar to that described above for compressor station sites and would entail site clearing and grading, installation and erection of facilities, hydrostatic pressure testing, cleanup and stabilization, and installation of security fencing around the facilities.

2.4 CONSTRUCTION SCHEDULE

SESH proposes to commence construction of the proposed Project in November 2007 with an anticipated in-service date of June 2008. The duration of construction for all facilities combined would be approximately 6 months with all spreads and aboveground facilities being constructed concurrently.

2.5 ENVIRONMENTAL TRAINING AND MONITORING

SESH would conduct environmental training for all company and construction contractor personnel prior to and during construction activities. Such training would focus on implementation of SESH's Plan and Procedures, but would also address Project-specific permit requirements, company policy and commitments, any protection procedures and restrictions associated with cultural resources or sensitive species/habitats, and any other pertinent job-related information.

During Project construction, EIs would be responsible for monitoring and ensuring compliance with all environmental mitigation measures required by the FERC Certificate, if granted, and SESH's Plan and Procedures. The EIs would have the authority to stop activities that violate the environmental conditions of these authorizations, state and federal environmental permit conditions, or landowner requirements, and order appropriate corrective actions if needed. SESH has indicated that it would be represented by at least one EI per construction spread. However, the number and experience of EIs assigned to each construction spread should be appropriate for the length of the construction spread and the number and significance of resources affected. If the Project were authorized, SESH would be required to develop and submit an implementation plan for our approval prior to construction. During our review of the Implementation Plan, we would consider the absolute number and qualifications of the EI personnel proposed by SESH.

In addition to the EI personnel specified above, we believe that SESH's implementation of the third-party independent Environmental Compliance Monitoring and Reporting (ECMR) Program would provide a number of benefits, both to us and to SESH, if the proposed Project is certificated. The overall objective of an ECMR Program would be twofold: to assess environmental compliance during construction in order to achieve a high level of environmental compliance throughout the Project, and to assist us in the screening and processing variance requests during construction. Therefore, **we recommend:**

- **SESH should hire and fund a third-party contractor, to work under the direction of the Commission staff, for the sole purpose of monitoring compliance with the environmental conditions attached to the Order for the project, including all measures proposed by SESH. A draft monitoring program should be developed by SESH and filed with the Commission for review and approval of the Director of OEP, along with a proposal from potential contractors that will be available to provide the monitoring and reporting services. The monitoring program should include the following elements:**
  - **a. the employment by the contractor of one to two full-time, on-site monitors per construction spread;**
  - **b. the employment by the contractor of a full-time compliance manager to direct and coordinate with the monitors, manage the reporting systems, and provide technical support to the Commission staff;**
  - **c. a systematic strategy for the review and approval by the contract compliance manager and monitors of variances to certain construction activities as may be required based on site-specific field conditions;**
  - **d. the development of an Internet web site for the posting of daily or weekly inspection reports submitted by both the third-party monitors and environmental inspectors; and**
  - **e. a discussion of how the monitoring program could incorporate and/or be coordinated with the monitoring or reporting that may be required by other Federal and state agencies.**

SESH established an Internet website (http://www.spectraenergy.com/businesses/projects/sesh/) and toll-free telephone number (1-888-312-7374) to provide potentially affected landowners and stakeholders with a venue for providing comments or requesting additional information about the proposed Project. The FERC staff is interested in ensuring that landowner issues are resolved in an effective and timely manner. Therefore, we encourage SESH to continue its commitment to maintain open communications with affected landowners during construction through similar methods should the Project ultimately be certificated.

2.6 OPERATION, MAINTENANCE, AND SAFETY CONTROLS

The proposed Project pipeline and aboveground facilities would be designed, constructed, operated, and maintained to meet or exceed all safety standards as set forth in the DOT's "Transportation of Natural and Other Gas By Pipeline: Minimum Federal Safety Standards" (49 CFR Part 192). These safety standards are discussed further in Section 3.12.

The pipeline would be constructed of welded carbon steel that meets or exceeds industry standards and would be covered with a protective epoxy coating to minimize rust and corrosion. To protect against damage from external forces, the proposed pipeline would be buried at a minimum depth of 3 ft below ground surface. All welds joining each section of pipe would be visually inspected and x-rayed to ensure the integrity of the welds. Prior to being placed in service, the pipeline would be hydrostatically pressure tested to verify its integrity and to ensure its ability to withstand the MAOP. A cathodic protection system would be installed to protect all underground and submerged pipeline facilities constructed of metallic materials from external, internal, and atmospheric corrosion.

During operations, SESH would conduct regular patrols of the pipeline right-of-way in accordance with the requirements of 49 CFR Part 192. The patrol program would include periodic aerial and vehicle patrols of the pipeline facilities. These patrols would be conducted to survey surface conditions on and adjacent to the pipeline right-of-way for evidence of leaks, unauthorized excavation activities, erosion and washout areas, areas of sparse vegetation, damage to permanent erosion control devices, exposed pipe, and other conditions that might affect the safety or operation of the pipeline. The cathodic protection system would also be inspected periodically to ensure that it is functioning properly. In addition, intelligent pigs would regularly be sent through the pipeline to check for corrosion and irregularities in the pipe. SESH would keep detailed records of all inspections and supplement the corrosion protection system as necessary to meet the requirements of 49 CFR Part 192.

Routine operation and maintenance would be performed at all aboveground facilities by qualified personnel. SESH would maintain safety equipment, such as pressure-relief devices, fire-detection and fire-suppression systems, and gas-detection systems, throughout the life of each facility. In addition, SESH would inspect, service, and test mainline valves to ensure proper functioning.

SESH would establish and maintain a liaison with the appropriate fire, police, and public officials. This program would identify the available resources and responsibilities of each organization that may respond to a natural gas pipeline emergency and assist in developing coordination responsibilities.

SESH would place and maintain pipeline markers along the right-of-way at roadway crossings, railroad crossings, and other highly visible places to alert those contemplating working near the buried pipeline. The markers would identify SESH as the operator and display telephone numbers to call if any abnormal conditions are detected.

SESH would also participate in the “One-Call” program. This program provides telephone numbers for excavation contractors to call prior to commencing any excavation activities. The One-Call operator would notify SESH of any planned excavation near the pipeline so that SESH could flag the location of the pipeline and assign staff to monitor activities, if required.

SESH would perform vegetation-management procedures during operation in accordance with their Plan and Procedures, which would include regular mowing, cutting, and trimming along most of the 50-ft-wide permanent pipeline right-of-way, except in wetland resource areas, where only an area up to 30 ft wide would be maintained. Routine vegetative maintenance clearing would not be performed more frequently than every 3 years, unless requested and approved by appropriate state and local agencies. However, a corridor, not exceeding 10 ft wide, centered on the pipeline, could be maintained annually in an herbaceous state, as required to facilitate periodic corrosion and leak detection surveys. In addition, SESH has indicated that routine vegetation maintenance would not occur between April 15 and August 1 of any year to minimize the potential for impacts on migratory bird species that may use the permanent right-of-way for nesting. Vegetation management is discussed further in Section 3.5.

2.7 FUTURE PLANS AND ABANDONMENT

SESH currently has no plans for future expansion of the facilities proposed. However, the design of the SESH Project includes two taps located at MP 195.27 and MP 250.40 to accommodate potential future interconnects with certain power generation facilities. If additional demand for natural gas supplies requires future expansion, SESH would seek the appropriate authorizations from the FERC. When and if an application is filed, the environmental impact of the new proposal would be examined at that time.

Abandonment of the pipeline facilities would be subject to the approval of the FERC under Section 7(b) of the NGA and would comply with DOT regulations and specific agreements or stipulations made for the pipeline rights-of-way.